BAUSCH & LOMB OPTICAL CO.

MANUFACTURERS

MICROSCOPES, MICROTOMES,
PHOTO-MICROGRAPHIC APPARATUS,
AND LABORATORY APPARATUS.

ROCHESTER, N. Y.

NEW YORK CITY

Microscopes,

Microtomes,

APPARATUS FOR

Photo-Micrography,

AND

Bacteriology.

Laboratory Supplies.

Bausch & Lomb Optical Co.

Manufactory and Executive Office:
515-543 North St. Paul Street,
ROCHESTER, N. Y.

Branch Office and Warerooms:
Fulton Building, 130 Fulton Street,
NEW YORK CITY.

FIFTEENTH EDITION.

E. R. ANDREWS' PRINT, ROCHESTER.

ERRATA.

PAGE 21, line 26, read—attachment No. 1495 instead of No. 1485.
PAGE 23, line 11, read—attachment No. 1495 instead of No. 1485.
PAGE 24, line 8, read—attachment No. 1495 instead of No. 1485.
PAGE 77, price of objective No. 1128 should be $36.00 instead of $30.00.
PAGE 79, under "Tube Length 160.0 mm. the second left-hand column should be headed 1⅝ in. instead of ⅛ in.
PAGE 90, figure of triple nosepiece should be numbered 1510 instead of 1550. Marginal number of triple nosepiece, nickeled, should be 1510 instead of 1515. Triple arm for lenses should be 1530 instead of 1535 and triple revolving lens carrier should be 1535 instead of 1540.
PAGE 96, No. 1740 should read Hæmaglobinometer after Gowers instead of *Hæmacytometer* after Gowers.
PAGE 97, last line, the ⅔ *inch* objective is meant instead of the ⅔ mm.
PAGE 156, No. 3390 should be—same or No. 3380, instead of "same as No. 3370."
PAGE 167, No. 3552 should be 200 mm. diameter instead of 100 mm. diameter.
PAGE 178, figure 3875 should be 3880, and figure 3880 should be 3875.
PAGE 183, Sizes of Stender dishes should be as follows:

	A	B	C	D
Heighth,	90	35	30	24 mm.
Diameter,	60	60	50	36 mm.

PAGE 189, No. 4401 should read, sizes 1, 2, 3, 4, 5, instead of 1, 3, 4, 5.
PAGE 207, No. 5780 should read, Bone forceps, steel, nickeled, *curved blades*, instead of straight blades.

	100 cc.	250 cc.	500 cc.
PAGE 221, No. 7775 should read, Ether, sulphuric, pure, sp. gr., 0.722,	$ .40	.60	.90

TERMS.

In writing, specify letters, catalogue numbers, and give such other description as may be necessary to prevent any misunderstanding of the order.

We send any of the articles herein enumerated for examination. Parties unknown to us will please remit full amount with order. When goods are returned in good condition, money will be refunded without deduction, express charges both ways to be borne by the purchaser.

Satisfactory references are required to open credit accounts, otherwise remittance should accompany order. Remit by Post-Office Order, Express Order or New York Draft made payable to us. Checks drawn on banks other than New York, Boston or Philadelphia are subject to collection charges of 15 cents for amounts less than one hundred dollars, or one eighth of one per cent for amounts more than one hundred dollars, and this amount should be added to the remittance.

Goods will be sent by express C. O. D. only when amounting to more than $5.00, expense of collection and return charges to be borne by purchaser. One-fourth of total amount should accompany order.

Goods ordered to be sent by mail are at purchaser's risk. As a matter of safety we insure all packages by open mail amounting to from $2.50 to $5.00, at a cost to the purchaser of 5 cents. Packages of greater value are sent either registered, or under sealed mail, at the expense of the buyer.

Correspondents are requested to give exact address and explicit shipping directions.

We make no charge for packing.

We assume responsibility for all goods sent by Express during transportation, and rectify any damages which may occur, under the following conditions:

That all goods when received be unpacked in the presence of the expressman delivering them, and under no circumstances accepted if they are found to be faulty. Notification to this effect is plainly marked on each package.

Glassware is sent only at the risk of the purchaser.

We employ only experienced packers and use every precaution to prevent breakage.

Freight should be used as little as possible for any of our goods. Shipments so ordered will be most carefully packed, but are without redress at the risk of the purchaser. Our liability ceases when the goods are delivered on board of cars here after receipt for same in good order has been taken. Such consignments, however, can be insured against damages, if ordered at carrier's liability, which should be plainly stated on order and packing case, and freight will then be charged at an increased rate of 20 per cent.

When goods are returned for exchange, repair or otherwise, a tag bearing sender's name and address should be attached; this should never be neglected and will avoid delays.

ANNOUNCEMENT.

By an arrangement with PROF. CHAS. S. HASTINGS of the Sheffield Scientific School of Yale University, whose achievements in the computation of telescope objectives, and high standing as a scientist are well known, and who has for several years devoted much time to the attainment of higher optical results in the microscope, which we have carried out, we are now enabled for the first time to offer a list of:

APOCHROMATIC OBJECTIVES,
COMPENSATING EYEPIECES,
APLANATIC TRIPLETS,

to a complete description of which, under their proper heads, we would call special attention.

By a contract with

CARL ZEISS, OPTISCHE WERKSTAETTE, JENA,

we are sole licensees for the United States of the Zeiss Anastigmat and other photographic productions, being supplied by them with all necessary data, using the same combinations of glass, and selling under the same prices.

We also issue a

PHOTOGRAPHIC CATALOGUE,

containing a list of different series of Zeiss Anastigmat, Extra Rapid Universal, Rapid Universal and Alvan G. Clark Lenses, Diaphragm and Stereoscopic Shutters, Prisms, etc., which we will be pleased to send gratis to any address.

IMPORTANT FACTS.

In presenting these, our latest microscopes, we do so with the assurance that they represent the *most recent improvements* in optical and mechanical science, and that they meet the requirements which the recent rapid advancement in laboratory methods and the opening of many new fields of scientific investigation have made upon the manufacturer of optical instruments.

With this issue of our catalogue we have

MADE AND SOLD 18,000 COMPOUND MICROSCOPES,

not including the

Thousands of Dissecting Microscopes.

1,300 LABORATORY MICROTOMES,

Exclusive of the many hand microtomes.

It may be of interest to our friends to know that since the issue of our last catalogue, *very extensive additions* to the working force, and an almost entire *re-modeling of the methods* of manufacture have been accomplished. Wherever practicable, special machinery, devised and built at our works, has been applied. There is probably now no optical establishment in the world which has such a quantity of precise and delicate tools. Adjunct to these, we employ a class of mechanics of superior accomplishments and who are especially educated for their particular work.

Our instruments are in daily use in almost all the laboratories of colleges and educational institutions. They are used in the various departments of the Government; in public and private hospitals, and by the most eminent practitioners and individual microscopists throughout the country. The list of institutions using our microscopes is an interesting one and will be forwarded on application.

Advantages of buying American microscopes.—The microscopes listed in this catalogue are the result of suggestions from American investigators and, as it is our aim to make the workmanship *at least* equal to that of the best European or other makers,—we believe our microscopes best calculated to meet the requirements of American laboratories and individuals.

There are many advantages in purchasing American instruments, among which we enumerate the following:

We keep on hand a stock of the apparatus listed.—While the constantly increasing demand for our products makes it difficult to have at all times a sufficiently large stock to meet every demand, we have so increased the capacity of our works that we are ordinarily in position to fill all orders promptly. This will be appreciated as a convenience by those who have been subjected to the delays incident to ordering from abroad.

Our prices are as low as those of any of our foreign competitors, and this fact, when the value given in optical and mechanical excellence and the absolute maintenance of a high standard of workmanship is considered, entitles us to the claim of giving more value for the same amount of money.

We guarantee our instruments free from optical or mechanical defects. As every piece of apparatus is produced under our personal supervision and carefully inspected and tested before shipment, it is almost impossible for faulty work to pass unnoticed, but in a business so extensive as ours this may occasionally occur. In such cases we cheerfully remedy any defects at our expense.

We assume all risk in transportation.—Where damage occurs we either repair the same free of charge, or replace the instrument by a new one, subject to conditions in **Terms** (Page 3).

Repairs in cases of accidents are quickly and cheaply made on our instruments, all parts being made to gauge and duplicates kept in stock. This is particularly true of objectives. To accommodate our customers we are daily making repairs on foreign objectives, the cost of such repairs being of course necessarily higher. However, in serious cases it often occurs that the repairs should be made by the maker only, which of course means the loss of the use of the article for several months. We charge for repairs on our own products only enough to cover the cost of labor and material.

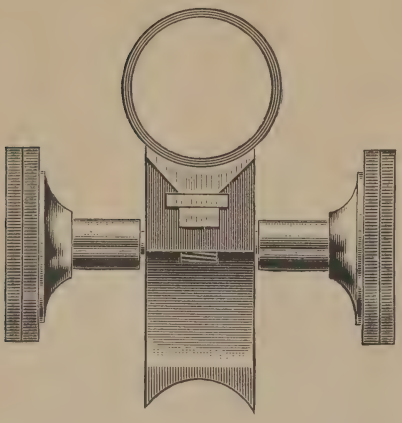
We make exchanges of our products.—While never profitable we wish to accommodate the buyers of our instruments and therefore offer, when any piece of apparatus is found unsuitable for the work for which it was purchased, to accept it back in exchange for other apparatus of at least the same value, provided that the articles returned conform to current catalogue, and that we be remunerated for putting them in saleable condition and that transportation charges be paid on them.

Cloth lining.—All stands, except the cheaper forms (A, AA, AAB, AABS, D, DD), are provided with graduated nickeled draw tubes sliding in cloth-lined sleeve tube. The graduations are in millimeters. The cloth-lining has been used on our microscopes for the past nine years, and has proven extremely satisfactory. The movement, while firm, is very agreeable to the touch, being free from the harshness of metallic bearings, and is permanent.

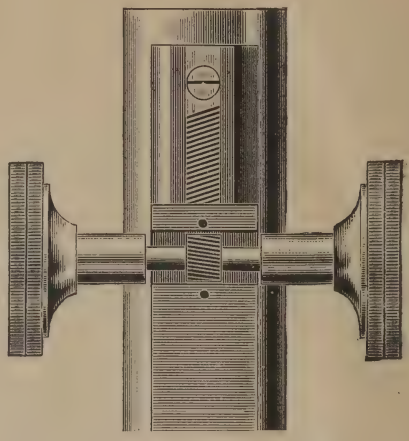
Rounded corners.—We have introduced the innovation of rounding corners, as far as practicable, in all apparatus. This is generally conceded to be an important improvement as it increases the convenience of handling the various parts, and removes the liability of injury to the hands, especially when using the microtomes.

We offer a larger variety of microscopes than any other manufacturer in the world. We list thirty-one different compound microscope stands and twelve dissecting microscopes. This variety is offered in order to meet all the requirements of the various classes of workers. Every instrument offers advantages over the others, either in price, or its adaptation to special work, and many of the forms will not be found in the catalogues of other makers.

Hard rubber stage plates where furnished are vulcanized into the metal of the stages, forming a perfect union, thus precluding the possibility of warping, common to other modes of attaching. These stages are especially valuable, as they are not in any way affected by the re-agents used in the laboratory.



Cross Section of Coarse Adjustment showing arrangement of bearing surfaces.



Diagonal Rack and Pinion used in Coarse Adjustment and in substage construction.

Fine adjustment deserves special mention as it represents the highest degree of mechanical perfection now attainable. Our frictionless adjustment is retained in a number of the American type microscopes. In the Continental forms the micrometer screw acts directly on the triangular bearing of the arm. The weight of the body is balanced by a suitable spring and the screw thus subjected to the minimum strain. Lateral motion is eliminated by an original device which does away with set screws and springs, and the consequent liability to relaxation and wear.

Sliding parts and Rack and Pinion.—The diagonal rack and pinion, is used in the coarse adjustment of all of our microscopes. We have built special automatic machines for cutting the rack and pinion which insure extremely accurate results. We have also made important advances in the construction of the sliding parts of the coarse and fine adjustments, having devised special machinery for accurately cutting the surfaces, permitting the hand fitting to be accomplished with an exactness before impossible. Especial emphasis is laid on the *form* of the bearing surfaces as shown in the cut above. The surfaces on the tube are made on a separate piece of metal attached to the body tube. This method is still exclusively used by us, and while more expensive to make than the older forms, it is mechanically more perfect, admitting a higher degree of rigidity, with accuracy and ease of movement. The pinion box is provided with a tension for taking up any possible wear.

New Dissecting Microscopes and Lenses are added to the list, completing the series with both simpler and more complex stands. The simple lens stands and Bruecke Lenses are especially adapted to the new laboratory courses. The Complete Dissecting Microscope, which is a modification of the Paul Meyer pattern, embodies every feature necessary for even the most advanced work.

Improvements in microtomes.—While constructed on the same general lines as those formerly listed, radical improvements and additions have been made to secure a higher degree of accuracy and convenience, so that we feel confident of their meeting every requirement for the finest work.

The bacteriological apparatus described and listed is all of the very highest grade. With our improved Incubators, Sterilizers, Ovens, Water-baths, etc., and increased stock of other articles used in bacteriological work, we are prepared to fully equip a Bacteriological Laboratory of any size and at short notice.

The department of general laboratory supplies and material has also been largely increased, and such articles as the developments of the past two years have brought forth, added to the list.

Import orders for such material as we do not ourselves manufacture are solicited, including Physiological, Physical, Chemical or any other line of scientific apparatus. We have our own purchasing agents abroad, and can, therefore, secure for our customers very advantageous rates. Entry free of duty will be made of all articles for educational institutions entitled to such entry.

Suggestions are respectfully requested regarding new and useful apparatus, or regarding improvements in apparatus which we now manufacture. We have often been requested to furnish estimates on the construction of apparatus for physiological and other work, but have heretofore not taken this work in hand, as we have been so fully occupied with improvements on our microscopes. We are now ready to undertake the manufacture of such laboratory instruments as may be required.

GENERAL INFORMATION REGARDING MICROSCOPES.

We manufacture two types of microscopes—the **American** type, developed by us from the Jackson model, and the **Continental** type, originated by Oberhaeuser.

The American type is largely preferred for individual use on account of its many conveniences and adaptibility to every kind of work, graceful appearance and elegant finish. A special feature of this type is the hanging of the mirror-bar, which permits the illumination of objects above the stage.

The objectives and eyepieces listed with this type are corrected for the tube length of 8.5 inches.

The objectives are of Series II., unless otherwise stated.

The eyepieces are of the Huyghenian type.

The Continental type was first introduced into our lists in 1889 with one form. Since then our efforts have been directed toward adapting this type to the needs of the American laboratory workers and users of microscopes. We have made a steady increase in the number of patterns, and the excellence of workmanship until we now offer Continental Microscopes for every class of work.

The heavy and substantial construction of these stands recommends them especially for laboratory work, or where hard and continuous wear is expected. The low and compact form makes them easy to use in the vertical position.

The objectives and eyepieces listed with the Continental Microscopes are corrected for tube length of 160 mm.

The objectives are of Series I.

The eyepieces are of the Huyghenian type in Continental mountings.

The micrometer screw threads of all stands are 0.5 mm. pitch, and where the head is graduated the circumference is divided into 100 parts. One complete revolution of the screw head would, therefore, raise or lower the objective through 0.5 mm., and revolution through one division of the screw head would move the objective 0.005 mm. These facts may be utilized for measuring the thickness of objects under the microscope, first focusing the objective sharply on the *upper* surface of the object, then noting the rotation required to bring the bottom surface sharply in view. While the results thus obtained are not absolutely accurate, they are sufficiently so to be of considerable convenience.

Tube length is measured from the top of the draw tube to the bottom of the collar, into which the objective is screwed. This distance can be read directly on all our stands having graduated tubes. Where the nosepiece is added, the tube length must be taken from the top of the draw tube to the shoulder of the nosepiece, against which the objective is screwed.

Equipments.—In listing the various equipments we have included in the most complete outfit, the highest powers of objectives and eyepieces, which we believe it advisable to use with the stand indicated. Any others may be selected, however, if desired.

In the optical equipments listed, where reference is made to one eyepiece, we send the 1½ inch, and where two are quoted, the 2 inch and 1 inch. Where three are listed, the 2 inch, 1½ inch and 1 inch, and where four are included, the 2 inch, 1½ inch, 1 inch and ⅝ inch, unless otherwise requested.

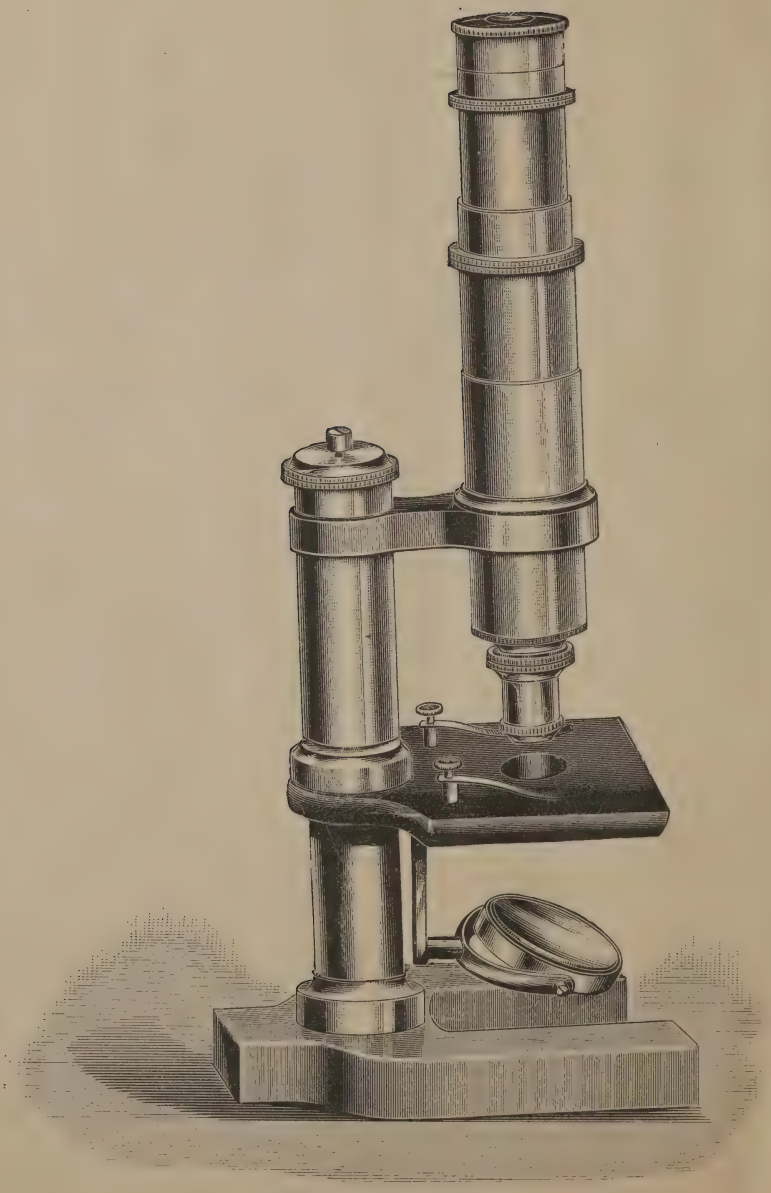
Where the Abbe Condenser is made a part of the outfit, that of N. A. 1.20 is supplied, but the three system condenser of N. A. 1.42 will be substituted for the difference in price.

Cases.—All of our Compound Microscopes are furnished in well made cases of highly finished cherry wood and with paneled door. The handles are of neat design and nickeled. A lock is also provided, except in the case of the Library and cheaper Dissecting Microscopes. The case is of such size as to receive the instrument with the triple nosepiece and objectives attached. Receptacles are provided in the case for objectives and eyepieces, and when ordered with the instrument, also for Abbe Camera Lucida, Condenser and Iris Diaphragm.

Binocular bodies can be fitted to any of our microscopes when desired, but are made only on positive order. In ordering Binocular Microscopes, the pupillary distance of the user should always be given as the best optical results cannot be obtained otherwise.

A copy of Manipulation of the Microscope, by Mr. Edward Bausch (third edition, bound in cloth, price 75 cents), accompanies each microscope purchased, except the Library and simple microscopes, and those sold at special rates to educational institutions, etc. In case it is desired to study the principles of the microscope before selecting an instrument, a copy of the book will be mailed on receipt of price, and we will give credit for the amount when an instrument is purchased at its full price.

Manipulation of the Microscope gives in clear and concise language all information regarding the principles, and leads to the intelligent use of the microscope. Beginning with the purpose of the microscope, the parts of the instrument are next described in detail, together with the principles involved in their construction, followed by a chapter outlining requisites for work. How to work, not only with the microscope, but with its various accessories, is supplemented by a chapter on advanced manipulation. Chapters on how to select and how to care for a microscope, contain valuable information and enable one to not only select the proper instrument for the work to be done, but to keep it in working order after it has been secured.



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A—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

A.

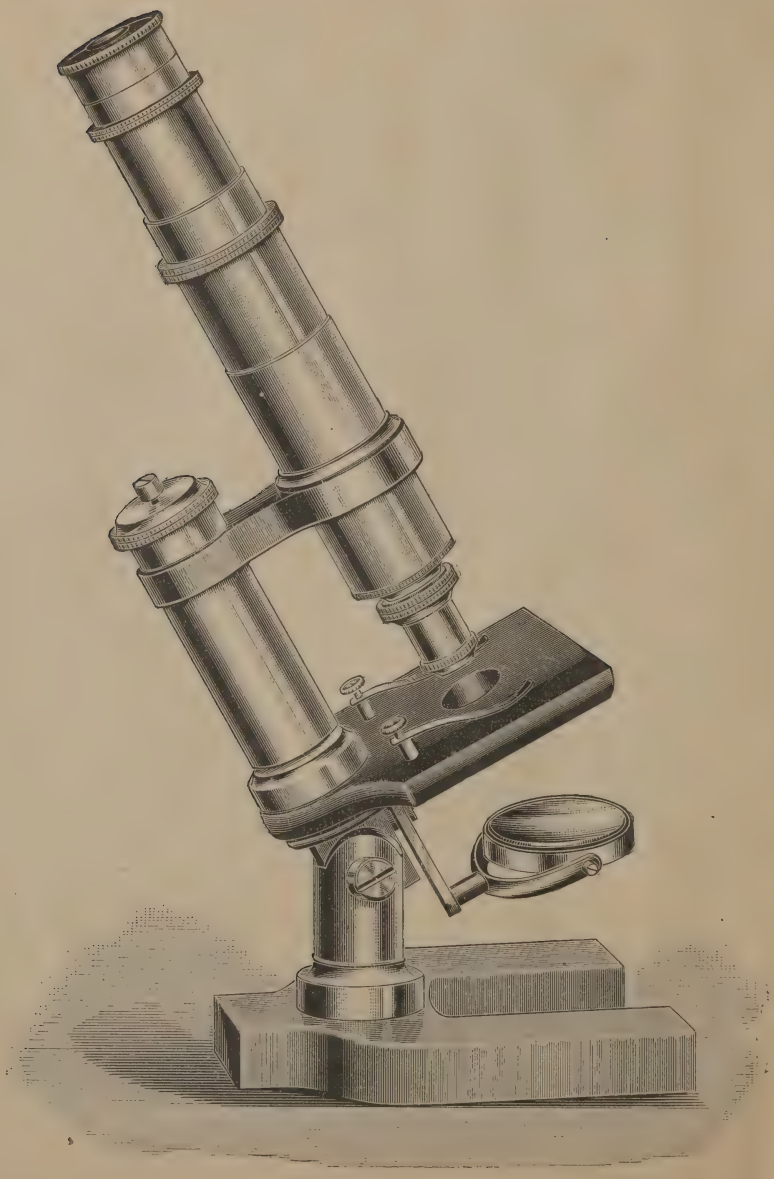
This microscope is in all respects like the AAB, with the following exceptions:

The coarse adjustment is by sliding tube as described in AA.

The joint for inclination is omitted.

We advise the use of the clamping ring, as illustrated on B stand, page 18, when using the double nosepiece. This will prevent the tubes from turning, or sliding down, in consequence of operating the nosepiece and objectives attached thereto.

A1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$30.00**
A2.	A1 and double nosepiece,	**35.00**
A3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**32.00**
A4.	A3 and double nosepiece,	**37.00**
	Clamping Ring, referred to above, extra,	**1.75**



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AA—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

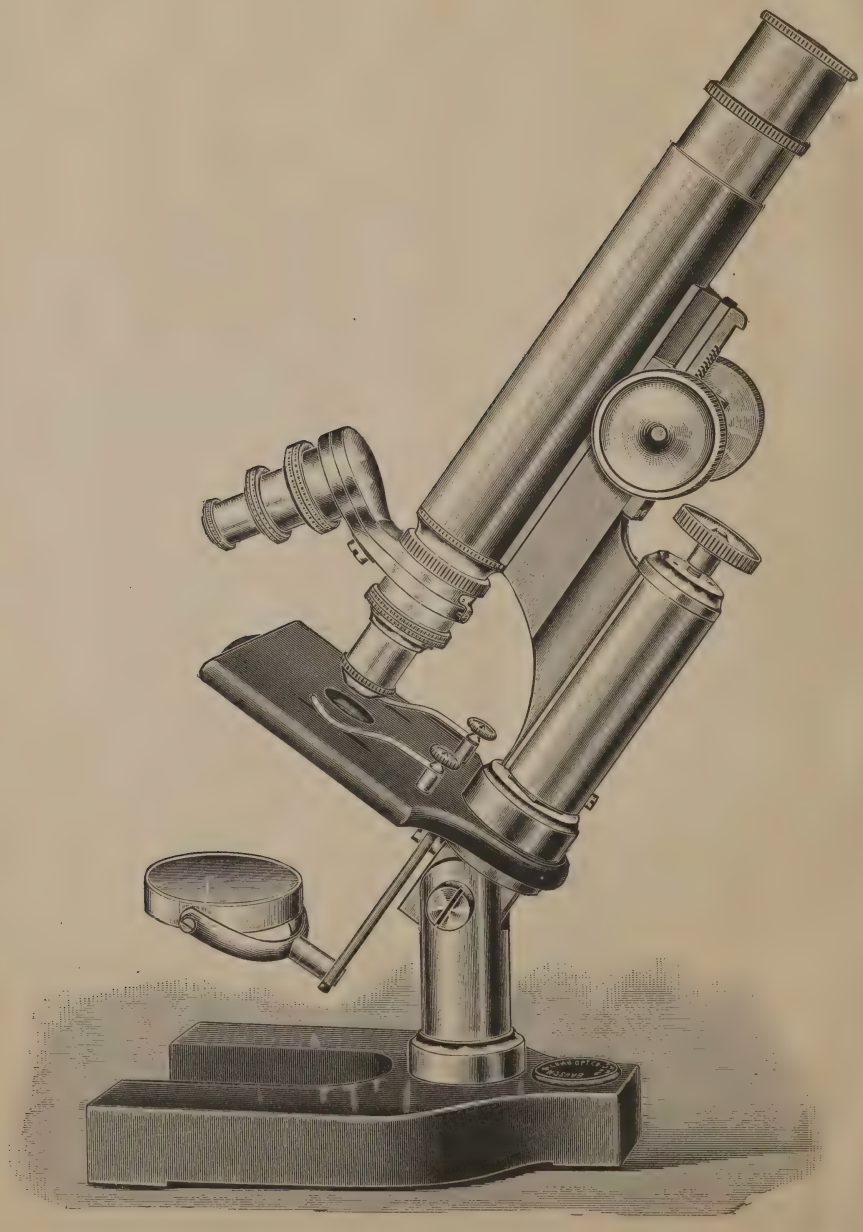
AA.

This instrument is in every respect like the AAB, with the following exception: The coarse adjustment is by a sliding tube, provided with draw tube and adjustable in a sleeve attached to the arm.

The working distance between the stage and arm is sufficient to permit the use of the nosepiece, even when watch glasses or other dishes are placed on the stage.

We advise the use of a clamping ring as illustrated on B stand, page 18, when using the double nosepiece. This will prevent the tubes from turning, or sliding down, in consequence of operating the nosepiece and objectives attached thereto.

AA1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$34.00**
AA2.	AA1 and double nosepiece,	**39.00**
AA3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**36.00**
AA4.	AA3 and double nosepiece,	**41.00**
	Clamping Ring, referred to above, extra,	**1.75**



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AAB2—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

AAB & AABS.

This microscope is of **new construction** and a modification of the A and AA, the coarse adjustment being by diagonal rack and pinion. It is believed that it will be an acceptable addition to our list, since it is the **only instrument of its type** in existence, and while particularly adapted to American requirements and a complete instrument of high grade workmanship, is simple and comparatively inexpensive. The base is made of japanned iron of the horse-shoe form with rounded corners and of ample size for stability. The pillar is of lacquered brass with joint for inclination of the body. The stage is of brass, oxydized; and with removable spring clips. The mirror bar swings to any obliquity below the stage and is provided with plane and concave mirrors. The fine adjustment is by micrometer screw, giving delicate movement. The draw tube is adjustable for tube length.

This instrument is especially recommended for High School Laboratories on account of its moderate cost, and as it meets all the requirements for the science work prescribed.

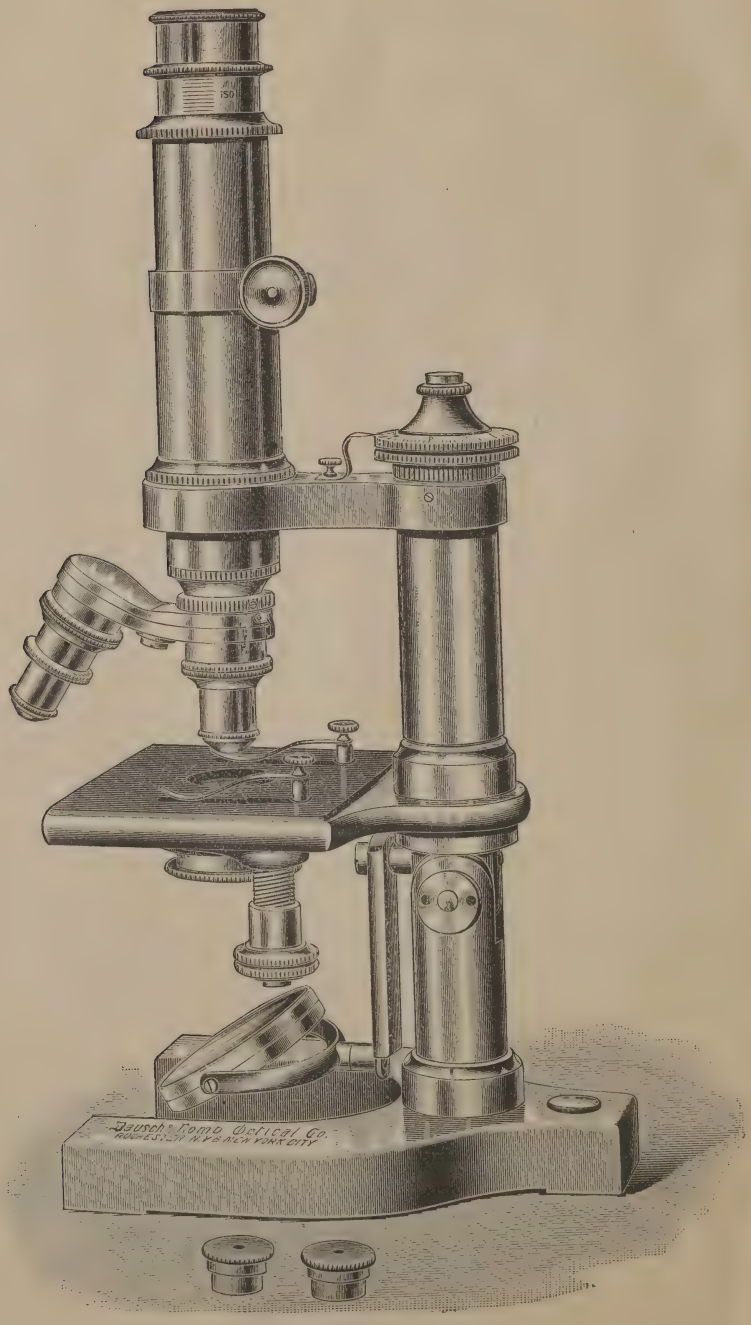
N. B.—For detailed description of coarse and fine adjustment and other parts, read Important Facts, page 8.

This microscope is supplied in two forms:

AAB. With revolving diaphragm, having apertures of four different sizes fitted on the under side of the stage.

AABS. With complete screw substage, as fitted to the BB microscope and fully described under No. 1480.

AAB1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$40.00	$37.00
AAB2.	AAB 1 and double nosepiece,	45.00	42.00
AAB3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	42.00	39.00
AAB4.	AAB 3 and double nosepiece,	47.00	44.00
AAB5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	48.00	45.00
AAB6.	AAB 5 and triple nosepiece,	55.50	52.50
AABS1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$46.00	41.00
AABS2.	AABS 1 and double nosepiece,	51.00	46.00
AABS3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	48.00	43.00
AABS4.	AABS 3 and double nosepiece,	53.00	48.00
AABS5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	54.00	49.00
AABS6.	AABS 5 and triple nosepiece,	61.50	56.50
AABS7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, and Abbe condenser in mounting with iris diaphragm,	95.00	80.50
AABS8.	AABS 7 and triple nosepiece,	102.50	88.00
	Polished wood case with beveled plate glass front, in place of one accompanying microscope, extra,	2.50	
	Revolving microscope table, with 3 drawers, adjustable for height,	10.00	
	ATTACHABLE MECHANICAL STAGE, No. 1555, easily applied to this stand, extra,	25.00	



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B 2—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

B.

This microscope is in all respects like the BB, with the following exceptions:

The coarse adjustment is by sliding tube moving in a cloth lined sleeve tube attached to the arm.

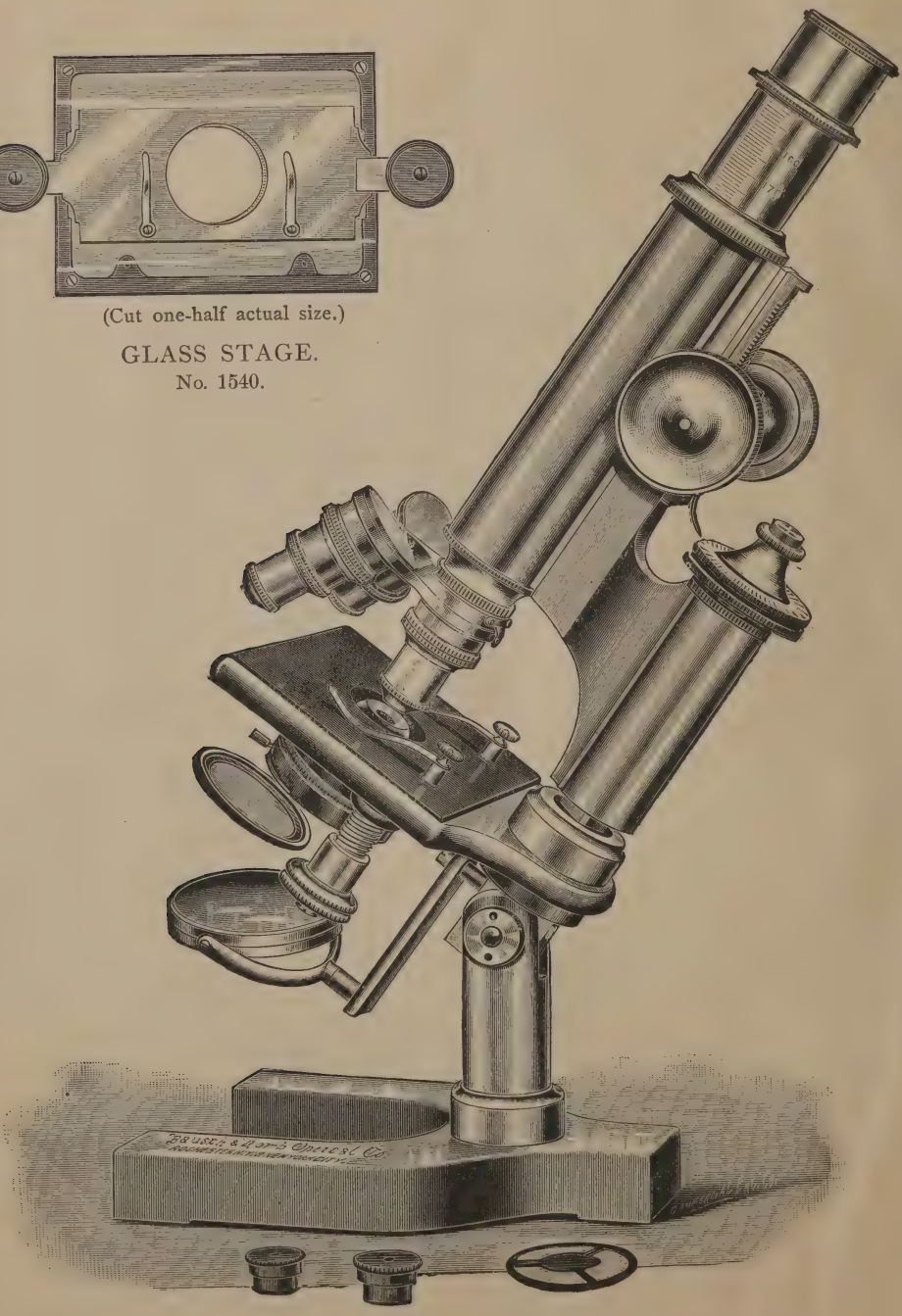
The draw tube is graduated and nickeled and slides in the cloth lined sleeve of the main tube.

When using a double or triple nosepiece on this stand we advise the use of a clamping ring as illustrated on the opposite page. This prevents the tubes from sliding down, or turning, when revolving the objectives.

B1.	With 1 eyepiece $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$44.00**
B2.	B 1 and double nosepiece,	**49.00**
B3.	With 2 eyepieces, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**46.00**
B4.	B 3 and double nosepiece,	**51.00**
	Clamping Ring, referred to above, extra,	**1.75**
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	**2.50**
	Revolving Microscope Table, with 3 drawers, adjustable for height,	**10.00**
	Glass Stage, Square, as illustrated on page 20 (Cat. No. 1540), extra,	**6.00**
	ATTACHABLE MECHANICAL STAGE, No. 1555, easily applied to this stand, extra,	**25.00**

(Cut one-half actual size.)

GLASS STAGE.
No. 1540.



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BB 8—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

BB & BBS.

This instrument is made of **brass throughout,** highly polished and lacquered. Wherever applicable, the **corners are rounded,** making the instrument pleasant to handle. The base is of unusually **large size,** with ample space for manipulating the mirror and leaded to bring the center of gravity as low as possible, thus giving **extreme stability** at any angle of inclination of the arm. The stage is **very large** with a hard rubber plate **vulcanized into its upper surface** in such a manner as to prevent warping, which is a common occurrence with plates fastened by screws. The substage is adjustable by **quick acting** delicate screw motion, and may be swung to one side when not in use. It is regularly supplied with three cylinder diaphragms of different apertures. The mirrors are plane and concave, of large size and **adjustable** to obtain the best illumination under different sources of light. The mirror bar has a **stop in the optical axis.** The joint for inclination has large bearings with tapering steel axis and steel stops to give exactly the horizontal position. Coarse adjustment is by diagonal rack and pinion, the rack being furnished with a stop to prevent jamming the pinion teeth. The fine adjustment is by micrometer screw working in a steel nut on the triangular bearing of the arm. The head of the micrometer screw is **graduated** and silvered and provided with an indicator. The draw tube is graduated to millimeters and nickel plated. It slides in the **cloth lined sleeve** of the main tube. When set at 145 mm. it gives the short standard of tube length when the double nosepiece is used.

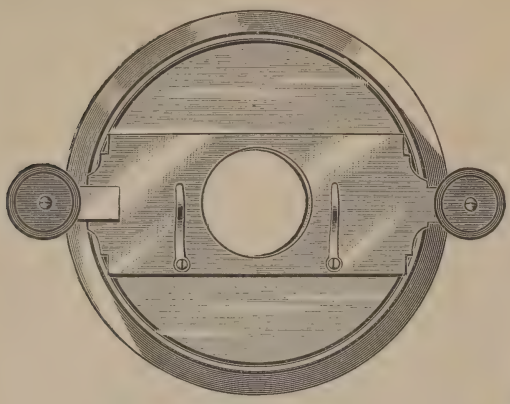
N. B.—For detailed description of coarse and fine adjustment and other parts read Important Facts, page 8.

This microscope is supplied in two forms:

BB. With complete screw substage, fully described under No. 1480.

BBS. With complete substage attachment, No. 1485, provided with rack and pinion adjustment in place of the adjustable screw substage.

BB1.	With 1 eyepiece $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$48.00
BB2.	BB 1 and double nosepiece,	53.00
BB3.	With 2 eyepieces $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	50.00
BB4.	BB 3 and double nosepiece,	55.00
BB5.	With 2 eyepieces 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	56.00
BB6.	BB 5 and triple nosepiece,	63.50
BB7.	With 2 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser in mounting with iris diaphragm,	87.50
BB8.	BB 7 and triple nosepiece,	95.00
BBS1.	With 1 eyepiece $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	63.00
BBS2.	BBS 1 and double nosepiece,	68.00
BBS3.	With 2 eyepieces $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	65.00
BBS4.	BBS 3 and double nosepiece,	70.00
BBS5.	With 2 eyepieces 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	71.00
BBS6.	BBS 5 and triple nosepiece,	78.50
BBS7.	With 2 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	102.50
BBS8.	BBS 7 and triple nosepiece,	110.00
BBS9.	With 3 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	104.50
BBS10.	BBS 9 and triple nosepiece,	112.00
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	2.50
	Revolving Microscope Table, with 3 drawers, adjustable for height,	10.00
	Glass Stage Square, as illustrated on opposite page (see Cat. No. 1540), extra,	6.00
	ATTACHABLE MECHANICAL STAGE, No. 1555, easily applied to this stand, extra,	25.00



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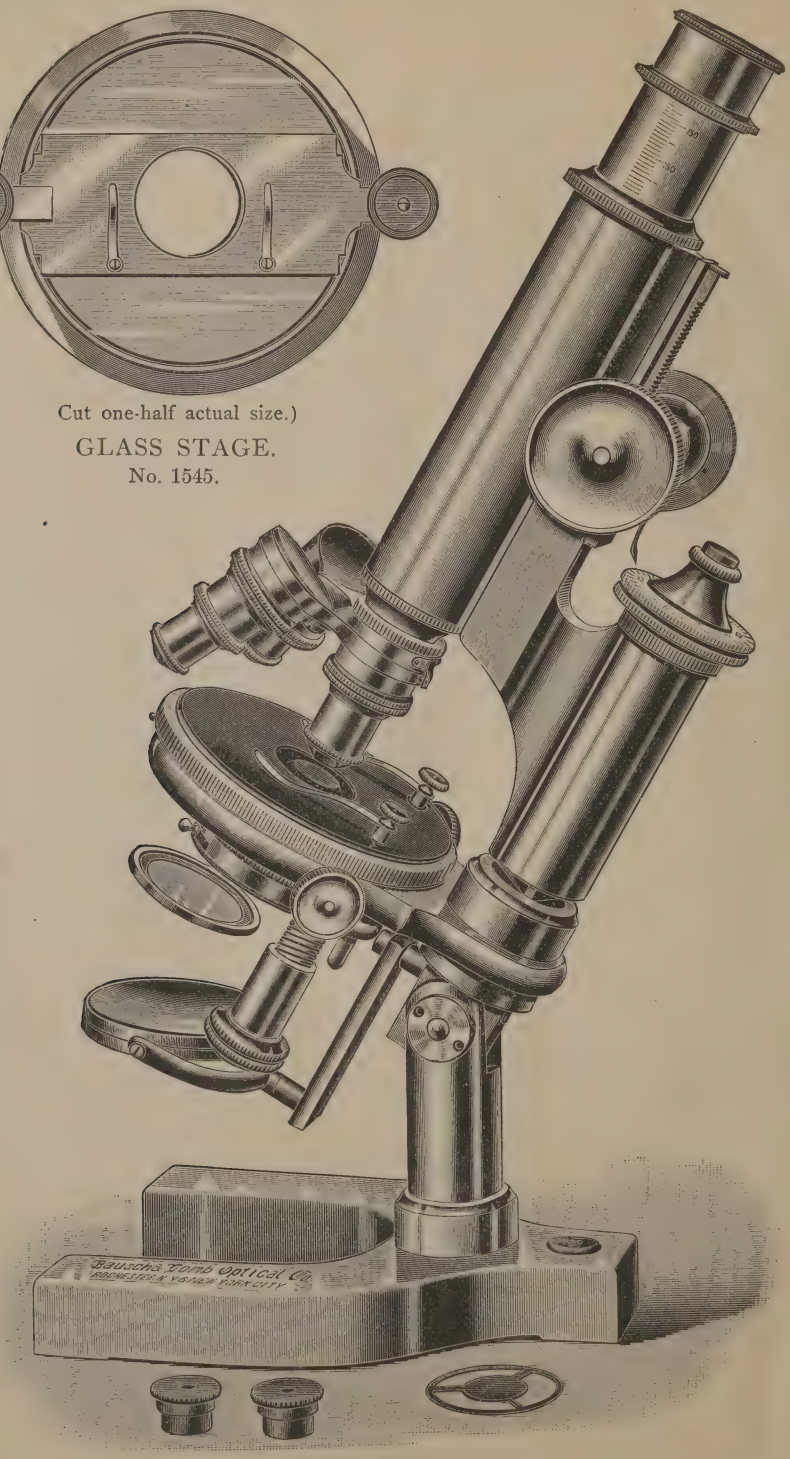
GLASS STAGE.

No. 1545.



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BBC 8—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

BBC & BBCS.

This microscope corresponds with the BB in all respects, with the following exceptions:

The jointed **pillar is** somewhat **higher,** to admit of the attachment and ready operation of the complete substage attachment, No. 1485.

The **stage** is **revolvable** with hard rubber surface, and resting upon a strong stage plate, which is provided **with centering screws.** These may be used for obtaining exact coincidence with the optical axis, and within narrow limits give a mechanical movement for the object.

This microscope is made in two forms:

BBC. With adjustable screw substage, No. 1480, as in the BB.

BBCS. With complete substage attachment, No. 1485, provided with rack and pinion adjustment in place of adjustable screw substage.

BBC1.	With 1 eyepiece $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$66.00	$65.00
BBC2.	BBC 1 and double nosepiece,	71.00	70.00
BBC3.	With 2 eyepieces, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	68.00	67.00
BBC4.	BBC 3 and double nosepiece,	73.00	72.00
BBC5.	With 2 eyepieces 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	74.00	73.00
BBC6.	BBC 5 and triple nosepiece,	81.50	80.50
BBC7.	With 2 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser in mounting with iris diaphragm,	115.00	104.50
BBC8.	BBC 7 and triple nosepiece,	122.50	112.00
BBCS1.	With 1 eyepiece $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$82.00	80.00
BBCS2.	BBCS 1 and double nosepiece,	87.00	85.00
BBCS3.	With 2 eyepieces $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	84.00	82.00
BBCS4.	BBCS 3 and double nosepiece,	89.00	87.00
BBCS5.	With 2 eyepieces 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	90.00	88.00
BBCS6.	BBCS 5 and triple nosepiece,	97.50	95.50
BBCS7.	With 2 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	130.00	119.50
BBCS8.	BBCS 7 and triple nosepiece,	137.50	127.00
BBCS9.	With 3 eyepieces $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	132.00	121.50
BBCS10.	BBCS 9 and triple nosepiece,	139.50	129.00
BBCS11.	With 3 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, triple nosepiece and Abbe condenser,	145.50	135.00
BBCS12.	With 4 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, objectives, quadruple nosepiece and Abbe condenser,	152.00	141.50
	Polished wood case with beveled plate glass front, in place of one accompanying microscope, extra,	2.75	
	Revolving Microscope Table, with 3 drawers, adjustable for height,	10.00	
	Glass Stage, Circular, as illustrated on opposite page (see Cat. No. 1545), extra,	6.00	
	ATTACHABLE MECHANICAL STAGE, No. 1555, easily applied to this stand, extra,	25.00	

CONTINENTAL MICROSCOPE.

BBCD & BBCDS.

These instruments are in all respects like the BB, with the following exceptions: The **jointed pillar is** somewhat **higher,** as in the BBC.

The **stage** is **Revolving Mechanical** Stage, No. 1560, provided **with silvered graduations for** the **retangular movements** and resting upon a strong stage plate, provided with centering screws as in the BBC.

This microscope is made in two forms:

BBCD. With adjustable screw substage, No. 1480, as in the BB.

BBCDS. With complete substage attachment, No. 1485, provided with rack and pinion adjustment in place of the adjustable screw substage.

BBCD1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$98.00	$97.00
BBCD2.	BBCD 1 and double nosepiece,	103.00	102.00
BBCD3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	100.00	99.00
BBCD4.	BBCD 3 and double nosepiece,	105.00	104.00
BBCD5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	106.00	105.00
BBCD6.	BBCD 5 and triple nosepiece,	113.50	112.50
BBCD7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser in mounting with iris diaphragm,	147.00	136.50
BBCD8.	BBCD 7 and triple nosepiece,	154.50	144.00
BBCDS1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$114.00	112.00
BBCDS2.	BBCDS 1 and double nosepiece,	119.00	117.00
BBCDS3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	116.00	114.00
BBCDS4.	BBCDS 3 and double nosepiece,	121.00	119.00
BBCDS5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	122.00	120.00
BBCDS6.	BBCDS 5 and triple nosepiece,	129.50	127.50
BBCDS7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	162.00	151.50
BBCDS8.	BBCDS 7 and triple nosepiece,	169.50	159.00
BBCDS9.	With 3 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	164.00	153.50
BBCDS10.	BBCDS 9 and triple nosepiece,	171.50	161.00
BBCDS11.	With 3 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and triple nosepiece,	177.50	167.00
BBCDS12.	With 4 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and quadruple nosepiece,	184.00	173.50
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,		2.75
	Revolving Microscope Table, with 3 drawers, adjustable for height,		10.00

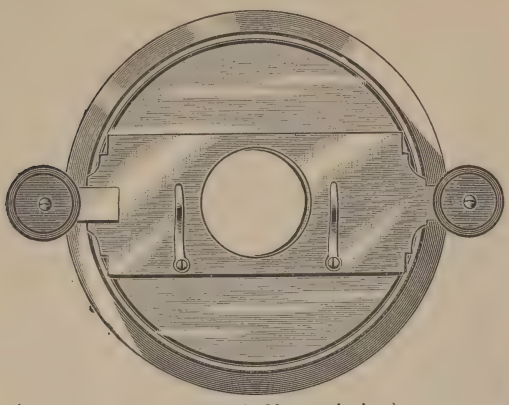
CONTINENTAL MICROSCOPE.

CAS.

This instrument is in all respects like the CCS with the following exception:

The stage is square, of large size with rounded corners, and has attached to the upper surface a hard rubber plate, as in the BB.

CAS1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$94.00	$94.00
CAS2.	CAS 1 and double nosepiece,	99.00	99.00
CAS3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	96.00	96.00
CAS4.	CAS 3 and double nosepiece,	101.00	101.00
CAS5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ objectives,	102.00	102.00
CAS6.	CAS 5 and triple nosepiece,	109.50	109.50
CAS7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	140.00	133.50
CAS8.	CAS 7 and triple nosepiece,	147.50	141.00
CAS9.	With 3 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	142.00	135.50
CAS10.	CAS 9 and triple nosepiece,	149.50	143.00
CAS11.	With 3 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and triple nosepiece,	156.50	149.00
CAS12.	With 4 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and quadruple nosepiece,	162.00	155.50
	Polished wood case, with beveled plate glass front, in place of the one accompanying microscope, extra,		3.00
	Revolving Microscope Table with 3 drawers, adjustable for height,		10.00
	Glass Stage, Square (see Cat. No. 1540), extra,		6.00
	ATTACHABLE MECHANICAL STAGE, No. 1555, easily applied io this stand, extra,		25.00



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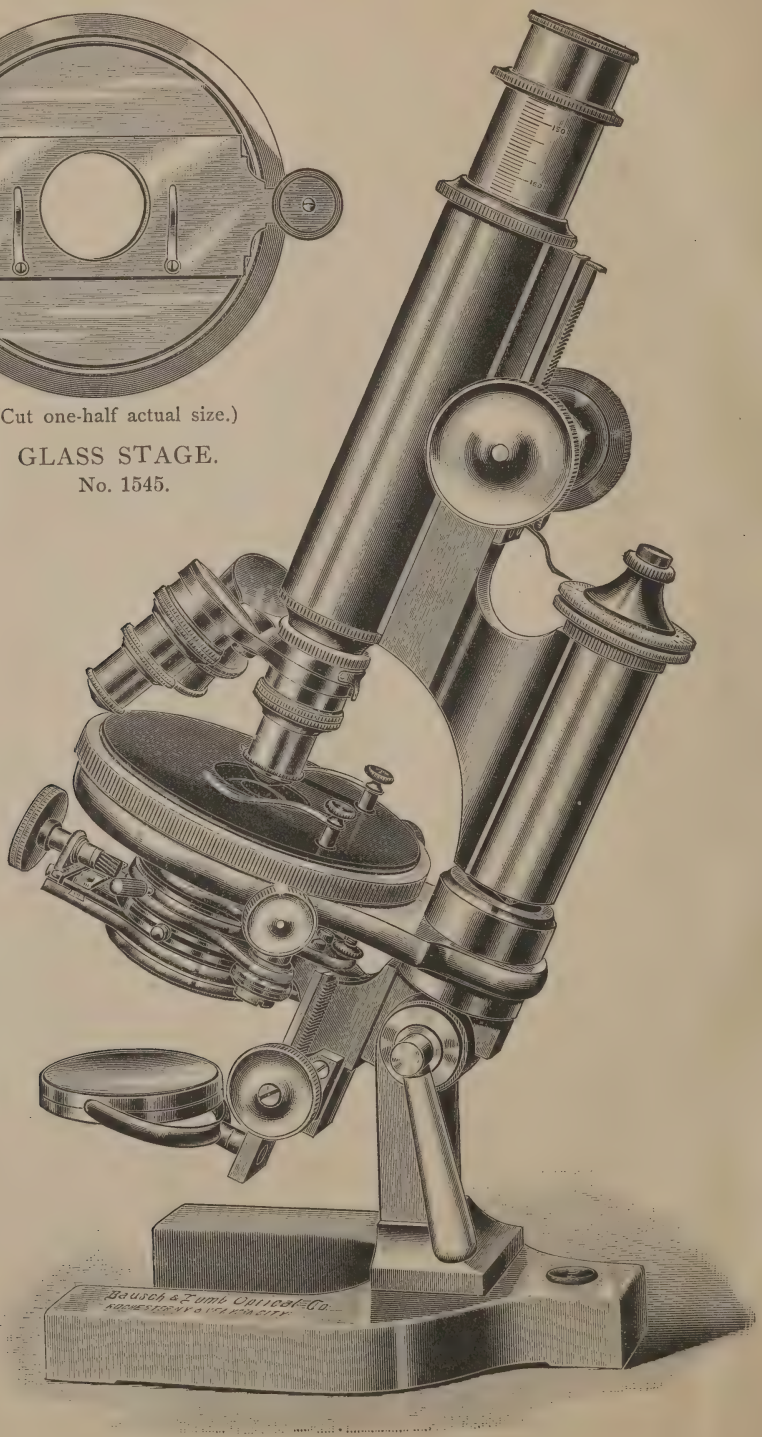
GLASS STAGE.
No. 1545.



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CCS 8—CONTINENTAL MICROSCOPE.

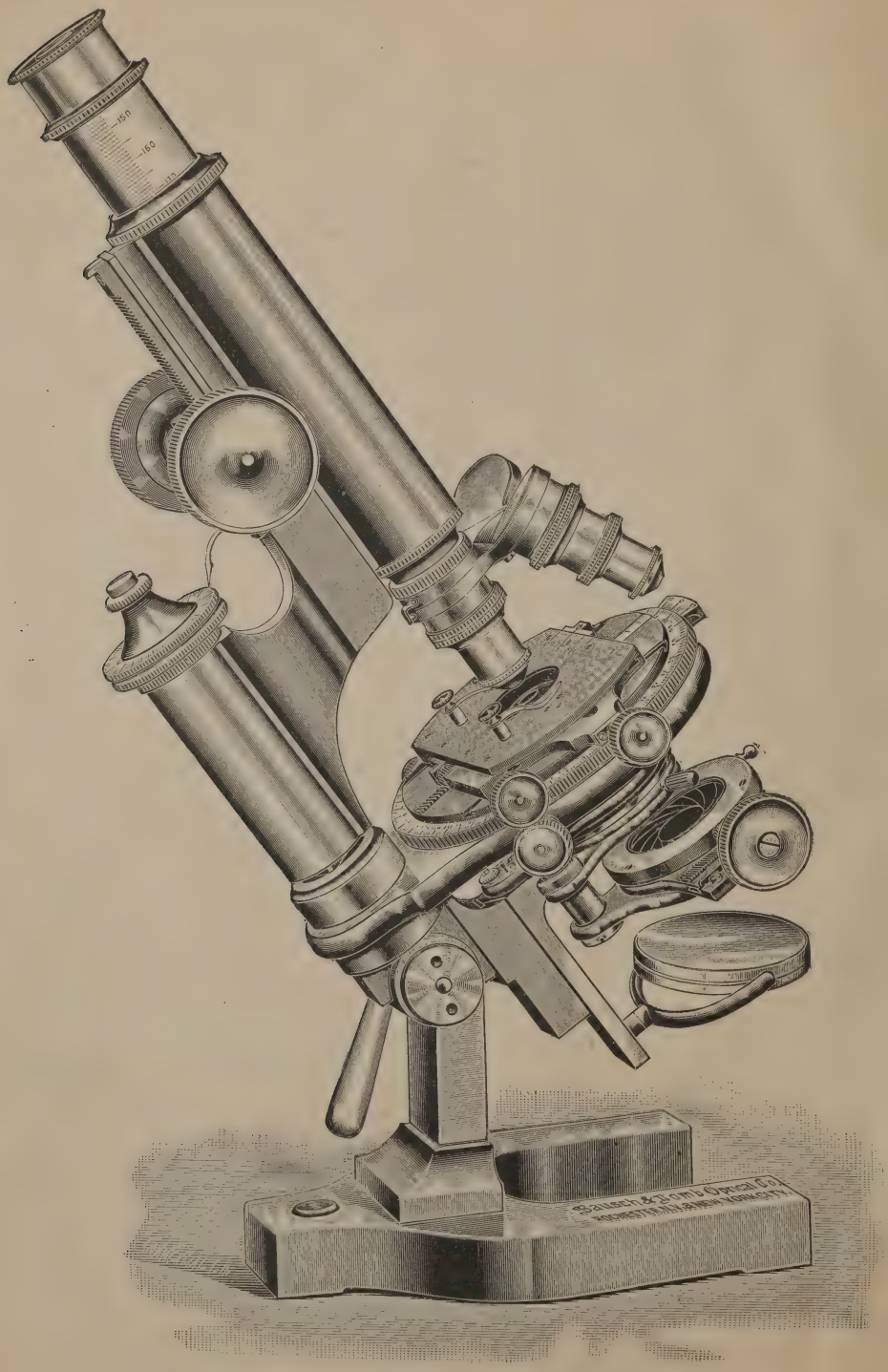
CONTINENTAL MICROSCOPE.

CCS.

This instrument is of **large size** and made of **brass throughout,** highly polished and lacquered. Wherever practicable, the **corners are rounded.** The base is of proportionately **large size,** giving unusual stability at any angle of inclination, with a large space for manipulating the mirror. The **stage** is **circular,** of **large size, revolvable** and has hard rubber surface. It rests upon a heavy stage plate, provided **with centering screws** for obtaining exact coincidence with the optical axis, and within narrow limits giving a mechanical movement for the object. The stage is easily removable when it is desired to attach Mechanical Stage, No. 1570. The entire substage, fully described under No. 1485, is adjustable by diagonal rack and pinion, provided with **improved solid bearings.** Large plane and concave mirrors are supplied. The joint for inclination is provided with a lever for clamping at any inclination. The coarse adjustment is by diagonal rack and pinion. The fine adjustment is by micrometer screw with graduated and silvered head with an indicator. The draw tube is graduated in millimeters, and nickel plated, and is adjustable in the **cloth lined sleeve** of the main tube ; when set at 145 mm. it gives short standard of tube length when the double or triple nosepiece is used.

N. B.—For detailed description of coarse and fine adjustment and other parts read Important Facts, page 8.

CCS1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$110.00	$110.00
CCS2.	CCS 1 and double nosepiece,	115.00	115.00
CCS3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ objectives,	112.00	112.00
CCS4.	CCS 3 and double nosepiece,	117.00	117.00
CCS5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	118.00	118.00
CCS6.	CCS 5 and triple nosepiece,	125.50	125.50
CCS7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	156.00	149.50
CCS8.	CCS 7 and triple nosepiece,	163.50	157.00
CCS9.	With 3 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	158.00	151.50
CCS10.	CCS 9 and triple nosepiece,	165.50	159.00
CCS11.	With 3 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and triple nosepiece,	171.50	165.00
CCS12.	With 4 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and quadruple nosepiece,	178.00	171.50
	Polished wood case, with beveled plate glass front, in place of the one accompanying microscope, extra,	3.00	
	Revolving Microscope Table, with 3 drawers, adjustable for height,	10.00	
	Glass Stage, Circular, as illustrated on opposite page (see Cat. No. 1545), extra,	6.00	
	ATTACHABLE MECHANICAL STAGE No. 1555, easily applied to this stand, extra,	25.00	



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CCDS—CONTINENTAL MICROSCOPE.

CONTINENTAL MICROSCOPE.

CCDS.

This instrument is in all respects like the CCS, with the following exception.

The **stage** is replaced by our large **improved Mechanical** Stage, No. 1570, **graduated** in mm. **for** the **rectangular movements, and on** the **circumference** in degrees and provided **with** a **vernier.** The whole rests upon the stage plate, with centering adjustments. This stage and the revolving stage of the CCS are easily interchangeable.

CCDS1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$150.00	$150.00
CCDS2.	CDS 1 and double nosepiece,	155.00	155.00
CCDS3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	152.00	152.00
CCDS4.	CDS 3 and double nosepiece,	157.00	157.00
CCDS5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	158.00	158.00
CCDS6.	CDS 5 and triple nosepiece,	165.50	165.50
CCDS7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	198.00	189.50
CCDS8.	CDS 7 and triple nosepiece,	205.50	197.00
CCDS9.	With 3 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives and Abbe condenser,	200.00	191.50
CCDS10.	CDS 9 and triple nosepiece,	207.50	199.00
CCDS11.	With 3 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion objectives, Abbe condenser and triple nosepiece,	213.50	205.00
CCDS12.	With 4 eyepieces 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, objectives, Abbe condenser and quadruple nosepiece,	220.00	211.50
	Polished Wood Case, with beveled plate glass front, in place of the one accompanying microscope, extra,	3.00	
	Revolving Microscope Table, with 3 drawers, adjustable for height,	10.00	

(Cut one-half actual size.)

D—AMERICAN TYPE MICROSCOPE.

LIBRARY.

AMERICAN TYPE MICROSCOPE.

D & DD.

LIBRARY.

This instrument is offered as a good working, simple instrument to take the place of the unreliable cheap foreign microscopes.

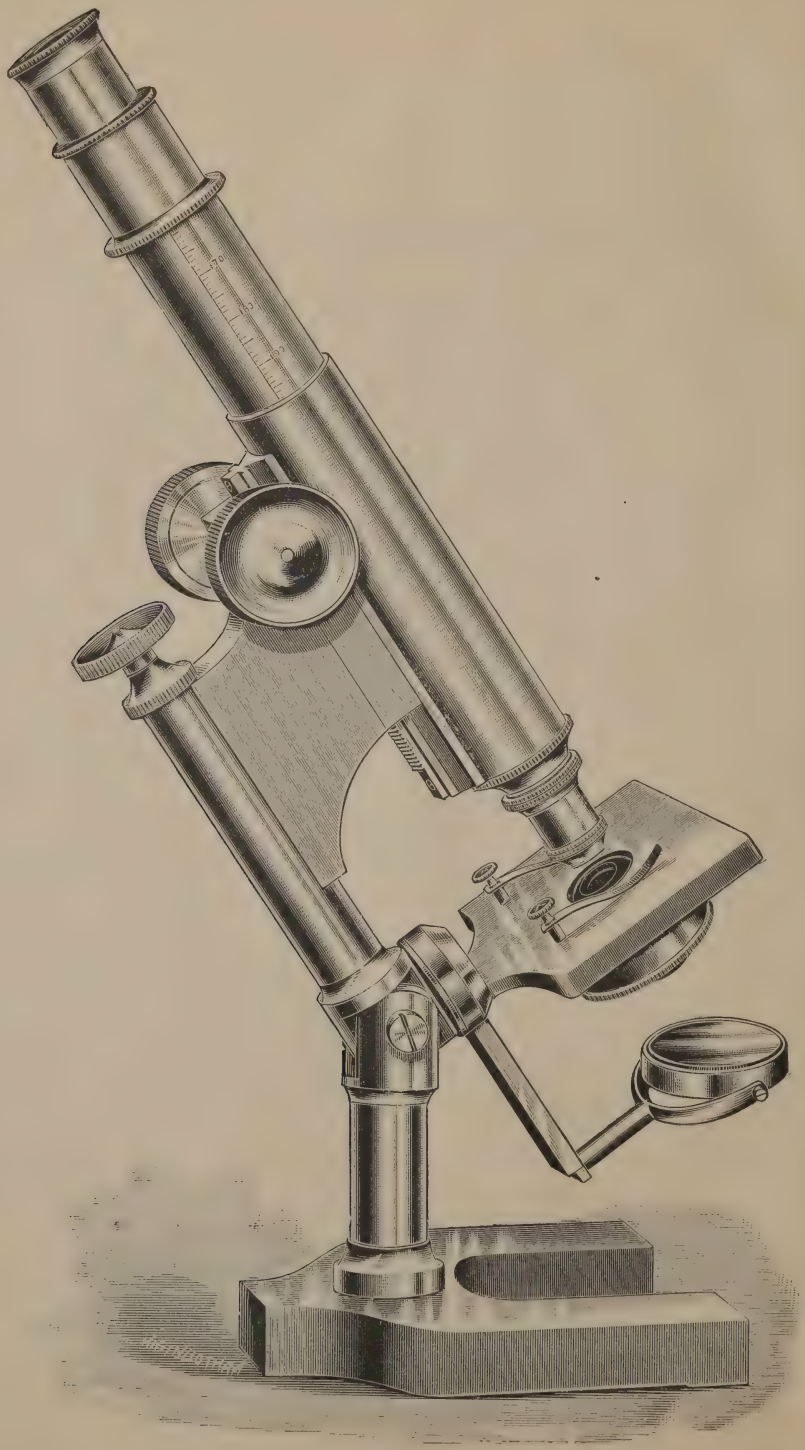
It has japanned iron foot and arm and joint for inclination; the adjustment is by rack and pinion and of such delicacy that the medium power objectives can be focused with convenience; this form of adjustment is especially to be recommended when only one adjustment is used, as it will give longer wear in the hands of the young student. The body is provided with draw tube and society screw. The mirror is concave, swinging so as to give oblique illumination, and capable of being brought **above the stage** for illumination of opaque objects. The stage is provided with spring clips.

The microscope is made in two forms:

D. As described above.

DD. The same, but with the addition of an adjustable stage plate, provided with micrometer screw, which, while limited in its motion, forms a serviceable fine adjustment.

D0.	With 1 eyepiece and $\frac{1}{2}$ inch and $\frac{1}{5}$ inch divisible objective,	**$18.00**
D1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**28.00**
D2.	D 1 and double nosepiece,	**33.00**
D3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**30.00**
D4.	D 3 and double nosepiece,	**35.00**
DD0.	With 1 eyepiece and $\frac{1}{2}$ inch and $\frac{1}{5}$ inch divisible objective,	**$21.00**
DD1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**31.00**
DD2.	DD 1 and double nosepiece,	**36.00**
DD3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**33.00**
DD4.	DD 3 and double nosepiece,	**38.00**



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EE—AMERICAN TYPE MICROSCOPE.

HARVARD.

AMERICAN TYPE MICROSCOPE.

EE.

HARVARD.

The stand is made entirely of brass with bronze pillar and arm. Although compact so as to allow its convenient use in the upright position on a common table, it still gives sufficient range of adjustment for all ordinary work. The base is of the horseshoe form with a projection at the back to give it steadiness when the body is inclined. Coarse adjustment is by diagonal rack and pinion. Fine adjustment is by micrometer screw, with milled head of more than ordinary size, acting on our patent movement. The main tube is provided with cloth-lined sleeve-tube and draw-tube graduated in millimeters. The stage is large and provided with spring clips. Our dome diaphragm is attached to its lower surface by a substage. The mirrors are plane and concave, of large size and may be swung with the mirror bar to any obliquity below or **above the stage,** for the illumination of opaque objects; they also have adjustment on the mirror bar.

N. B.—For detailed description of coarse and fine adjustments and other parts refer to Important Facts, page 8.

EE1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$50.00**
EE2.	EE 1 and double nosepiece,	**55.00**
EE3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**54.00**
EE4.	EE 3 and double nosepiece,	**59.00**
EE5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ objectives,	**60.00**
EE6.	EE 5 and triple nosepiece,	**67.50**
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	**2.50**
	Revolving Microscope Table, with 3 drawers, adjustable for height,	**10.00**

(Cut one-half actual size.)

F—AMERICAN TYPE MICROSCOPE.

MODEL.

AMERICAN TYPE MICROSCOPE.

F & FS.

MODEL.

The tripod base, pillars and arm, are neatly japanned. The axis is arranged with strong bearings to allow inclination of the body to any angle. Coarse adjustment is by diagonal rack and pinion. Fine adjustment is by a delicate micrometer screw, acting on our patent movement. The stage is of brass, circular in form, thin to allow great obliquity, but of sufficient strength to be firm under manipulation. Attached to it below, is a sub-stage ring and dome diaphragm, both of which may be removed. The main tube is provided with cloth-lined sleeve-tube and draw-tube graduated in millimeters, the latter having nosepiece with society screw. Plane and concave mirrors are of large size, adjustable on the mirror bar. The mirror bar swings on a bearing, the axis of which lies in the plane of the stage, to any obliquity below or **above** the stage, the latter for the illumination of opaque objects.

N. B.—For detailed description of coarse or fine adjustment and other parts, refer to Important Facts, page 8.

The microscope is made in two forms:

F. As described above.

FS. With square stage as fitted to BB and with screw substage (Cat. No. 1480.)

F1.	With 1 eyepiece and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**$44.00**
F2.	F 1 and double nosepiece,	**49.00**
F3.	With 2 eyepieces and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**48.00**
F4.	F 3 and double nosepiece,	**53.00**
F5.	With 2 eyepieces and 2 inch, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**54.00**
F6.	F 5 and triple nosepiece,	**61.50**
FS1.	With 1 eyepiece and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**$50.00**
FS2.	FS 1 and double nosepiece,	**55.00**
FS3.	With 2 eyepieces and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**54.00**
FS4.	FS 3 and double nosepiece,	**59.00**
FS5.	With 2 eyepieces and 2 inch, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**60.00**
FS6.	FS 5 and triple nosepiece,	**67.50**
FS7.	With 2 eyepieces, $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm,	**107.50**
FS8.	FS 7 and triple nosepiece,	**115.00**
	Revolving stage (for F), with removable spring clips, extra,	**5.00**
	Glass stage (for F), with slide carrier, which slips over either plain or revolving stage, extra,	**5.00**
	Glass Stage, Square (for FS), see Cat. No. 1540, extra,	**6.00**
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	**2.50**
	Revolving Microscope Table, with 3 drawers, adjustable for height,	**10.00**

(Cut one-half actual size.)

G—AMERICAN TYPE MICROSCOPE.

PHYSICIAN.

AMERICAN TYPE MICROSCOPE.

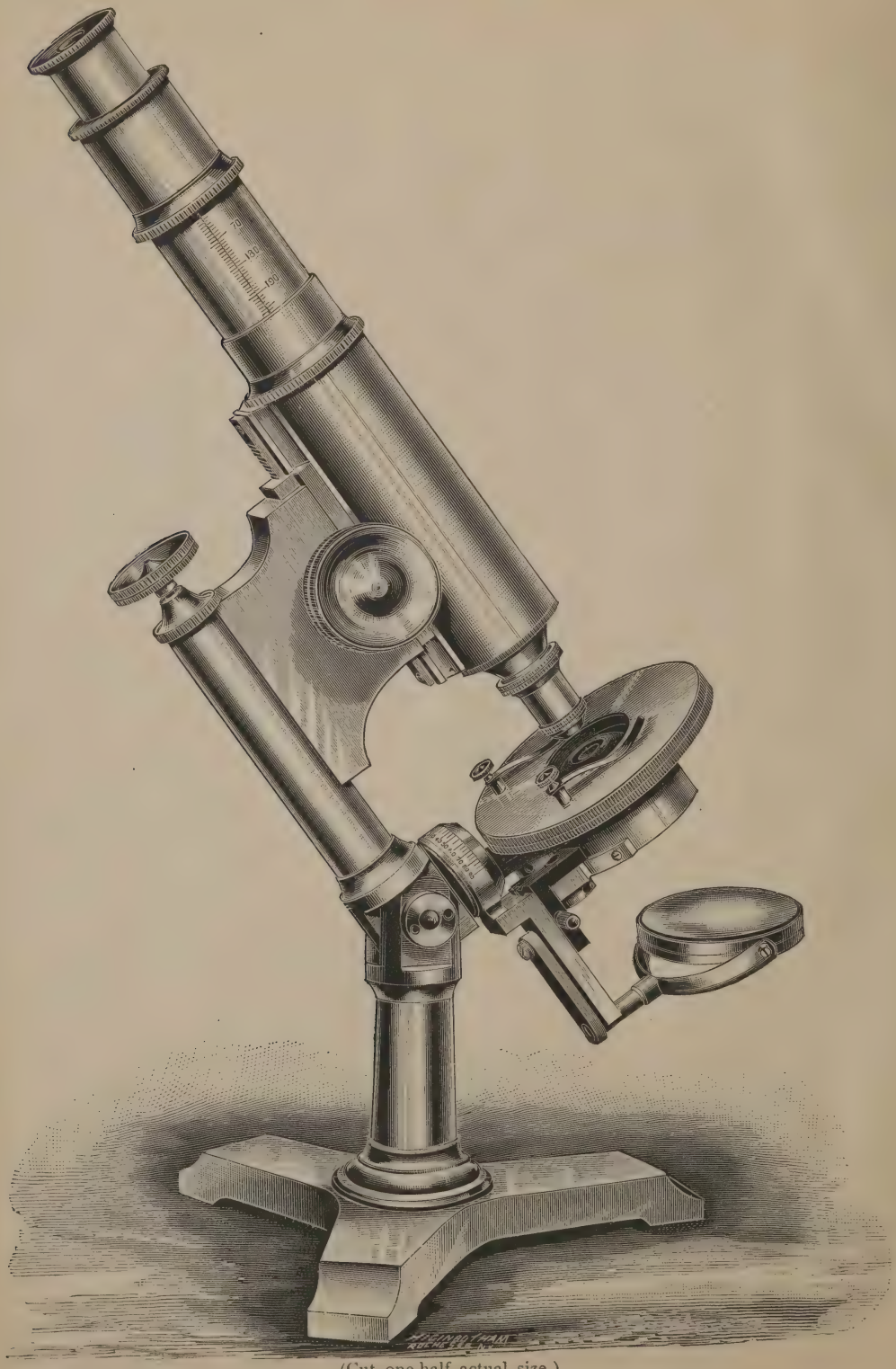
G.

PHYSICIAN.

The base is japanned iron; pillar and arm are of bronze, connected by a joint for inclination of the body. Coarse adjustment is by diagonal rack and pinion, giving a long range. Fine adjustment, by micrometer screw, acting on our patent movement. Main tube has cloth-lining and is provided with cloth-lined sleeve-tube and graduated draw-tube. The stage consists of our square glass stage and slide-carrier attached to a firm projecting stage plate. The mirror bar is provided with adjustable substage, carrying dome diaphragm, and plane and concave mirrors. It swings on its axis in the plane of the stage to any obliquity below or **above the stage.**

N. B.— For detailed description of coarse and fine adjustment and other parts, refer to Important Facts, page 8.

G1.	With 1 eyepiece and $\frac{3}{4}$ inch, and $\frac{1}{5}$ inch objectives,	**$55.00**
G2.	G 1 and double nosepiece,	**60.00**
G3.	With 2 eyepieces and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**59.00**
G4.	G 3 and double nosepiece,	**64.00**
G5.	With 2 eyepieces and 2 inch, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	**65.00**
G6.	G 5 and triple nosepiece,	**72.50**
G7.	With 2 eyepieces and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives and Abbe condenser in mounting with iris diaphragm,	**112.50**
G8.	G 7 and triple nosepiece,	**120.00**
	Investigator base, in place of japanned iron base, with suitable case, extra,	**2.50**
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	**2.75**
	Revolving Microscope Table, with 3 drawers, adjustable for height,	**10.00**



(Cut one-half actual size.)

H—AMERICAN TYPE MICROSCOPE.

INVESTIGATOR.

AMERICAN TYPE MICROSCOPE.

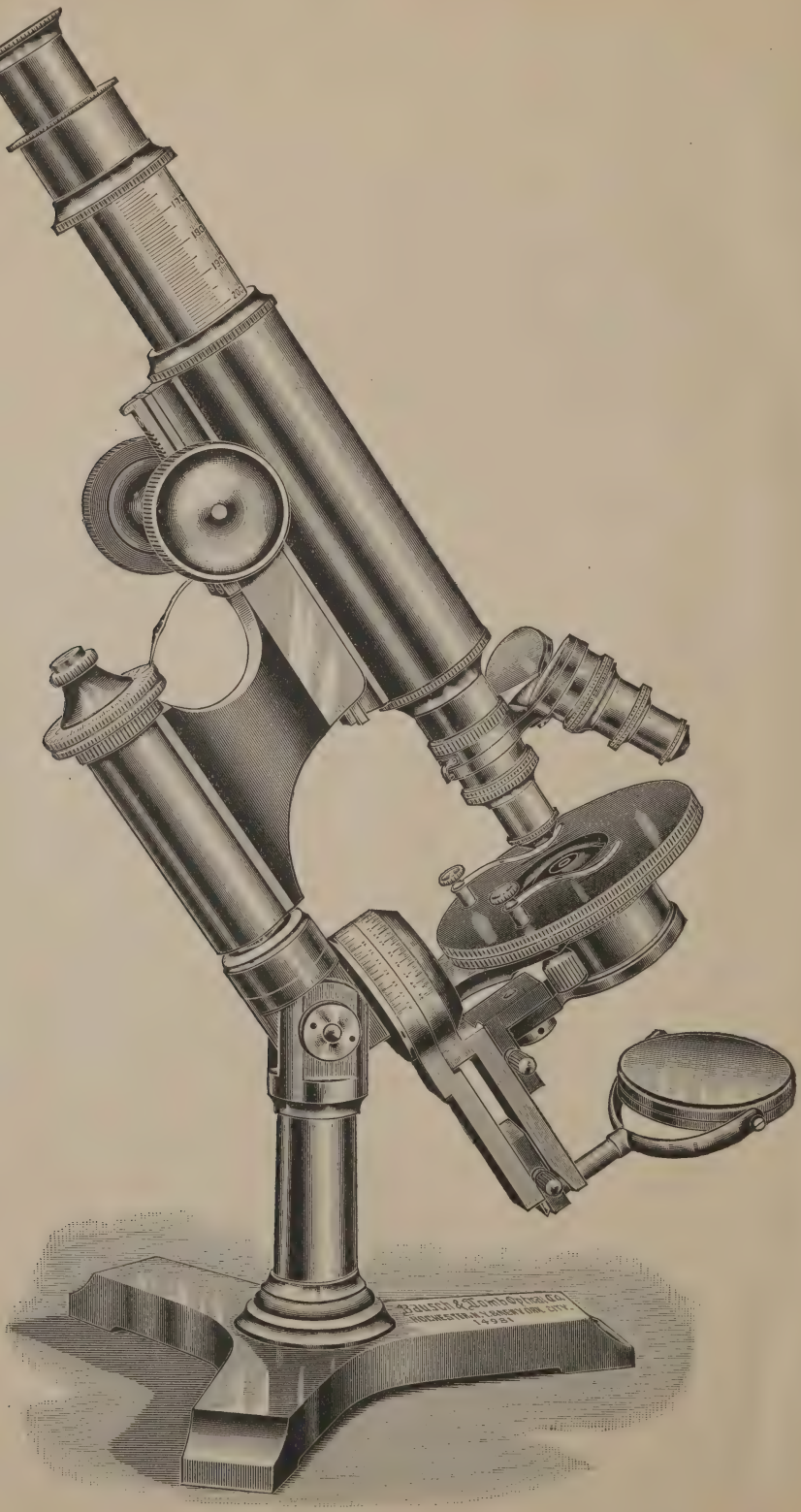
H.

INVESTIGATOR.

The base is brass, of the tripod form; pillar and arm of bronze, connected by a solid joint for inclination of body; diagonal rack and pinion for coarse adjustment; fine adjustment by our patent frictionless motion; draw-tube graduated in millimeters and sliding in cloth-lined sleeve in main tube. The stage lies in same plane as center of movement for mirror; is of bronze, has concentric, revolving motion and removable clips. The mirror bar swings upon its bearings to any obliquity below or **above the stage**; the mirrors are plane and concave and adjustable; the substage is adjustable and fitted with dome diaphragm; steel pin for centering substage is provided.

N. B.—For detailed description of coarse and fine adjustment and other parts, refer to Important Facts, page 8.

H1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$64.00**
H2.	H 1 and double nosepiece,	**69.00**
H3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**68.00**
H4.	H 3 and double nosepiece,	**73.00**
H5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**74.00**
H6.	H 5 and triple nosepiece,	**81.50**
H7.	With 2 eyepieces and $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm,	**121.50** 124.00 129.00
H8.	H 7 and triple nosepiece,	**131.50**
	Glass stage, with slide carrier which slips over brass stage, extra,	**5.00**
	Polished wood case, with beveled plate glass front, in place of one accompanying microscope, extra,	**2.75**
	Revolving Microscope Table, with 3 drawers, adjustable for height,	**10.00**



(Cut one-half actual size.)

J—AMERICAN TYPE MICROSCOPE.

UNIVERSAL.

AMERICAN TYPE MICROSCOPE.

J.

UNIVERSAL.

The base is of the tripod form and made of brass. The bronze pillar is large and provided with joint for inclination. A heavy thumb-screw permits the instrument to be fastened in any position on the base. The coarse adjustment is by diagonal rack and pinion of long range. The fine adjustment is by micrometer screw, working in a steel nut on the triangular bearing of the arm. The head of the micrometer screw is silvered and graduated, and provided with indicator. The main tube has two graduated draw tubes, sliding in the cloth-lined main tube. The stage has concentric, revolving motion and removable spring clips. The mirrors are plane and concave and of large size, and both these and the substage, carrying dome diaphragm, are adjustable separately on their respective bars. The circular bearings of these are large and are graduated to degrees and silvered. The mirrors and substage bars have their axes in the plane of the stage and move independent of one another, or together to any obliquity below or **above the stage.** A steel pin for centering substage accompanies the instrument.

N. B.—For detailed description of coarse and fine adjustment and other parts, refer to Important Facts, page 8.

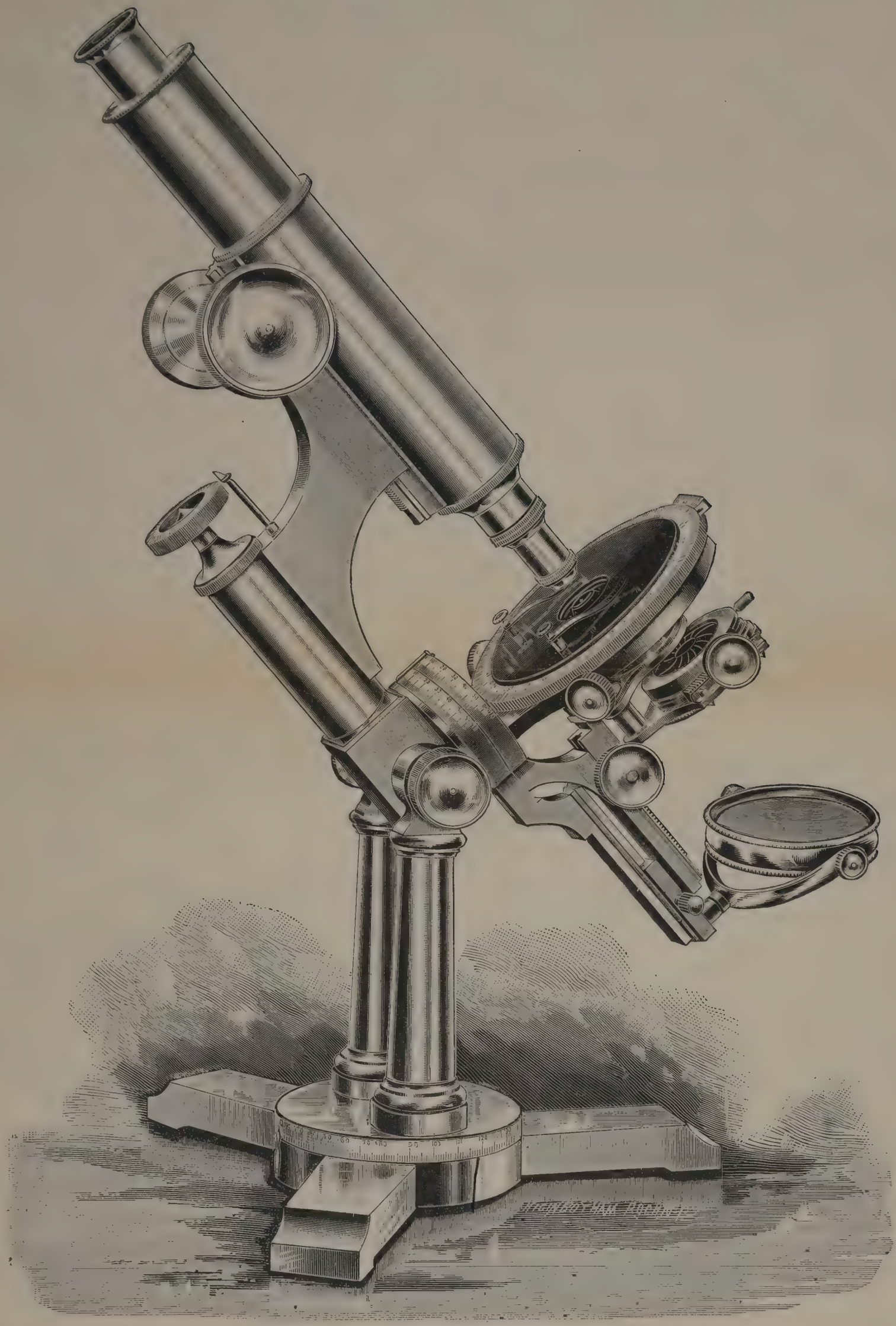
This instrument is made in three forms:

J. As described above.

JS. As above, but with complete substage arrangement No. 1485.
For prices of this microscope, add $20.00 to prices of outfits from Nos. 1 to 6 and $14.00 from Nos. 7 to 12, listed below.

JSD. As above, but with complete substage arrangement No. 1485, and new improved mechanical stage, No. 1560.
For prices of this microscope add $52.00 to price of outfits from Nos. 1 to 6 and $46.00 from Nos. 7 to 12, listed below.

J1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	$74.00	
J2.	J 1 and double nosepiece,	79.00	
J3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	78.00	
J4.	J 3 and double nosepiece,	83.00	
J5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	84.00	
J6.	J 5 and triple nosepiece,	91.50	
J7.	With 2 eyepieces, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm,	131.50	131.50
J8.	J 7 and triple nosepiece,	139.00	139.00
J9.	With 3 eyepieces, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm,	135.50	135.50
J10.	J 9 and triple nosepiece,	143.00	143.00
J11.	With 3 eyepieces, 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm and triple nosepiece,	149.00	149.00
J12.	With 4 eyepieces, 2 inch, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser in mounting with iris diaphragm and quadruple nosepiece,	157.00	157.50
	Polished Wood Case, with beveled plate glass front, in place of one accompanying microscope, extra,	3.00	
	Revolving Microscope Table, with 3 drawers, adjustable for height,	10.00	



K—AMERICAN TYPE MICROSCOPE.

PROFESSIONAL.

AMERICAN TYPE MICROSCOPE.

K.

PROFESSIONAL.

This instrument may be considered as the highest attainment in microscopical construction in design, solidity and practical utility of the various parts. It is constructed entirely of brass and bronze. The base is unusually large and heavy. To its upper surface is fastened a revolving plate graduated and provided with index, to which is attached two pillars. The arm is fitted to the pillars by joint for inclination, with steel axis. Coarse adjustment is by spiral rack and pinion with large milled heads. The micrometer screw of fine adjustment, is graduated and provided with indicator. Main tube has draw tube, working in cloth lining. Tubes when contracted are of the long standard. Mirror and substage bars are separate and have independent movements, working on an axis in the plane of the stage. Both are graduated to degrees. Mirrors are plane and concave, of unusually large size and adjustable on mirror bar. The substage consists of the entire attachment No. 1485, and has a long adjustment by diagonal rack and pinion. The stage has a rubber stage plate and is revolving, graduated to degrees and provided with vernier. It has spring clips and centering adjustment. Graduations are all silvered.

N. B.— For detailed description of coarse and fine adjustment and other parts, refer to Important Facts, page 8.

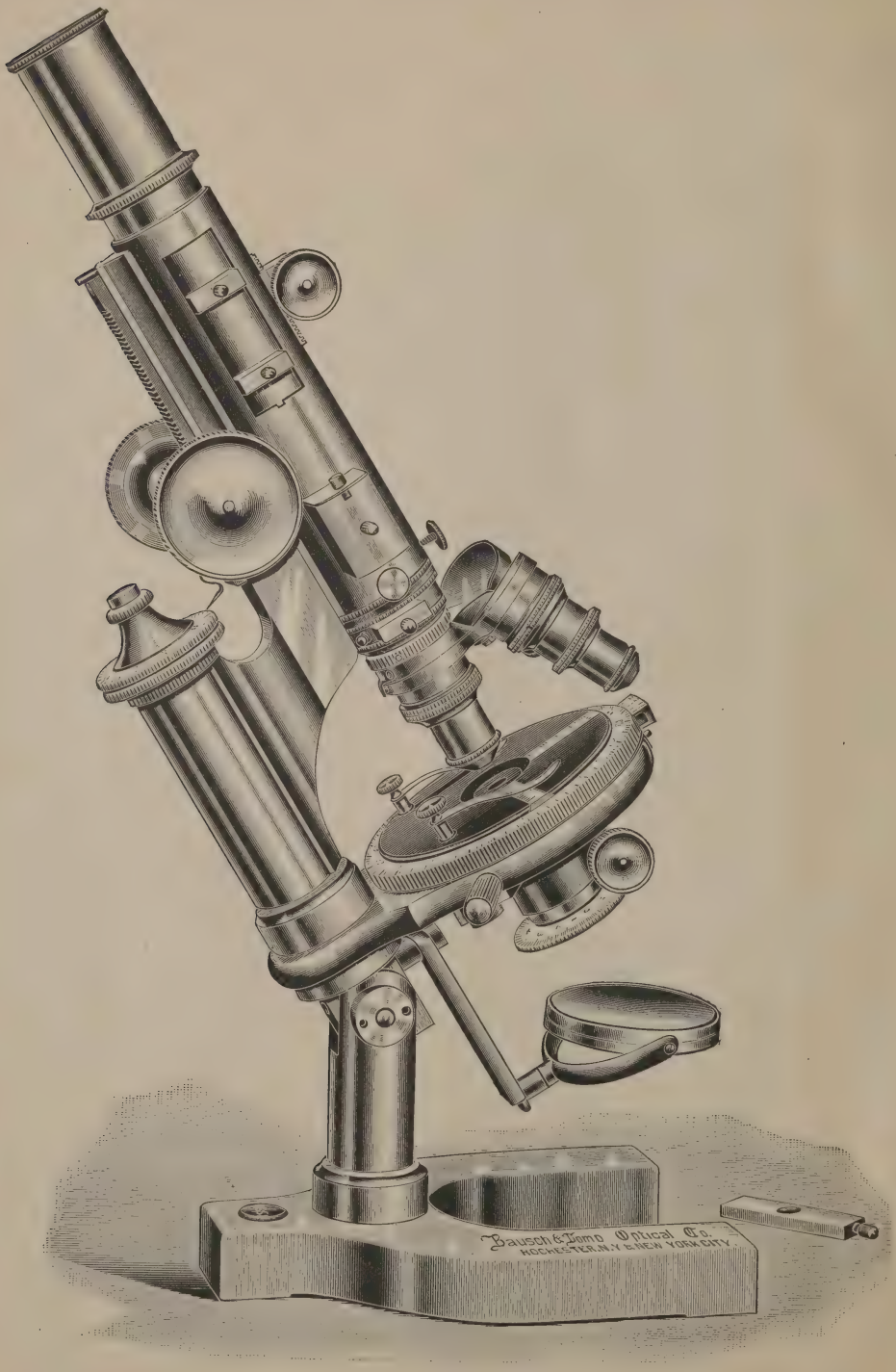
This instrument is made in two forms:

K. As described above.

KD. As above, but with our large improved mechanical stage No. 1570, graduated in millimeters for rectangular movements and on the circumference in degrees, and provided with a vernier.

For prices of this microscope, add $40.00 to prices of outfits listed below.

K1.	With 1 eyepiece and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	$154.00	
K2.	K 1 and double nosepiece,	159.00	
K3.	With 2 eyepieces and $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	158.00	
K4.	K 3 and double nosepiece,	163.00	
K5.	With 2 eyepieces and 2 inch, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch objectives,	164.00	
K6.	K 5 and triple nosepiece,	171.50	
K7.	With 2 eyepieces and $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives and Abbe condenser,	208.00	205.50
K8.	K 7 and triple nosepiece,	215.50	213.00
K9.	With 3 eyepieces, $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives and Abbe condenser,	212.00	209.50
K10.	K 9 and triple nosepiece,	219.50	217.00
K11.	With 3 eyepieces 2 inch, $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser and triple nosepiece,	225.50	223.00
K12.	With 4 eyepieces 2 inch, $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{12}$ inch oil immersion, Series III, objectives, Abbe condenser and quadruple nosepiece,	234.00	231.50
	Polished Wood Case, with beveled plate glass front, in place of one accompanying microscope, extra,	4.00	
	Revolving Microscope Table, with 2 drawers, adjustable for height,	10.00	



(Cut one-half actual size.)

BBCL—CONTINENTAL MICROSCOPE.

PETROGRAPHICAL.

CONTINENTAL MICROSCOPE.

BBCL & BBCLD.

PETROGRAPHICAL.

The stand proper of this instrument is the BBC, as described on page 23. The additions for petrographical work are as follows:

The main tube is fitted with double chambered box, one chamber of which contains the analyzing prism, the other being vacant, and which can be slid in or out at will without at any time leaving an opening through which dust might enter. The nosepiece has centering adjustment and opening for use of the various accessories, also ring to exclude light and dust when accessories are not in use. The eyepiece tube is moved in the main tube by rack and pinion and has two openings to receive accessories. The polarizer is mounted in revolving mounting. It may be vertically raised or depressed by a rack and pinion movement and is capable of an axial revolution upon a graduated and silvered circle with index. It is also provided with a compound condensing lens for securing converged rays of polarized light. This lens can be easily removed or replaced. The point at which the Nicol prisms are crossed is indicated by a pronounced click. Cross hair eyepieces have a projecting stud for lining the cross hairs, which fits into slits in the eyepiece tube 45° apart.

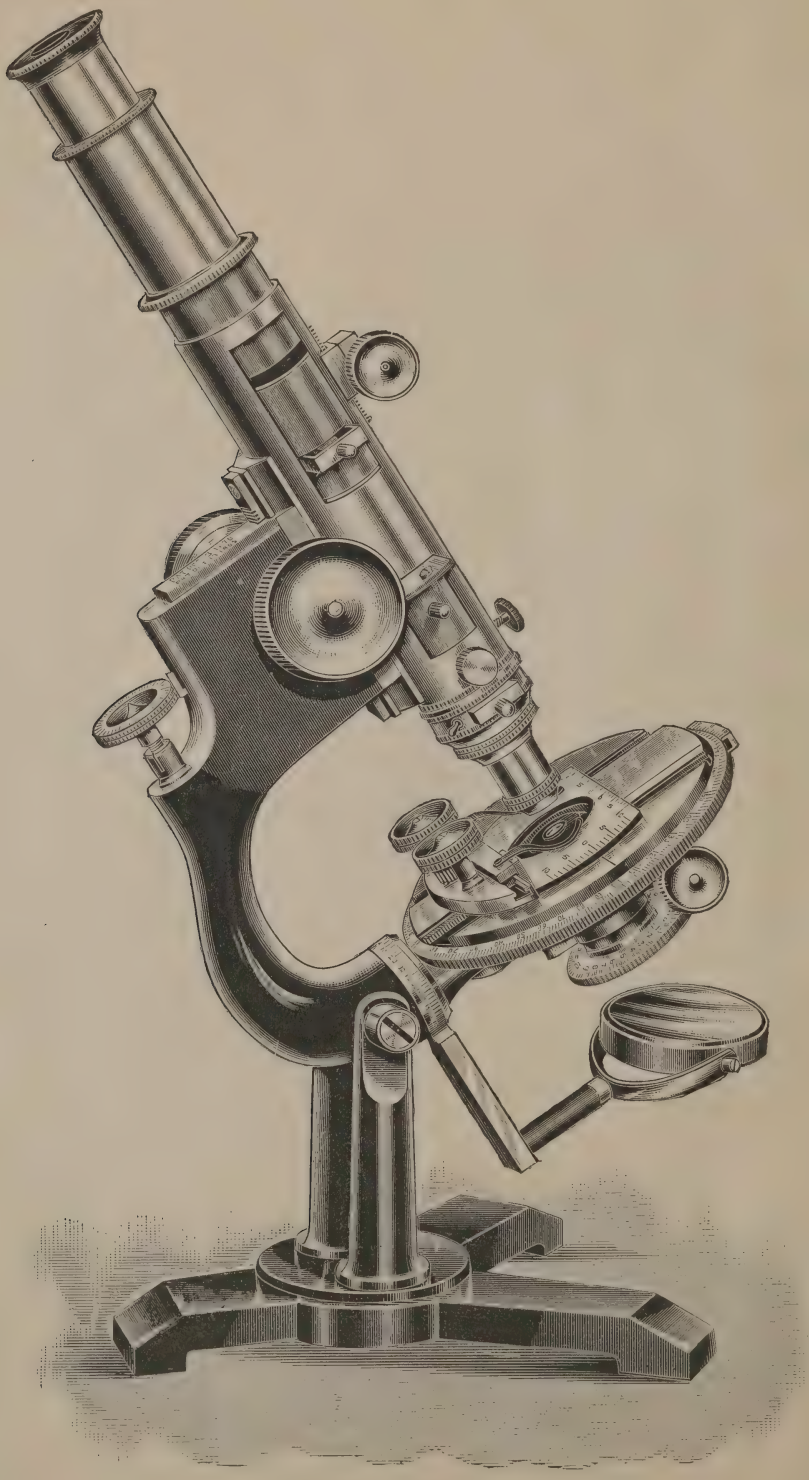
The following accessories are part of the instrument:

a) Bertrand lens for magnifying the interference figure.
b) Bertrand quadrant eyepiece with revolving prism.
c) Quarter undulation mica plate.
d) Quartz wedge.
e) Gypsum plate, red of the first order.

In the BBCL the stage is circular, revolving, of large size, having silvered graduations around the circumference, with vernier and with graduations at right angles, and is provided with centering arrangement moved by two milled heads at the side, and has a hard rubber plate fitted to its surface.

In the BBCLD the stage is our new improved mechanical stage, with silvered graduations around the edge, with vernier and graduations for the rectangular movements and is provided with centering arrangement moved by two milled heads at the side.

BBCL1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$193.00**
BBCL2.	BBCL 1 and double nosepiece,	**198.00**
BBCL3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**196.00**
BBCL4.	BBCL 3 and double nosepiece,	**201.00**
BBCL5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**202.00**
BBCL6.	BBCL 5 and triple nosepiece,	**209.50**
BBCLD1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$230.00**
BBCLD2.	BBCLD 1 and double nosepiece,	**235.00**
BBCLD3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**233.00**
BBCLD4.	BBCLD 3 and nosepiece,	**238.00**
BBCLD5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**239.00**
BBCLD6.	BBCL 5 and triple nosepiece,	**246.50**
	Fitting cross hairs in other eyepieces,	**1.00**



(Cut one-half actual side.)

FLD—AMERICAN TYPE MICROSCOPE.

PETROGRAPHICAL.

AMERICAN TYPE MICROSCOPE.

FL & FLD.

PETROGRAPHICAL.

The base, upright pillars and arm of this instrument are of japanned iron. Mirror-bar is adjustable and graduated, mirrors of large size, plane and concave. Coarse adjustment is by diagonal rack and pinion. Fine adjustment by micrometer screw with head graduated into one hundred parts. Pitch of screw, 0.5 mm. The nosepiece has centering adjustment and opening for the use of the various accessories, also ring to exclude light when not in use. The double chambered box in the main tube carries in one opening the upper nicol or analyzer, the second being vacant and which can be slid in and out at will, without at any time leaving an opening through which dust may enter. The eyepiece tube is moved in the main tube by rack and has two openings to receive accessories. The lower Nicol in polarizer is mounted in cylindrical box beneath the stage, to which it is held by a swinging arm, so that it may be thrown instantly to one side, if desired. The polarizer may be vertically raised or depressed by a rack and pinion movement, and is capable of axial revolution read on a graduated and silvered circle with index. It is provided with a compound lens, for securing converged polarized light, which may be removed at will. The point at which both Nicols are crossed, giving total extinction of light, is registered by a pronounced click, provided in the polarizer mounting. Cross hair eyepieces have a projecting stud, for lining the cross hairs, which fits into slits in eyepiece tube 45° apart.

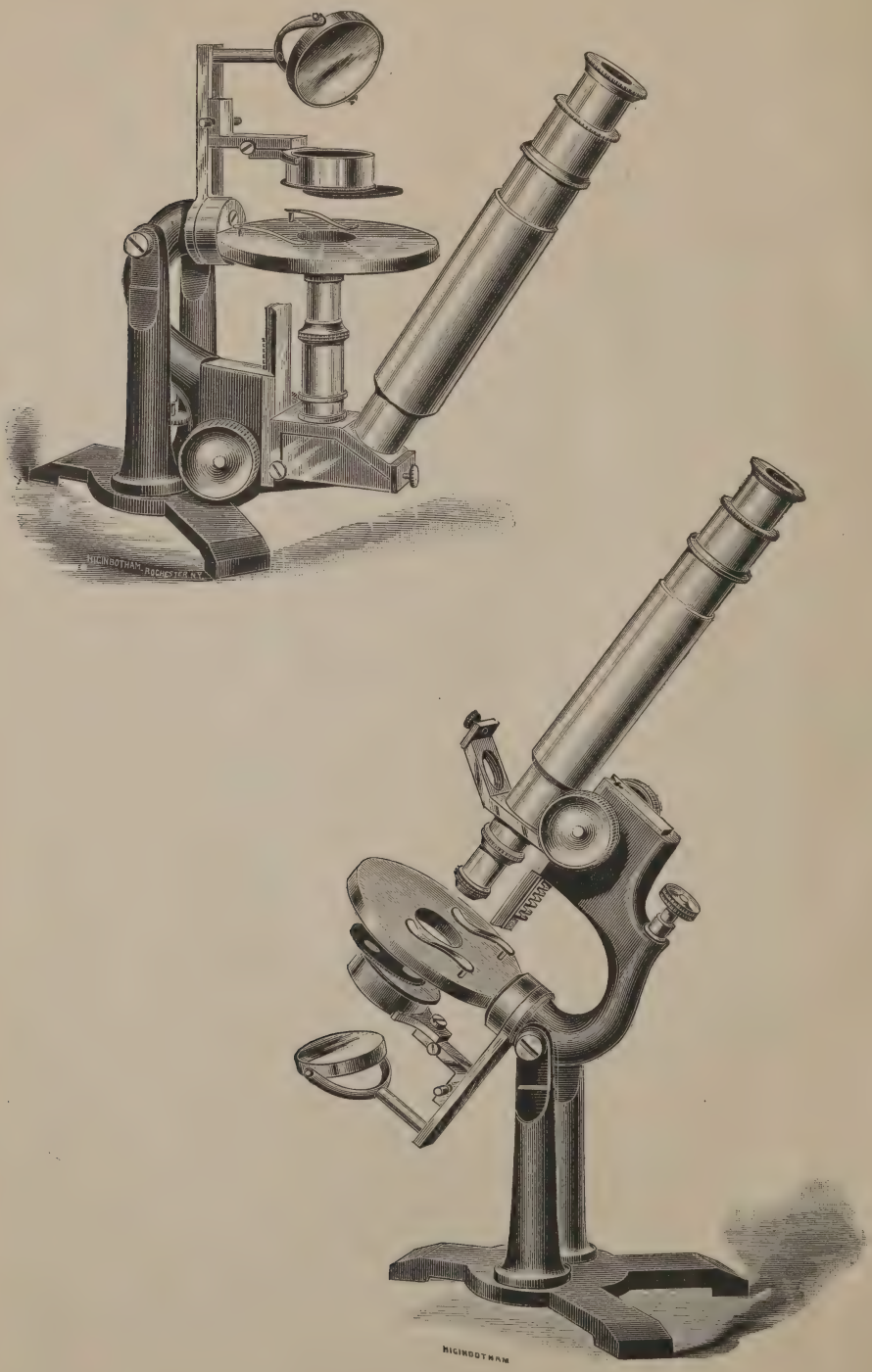
The following accessories are a part of the stand:

a) Bertrand's lens for magnifying the interference figure.
b) Bertrand's quadrant eyepiece with revolving prism.
c) Quarter undulation mica plate.
d) Quartz wedge.
e) Gypsum plate, red of the first order.

The eyepieces accompanying outfits are of the Continental type and fitted with cross hairs; objectives of Series I.

In the FL the stage is same as in BBCL.
In the FLD the stage is same as in BBCLD.

FL1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$168.00**
FL2.	FL 1 and double nosepiece,	**173.00**
FL3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**171.00**
FL4.	FL 3 and double nosepiece,	**176.00**
FL5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**177.00**
FL6.	FL 5 and triple nosepiece,	**184.50**
FLD1.	With 1 eyepiece and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**$205.00**
FLD2.	FLD 1 and double nosepiece,	**210.00**
FLD3.	With 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**208.00**
FLD4.	FLD 3 and double nosepiece,	**213.00**
FLD5.	With 2 eyepieces and 2 inch, $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives,	**214.00**
FLD6.	FLD 5 and triple nosepiece,	**221.50**
	Fitting cross hairs in other eyepieces,	**1.00**



(Cut one-third actual size.)

M—LABORATORY MICROSCOPE.

Shown as when used as an Inverted Microscope and in the ordinary position.

LABORATORY MICROSCOPE.

M.

The principles involved in the microscope illustrated on the opposite page, are, to the best of our knowledge, entirely new. Although the Inverted Microscope has been used for some time, it does not seem to have occurred to any one to combine this, which is used for special work, with the ordinary vertical instrument. There is no question that the fact that the Inverted could only be used as such, and that it was but incomplete at the best, has precluded it more general use, and we have no doubt that offering it as we do, by combining two instruments in one, and supplying each with such complete adjustments as modern requirements demand, it will be found to fill a necessity in certain branches, and prove a great convenience in others.

In the Inverted Microscope, the usual conditions are reversed. The mirror is above the stage, while the objective is below it, and the object is, therefore, viewed from the lower side instead of from the upper one. After the rays have passed through the objective, they must be given an upward direction so that the image which they form may be viewed; and in order to accomplish this, we make use of a four-sided prism, of which we give a sectional cut, its angles being respectively 57°, 150°, 48°, 105°. The prism is large and its surfaces accurately made so that there is no noticeable depreciation in light and none at all in definition.

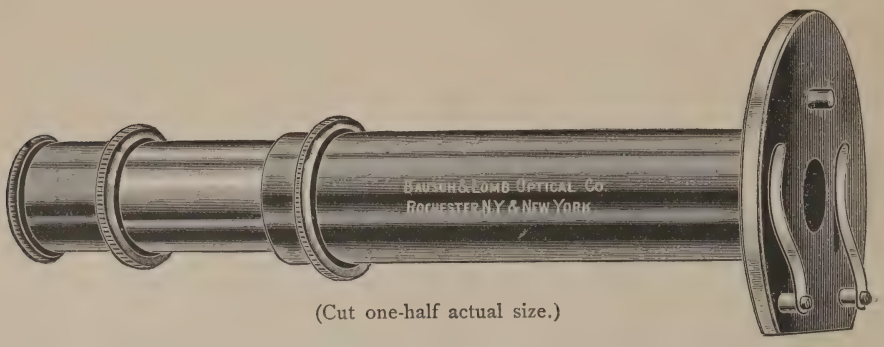
This form of instrument is particularly adapted for chemical investigations, diatomaceæ and other objects in water.

For examinations with low powers, the ordinary slide may be used, but for high powers, a cover glass of proper dimensions may be substituted.

In this misroscope the pillar and arm are japanned. The stage is of solid metal and provided with spring clips. The mirror bar swings on an axis in the plane of the stage, to any point above or below it. The mirrors are plane and concave and adjustable on the mirror bar, as is also the substage. This carries a revolving diaphragm, and is fixed on a pivot so that it will swing in or out of the optical axis. The coarse adjustment is by rack and pinion. The fine adjustment by micrometer screw acting on our patent movement. Attached to the slide is the arm, to the lower side of which is fastened the prism-box. On the horizontal surface is the nosepiece with an extra adapter for high powers. In the oblique surface is a screw socket, to which the tube attaches. This is provided with cloth lining and has draw tube.

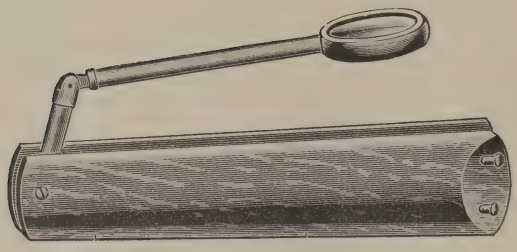
To transform the instrument into an ordinary microscope, the tube is unscrewed. The milled head at the front of the arm loosened, which releases the prism-box, and the arm is swung on its axis from between the pillars into an upright position. The tube is now attached to the opposite side of the nosepiece and, after the clips are reversed, it is ready for work.

M.	Stand (only) with 1 eyepiece, no objectives,	**$45.00**
M1.	With 1 eyepiece and $\frac{4}{4}$ inch and $\frac{1}{6}$ inch objectives,	**64.00**
M3.	With 2 eyepieces and $\frac{4}{4}$ inch and $\frac{1}{6}$ objectives,	**68.00**



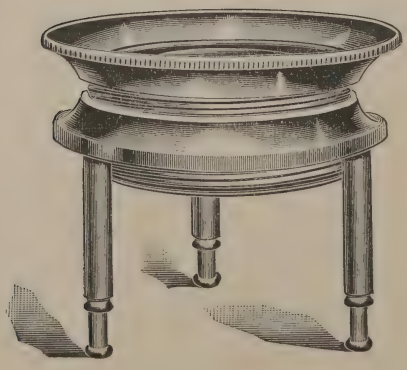
(Cut one-half actual size.)

O—DEMONSTRATION MICROSCOPE.



(Cut two-thirds actual size.)

Q—SAYRE'S POCKET DISSECTING MICROSCOPE.



(Cut actual size.)

QR—SIMPLE MICROSCOPE ON BRASS TRIPOD.

DEMONSTRATION MICROSCOPE.

O.

This microscope, as shown in cut on opposite page, is for class use in demonstrating the structure of objects not requiring a magnifying power of over seventy-five diameters. The objective and eyepiece are carried in a nickeled tube, having nosepiece fitted with society screw; and sliding in cloth-lined main tube to which the stage, which is provided with spring clips for holding the mounted object, and studs on its lower side to protect the object when the microscope is placed on the table in vertical position, is attached. In use the objective is focused on the object and the instrument passed around the class, each observer obtaining a view without disturbing the object or the focus of the objective.

O. With 1 Continental eyepiece, no objective, - - - - - - - - - **$6.00**
O1. O with 1 Continental eyepiece and ⅔ inch objective, Series I, - - - - - **12.00**

SAYRE'S POCKET DISSECTING MICROSCOPE.

Q.

This microscope was designed by Prof. L. E. Sayre, of the University of Kansas, for Students in Botany, and for Students in Pharmacy in the study of Pharmacognosy, both for use in the field and laboratory, and is a most convenient and useful pocket microscope. It consists of a palm piece or handle of such length that the lens and object to be examined, can be held comfortably and easily in one hand, while the other hand is left free to dissect the object or to spread out its parts. The arm or post is cylindrical, very light, and is so hinged and socketed that it can be placed in any position and can be turned at any angle. The lens is of excellent quality and is inserted upon a small post about the length of the palm piece so as to allow it to be over the object examined when held between the thumb and forefinger of the hand which holds the microscope. This microscope will lie firmly upon the table, as the handle is provided with a thin piece of metal, which when turned at right angles to the handle, supports it and the lens in an upright position. Thus the instrument can be used in the laboratory or study for dissections where a low power is required. The arm and lens can be folded into the groove in the palm piece of the handle, when the microscope resembles a pocket knife with the blades closed. Two dissecting needles are neatly fitted into sockets in the handle so that the instrument is complete and ready for work, while it may be carried in the pocket.

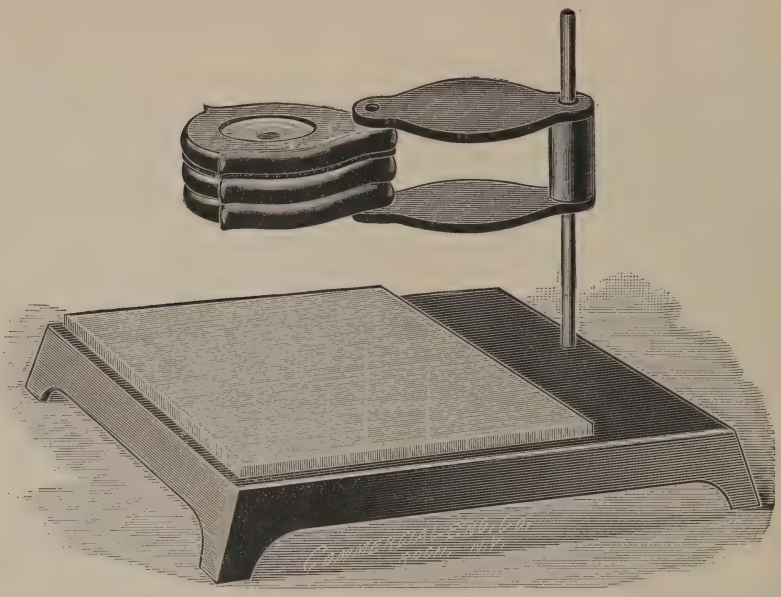
Q. **Sayre's Pocket Dissecting Microscope,** each, - - - - - - - - **$1.50**

SIMPLE MICROSCOPE ON BRASS TRIPOD.

QR.

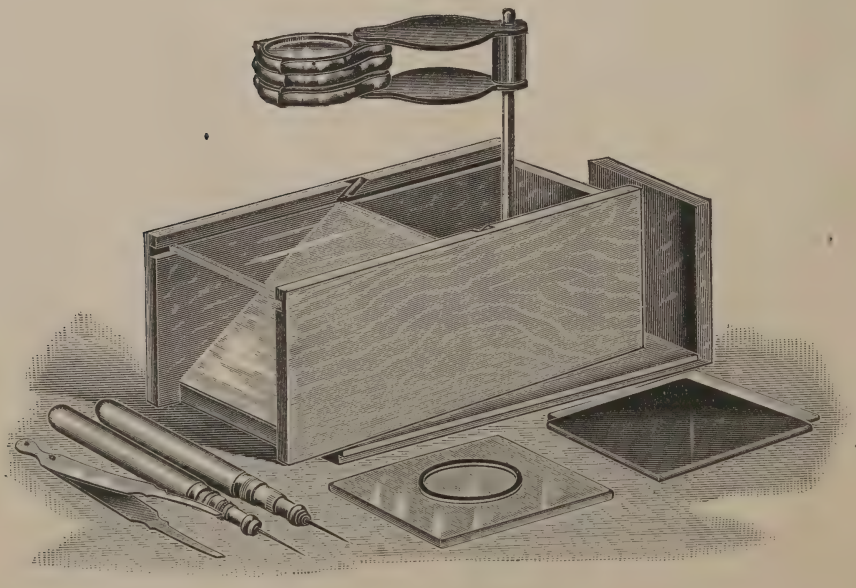
This miscroscope has a large lens of about 1 inch focus mounted in a brass rim which is adjustable for focus by a screw in the frame, and which in turn is supported on three legs. It is a very convenient instrument for elementary work in botany, etc.

QR. **Simple Microscope on Brass Tripod,** - - - - - - - - - **$ .50**



(Cut actual size.)

R—HANDY DISSECTING MICROSCOPE.



(Cut one-half actual size.)

S—IMPROVED EXCELSIOR DISSECTING MICROSCOPE.

HANDY DISSECTING MICROSCOPE.

R.

The dissecting microscope represented on the opposite page is very efficient and convenient for examination of minerals, insects, flowers, etc. It consists of an iron base with glass plate inlaid, forming a white background. A steel stem is screwed into the base plate to which the magnifier is fitted and upon which it slides. The magnifiers furnished are with one, two or three lenses, which give a power of from 5 to 25 diameters. Those with two or three lenses are provided with a diaphragm, which secures distinctness of definition. The stem can be easily unscrewed, and the whole packed in a small box.

Nickel plated pliers are furnished with the instrument.

R1.	With 1 lens (No. 128),	**$1.25**
R2.	With 2 lenses (No. 129),	**1.50**
R3.	With 3 lenses (No. 130),	**2.00**

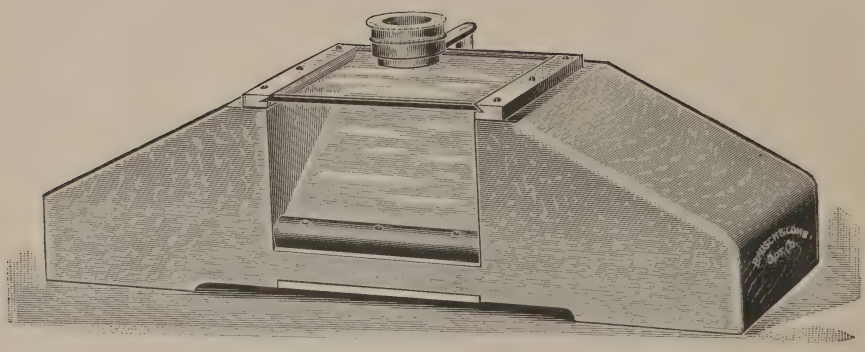
IMPROVED EXCELSIOR DISSECTING MICROSCOPE.

S.

This instrument consists of a small wooden case, 4 x 2 x 1½ inches. One end of the case is attached to the lid, which serves as a cover for the whole. A steel rod, 3¾ inches long, is fitted to the inside of the box, at one side of it, thus being out of the way of the forehead when focusing high or low power lenses. Rubber Magnifiers of one, two or three lenses, giving a range of magnifying power from 5 to 25 diameters, are arranged for adjustment on this rod. A plane mirror 2¼ x 1¼ inches is fitted to one end of the box in a groove, giving the proper angle. A glass stage, 1⅝ x 1¾ inches is adjustable in a groove near the top of the box, and can be replaced by a glass stage with cell, opal glass stage, or black glass stage, of the same size, which are a part of the outfit, the two latter to give white and dark back ground. A straight and bent needle, each in separate needle holder and steel forceps accompanies each microscope.

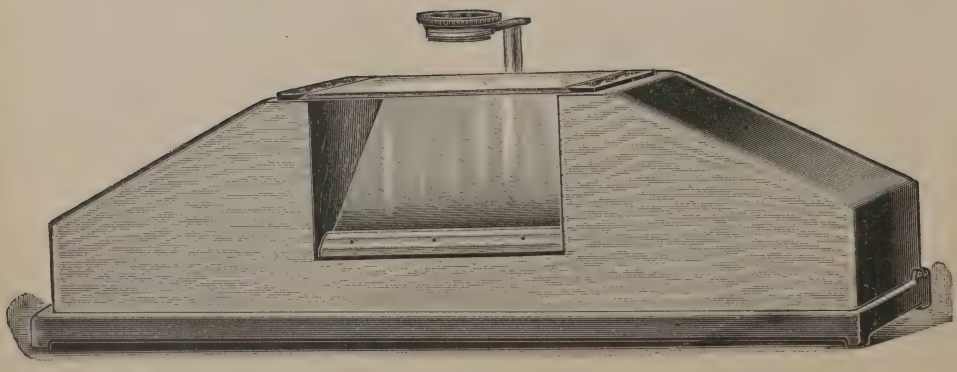
As a portable dissecting microscope for botanical and entomological work this instrument is most efficient. The glass stage, magnifier, and all other parts above mentioned find a place in the case.

S1.	With 1 lens (No. 128),	**$1.00**
S2.	With 2 lenses (No. 129),	**1.25**
S3.	With 3 lenses (No. 130),	**1.50**



(Cut one-third actual size.)

T2—BARNES' DISSECTING MICROSCOPE.



(Cut one-third actual size.)

TTI—IMPROVED BARNES' DISSECTING MICROSCOPE.

BARNES' DISSECTING MICROSCOPE.

T.

This microscope was designed by Prof. C. R. Barnes, of the University of Wisconsin, and has been used in his and many other laboratories for several years with very satisfactory results. It is a most effective and low priced dissecting instrument. The body is a solid block of wood so shaped that the sides serve the purpose of hand rests. A mirror and movable glass stage plate are provided for in a simple manner. A plate also accompanies the microscope, having on one side a white and on the other side a black surface for examining dark or light objects. The block has receptacle for this plate when not in use. The lens holder slides in a brass tube driven into a hole in the block. This microscope is regularly furnished with dissecting lenses of series A, but other series can be used on it.

T1.	With 1 lens (Series A) of 1 inch focus,	**$2.50**
T2.	With 2 lenses (Series A) of 2 inch and 1 inch focus,	**3.25**
	Single Lenses (Series A) of ¾ inch, ½ inch or ¼ inch focus, each,	**.75**
	Triple Arm for carrying 3 lenses, arranged so that all lenses focus in same plane,	**1.50**
	Coddington Lenses (Series C) in suitable mounting, each,	**2.00**

IMPROVED BARNES' DISSECTING MICROSCOPE.

TT.

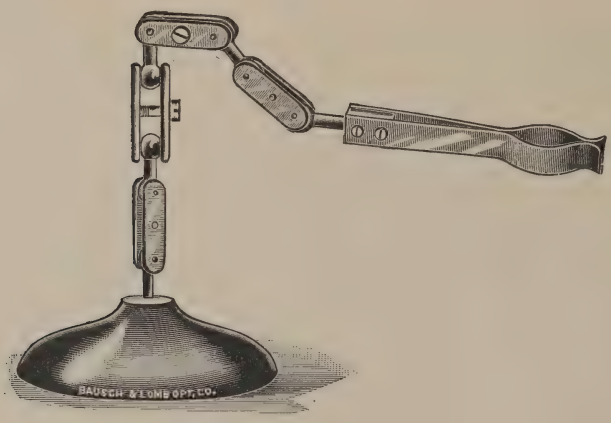
The microscope consists primarily of a block of light wood nicely finished in oil and with the sides shaped to form hand-rests. This block is attached to a japanned iron base by means of hinges, as shown in the cut, so that it may be turned back upon the base which forms a tray in which forceps, scalpels, dissecting needles and extra lenses may be kept; the instruments being covered by the wooden block when the microscope is in use. The large glass stage plate is removable. Suitable illumination is secured by a large plane mirror. A plate with one white and one black surface, and which fits into grooves under the stage, accompanies each microscope, to be used when black or white background is desired. The plate, when not in use, may be placed in the tray under the block.

The lens holder slides in brass sleeve and is fitted with sufficient delicacy to permit of accurate focusing of the lens.

This microscope will be found very useful and economical where classes are to be equipped for botanical or ordinary zoölogical work, as it combines all the essentials of a dissecting microscope, viz.: a good lens in a convenient holder with an ample stage, well illuminated; the whole on a firm base with immovable rests for the hands.

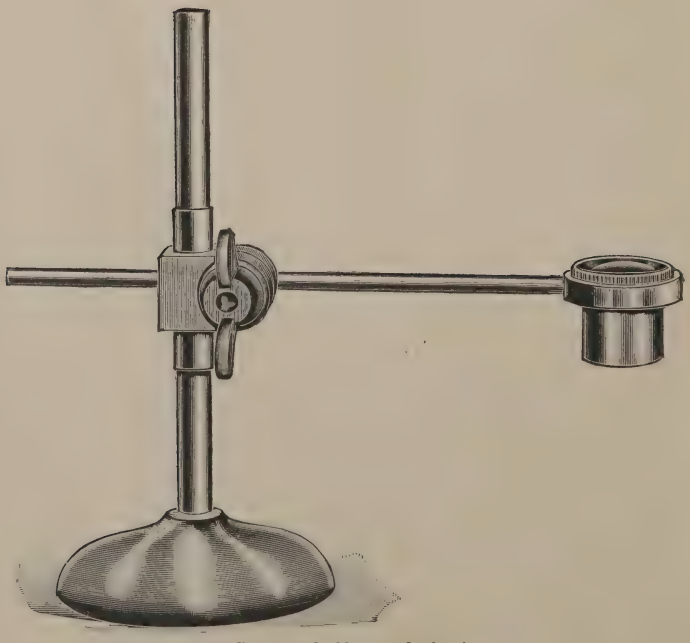
Lenses of Series A are regularly furnished with this microscope, but other series, as listed below, can be used.

TT1.	With 1 lens (Series A) of 1 inch focus,	**$3.00**
TT2.	With 2 mounted lenses (Series A) of 2 inch and 1 inch focus,	**3.75**
	Single Lenses (Series A) of ¼, ½ or ¾ inch focus, each,	**.75**
	Coddington Lenses (Series C) in suitable mountings, each,	**2.00**
	Triple Arm for carrying 3 lenses, arranged so that all lenses focus in same plane,	**1.50**



(Cut one-half actual size.)

TS—DISSECTING STAND.



(Cut one-half actual size.)

TU—DISSECTING STAND.

N. B.—The lens shown is not part of the stand, and is furnished at an extra cost

DISSECTING STAND AND LENS HOLDER.

TS.

The base is of japanned iron, to which is attached the articulated arm carrying the lens holder. The construction of the arm is such that it can be bent to any conceivable angle and rotated on its axis as desired, always remaining adjusted in the position in which it is placed. This flexibility is accomplished by making the alternate sections of the arm of two metal plates connected by a tightening screw and forming a ball bearing at each end with the intermediate bars. The lens holder will receive almost any sort of lens, hence this Dissecting Stand may be made a part of the laboratory furniture, with which students may use their own lenses or they may be fitted with the lenses listed in this catalogue.

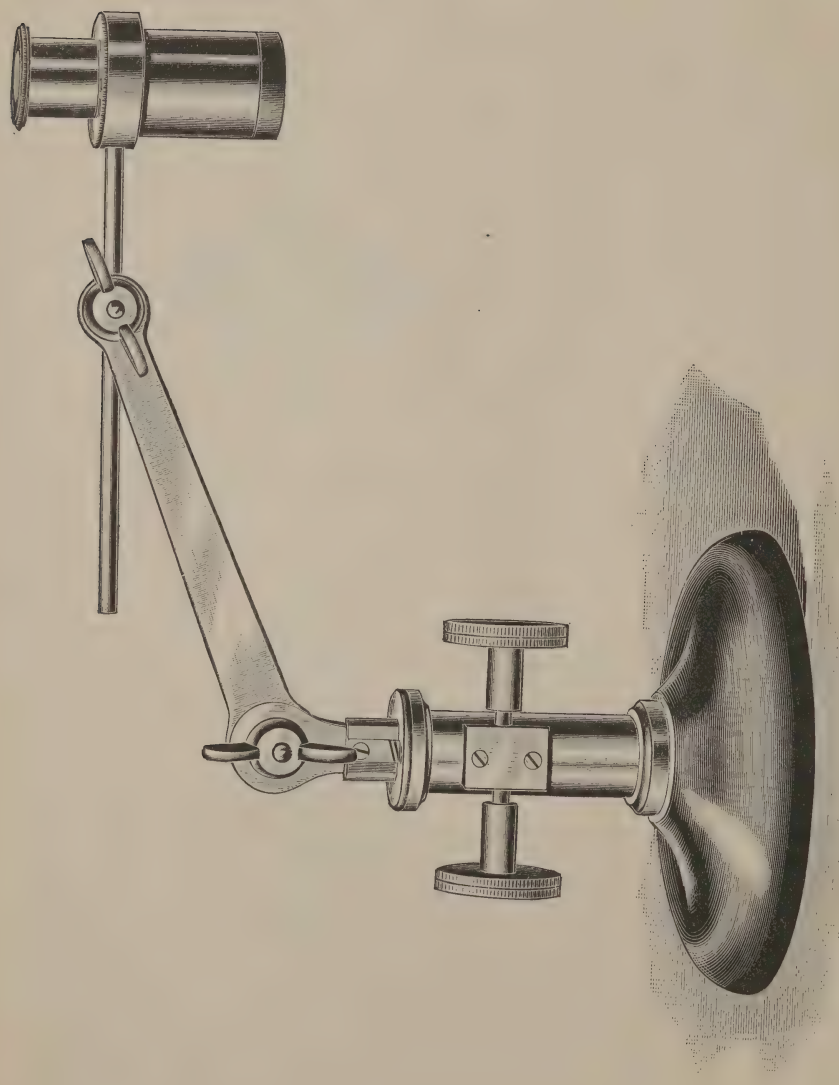
TS. **Dissecting Stand** and Lens Holder, - - - - - - **$3.00**

DISSECTING STAND.

TU.

This stand is simple and provides convenient means for adjustment in vertical and horizontal direction. The base is circular and of japanned iron. The pillar is nickeled brass 135 mm. high, upon which slides the clamp carrying in its turn, in the axis of the clamping screw, the steel lens carrying rod, 150 mm. long, which may be swung on the axis, rotated or extended horizontally. The binding screw binds the rod and the clamp on the vertical stem with one motion. The brass parts are all nickel plated. Any of the dissecting lenses may be used on this instrument, but we would especially recommend the low power Bruecke type.

TU. **Dissecting Stand,** - - - - - - - - **$4.50**



(Cut one-half actual size.)

TUS—DISSECTING STAND.

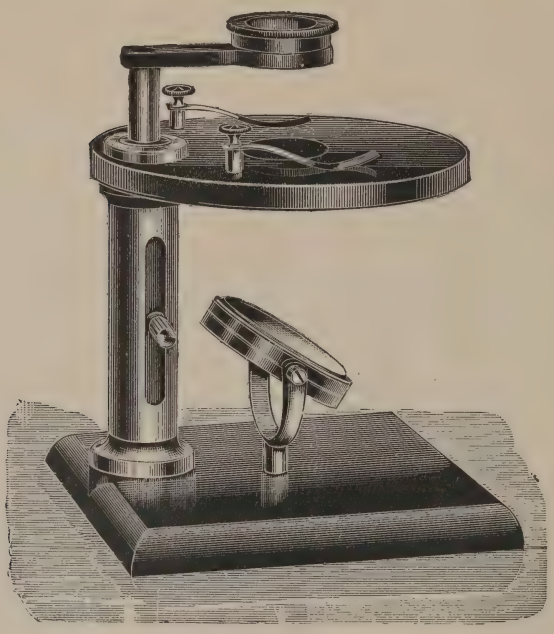
The lens shown is not a part of the Stand but is furnished at an extra cost.

DISSECTING STAND.

TUS.

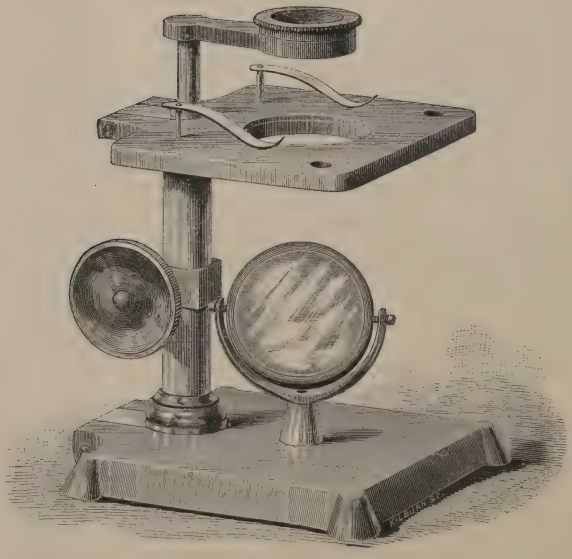
This instrument is of more elaborate construction and provides within a wide range adjustments for the lenses in every possible direction. It is solidly built, with easy and convenient means of adjustment. The base is large and heavy, of japanned iron. The pillar is provided with triangular rod and has delicate diagonal rack and pinion adjustment. In the upper portion of the rod is fitted the milled head, carrying the brass arm, which in turn carries at its extremity the steel lens carrying rod. Both of the axes may be tightened by means of convenient thumb screws, but may also be so set as to form easy means of adjustment and still remain rigid, a special construction having been introduced which prevents these joints from working tight or wearing out. The head may be revolved in the triangular rod and clamped by means of a screw. All of the brass parts are nickel plated. This microscope was designed for use principally with the Compound Dissecting Lens (Bruecke type) of low power, but any of the other dissecting lenses may be used with it.

TUS. Dissecting Stand, - - - - - - - - - **$10.00**



(Cut one-half actual size.)

U—EDUCATIONAL DISSECTING MICROSCOPE.



(Cut one-third actual size.)

V—FOLDING DISSECTING MICROSCOPE.

EDUCATIONAL DISSECTING MICROSCOPE.

U.

This instrument has been especially designed for class and laboratory use and is of the utmost simplicity, nothing, however, having been sacrificed to thorough efficiency. The base is of japanned iron with pillar of finished brass containing the sliding rod provided with projecting pin for focusing the lenses. The arm is adjustable in the rod. The stage is of bronzed brass provided with spring clips. The mirror is concave with the reverse side a white opaque surface. The instrument is supplied in cherry case with handle. Any of the dissecting lenses may be used on this instrument.

U.	Stand, as above,	**$6.00**
	Arm for Lenses, with joint, in place of small arm, extra,	**1.00**
	Triple Arm for carrying 3 lenses, arranged so that all lenses focus in same plane,	**1.50**
	Circular Glass Stage, attachable to brass stage, extra,	**2.00**
	Metal Hand Rests, per pair,	**1.25**

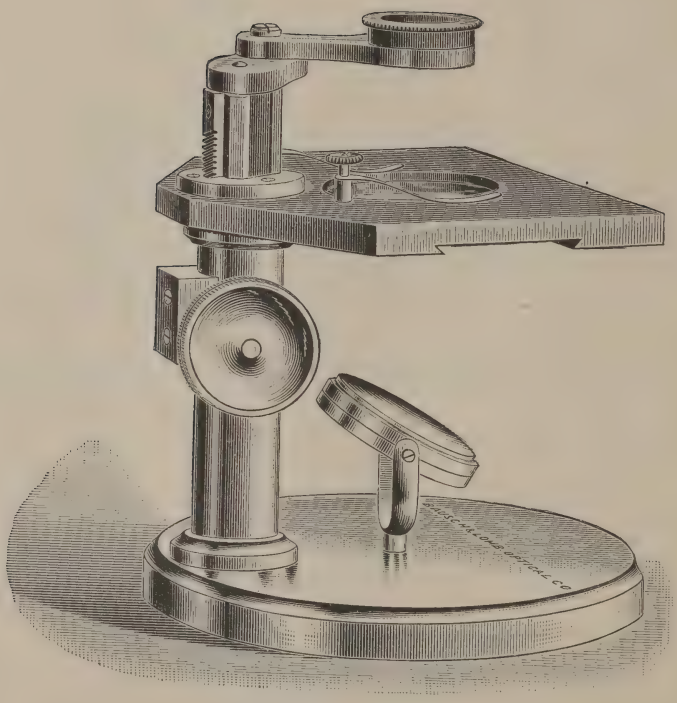
FOLDING DISSECTING MICROSCOPE.

(Pat. Aug. 3, 1880.)

V.

This instrument is compact, portable and efficient. It has all the elements of the ordinary dissecting microscopes, and besides these, the important feature that, when folded, it is brought into a very small compass. The base is japanned iron. The stage is of brass, blackened; has spring clips and, in its center, a removable glass disc with millimeter scale ruled upon it. It is of convenient height so that any amount of work may be done without fatigue. The arm holding the lenses is adjustable in the triangular rack-rod, and has society screw, thus permitting the use of low power objectives as simple magnifiers. The diagonal rack and pinion gives a perfectly smooth adjustment. The mirror is detachable from the base and can be readily attached to the stage for illumination of opaque objects. The brass work is all highly finished and lacquered. In folding, the rack is brought down and arm detached; the stage swings backward on the pillar, and the base on the stage so that the space occupied is merely the size of the base and thickness of base, stage and arm. The instrument is supplied in cherry case. Any of the dissecting lenses may be used on this instrument.

V.	Stand, as above,	**$10.00**
	Arm for Lenses, with joint in place of single arm, extra,	**1.00**
	Triple Arm for carrying 3 lenses, arranged so that all lenses focus in same plane,	**1.50**
	Metal Hand Rests, per pair,	**1.25**



(Cut one-half actual size.)

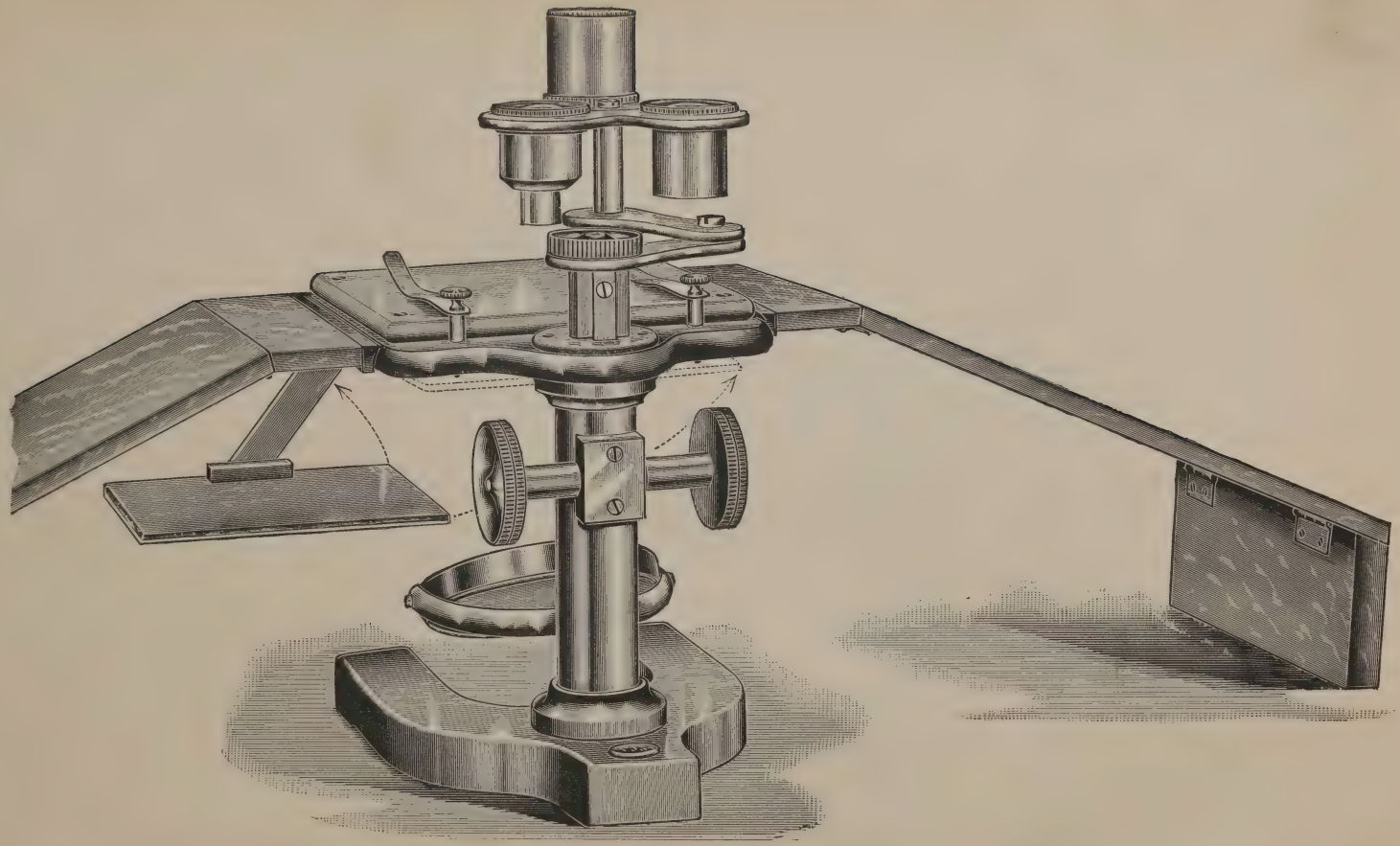
W—LABORATORY DISSECTING MICROSCOPE.

LABORATORY DISSECTING MICROSCOPE. W.

This instrument is designed for use in laboratories. For this purpose it is made of great stability with large and delicate bearings in its adjustments. It is entirely of brass, highly polished. The base is large and circular and the stage is of the same large dimensions. The upper surface of the stage is blackened and provided with spring clips; a glass disc with millimeter scale is placed in the central opening, and the lower side is grooved to receive hand rests. The adjustment is by diagonal rack and pinion, acting on large triangular rod. The mirror frame is provided on one side with concave mirror, and white glass disk on the other. The mirror is detachable from the base and may be attached to the stage to illuminate opaque objects. The arm is adjustable in the triangular rod and is provided with society screw. A jointed arm may replace this at an additional price. The instrument is supplied in cherry case.

Any of the dissecting lenses can be used on this instrument.

W.	Stand, as above,	**$9.00**
	Arm for Lenses, with joint in place of single arm, extra,	**1.00**
	Triple Arm for carrying 3 lenses, arranged so that all lenses focus on the same plane,	**1.50**
	Metal Hand Rests, per pair,	**1.25**
	Wooden Hand Rests, as shown in cut of **Y**, per pair,	**2.00**



(Cut one-half actual size.)

Y—DISSECTING MICROSCOPE.

Fitted with revolving lens holder and three lenses arranged to focus in same plane. Lenses and Revolving Lens Holder are not a part of the stand but are furnished at an extra cost.

DISSECTING STAND.

Y.

This instrument is made after the **Paul Meyer** pattern, with such changes in construction as have been recommended to increase its usefulness. It is throughout larger and firmer than any of the other dissecting stands listed, and is believed to offer **advantages not possessed** by **other instruments** of its kind.

The metal parts are brass throughout, highly polished and **nickeled.**

The base is of unusually **large size** and heavily leaded to **insure stability.**

The stage plate, 90 x 105 mm. in size, is of heavy polished plate glass, resting on a metal frame into which the spring clips are also fastened, thus making the entire **surface** of the **stage free** and **available** for work. Dishes may be cemented to its surface or re-agents used upon it without fear of damaging it in any way.

The **mirrors** are **very large,** 68 mm. in diameter, plane and concave.

The usual somewhat cumbersome methods of **securing black** or **white backgrounds** are superseded in this stand by a plate, black on one side, white on the other, hinged to the stage frame, just beneath the front left hand corner by means of an arm of the proper length to bring the plate (black or white side up as desired) directly in contact with the lower surface of the stage, or permitting it to be carried outward beneath and against the hand rests. When transmitted white light is wanted the arm of the plate is brought to the vertical position and the white side of the plate used as a reflector or this arrangement of the plate does not in any way interfere with the illumination or the use of the camera lucida. The plate being a part of the instrument, is always at hand, and can be instantly brought into use.

The **lenses** are **focused** by means of **diagonal rack** and **pinion,** of **extreme long range,** acting on a triangular rod. The **working distance** may be **increased** to **125 millimeters** by means of a second rod attached to the arm and adjustable in the main focusing rod.

Our illustration shows the microscope fitted with the **revolving lens carrier** and plain **jointed arm,** which accessory is listed separately and **does not form a part** of the **regular stand.** The stand is usually supplied with a jointed arm, with lens carrier at its extremity, and with socket, binding screw and accessory **arm for** attaching the **Abbe Camera Lucida.** Our Abbe Camera Lucida No. 1880 gives the best results on this stand. The hand rests are of highly finished wood, folding and detachable. They are attached to the microscope at such an angle that the arms rest upon them naturally, placing the user in a comfortable position for long continued work.

The **Hastings Aplanatic Lenses** and **Compound Dissecting Lens** described on page 71 are **especially recommended** for use with this stand. These lenses are made **par-focal** for use with the **revolving lens holder.** They give the best results with the Abbe Camera Lucida also.

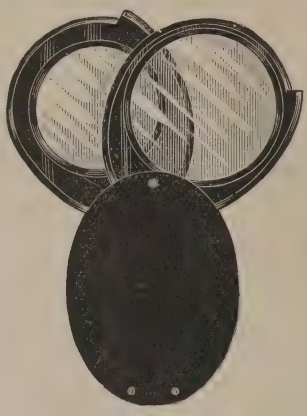
This Microscope is furnished in a **polished case** with handle and lock and with **receptacles** for the hand rests **and** such **accessories** as may be **ordered** with the microscope.

Y1.	Dissecting stand with jointed arm for lens, provision for Camera Lucida and with hand rests, in case, with one Aplanatic Triplet, Series D, any power,	**$36.00**
Y2.	Y 1 and Abbe Camera Lucida, No. 1880,	**48.00**
Y3.	Y 2 and Triple Revolving Lens Carrier, No. 1540,	**53.00**
Y4.	Dissecting stand with jointed arm for lens, provision for attaching Camera Lucida and with hand rests, in case—with one Hastings Aplanatic Triplet, Series E,	**39.00**
Y5.	Y 4 and Abbe Camera Lucida, No. 1880,	**51.00**
Y6.	Y 5 and Triple Revolving Lens Carrier, No. 1540,	**56.00**

For other lenses see pages 69, 70, 71 and 72.

POCKET MAGNIFIERS.

No. **50.**



No. **51.**

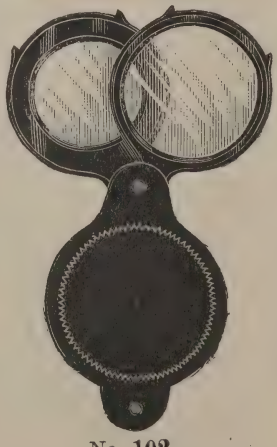
Magnifiers, Folding, oval shape, in rubber case, with 1 lens.

Cat. No.	**50**	**56**	**62**	**68**	**74**	**78**
Diam. of Lens,	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2 inches.
Price, each,	**$ .30**	**.40**	**.60**	**.70**	**.90**	**1.15**

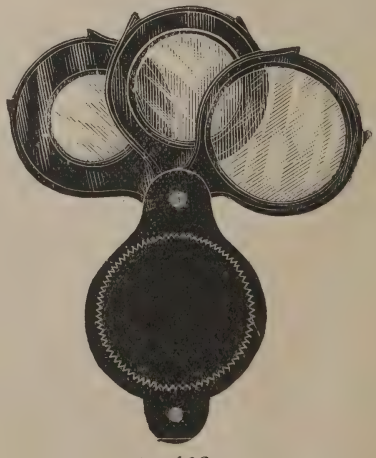
Magnifiers, Folding, oval shape, in rubber case, with 2 lenses.

Cat. No.	**51**	**57**	**63**	**69**	**75**	**79**
Diam. of Lens,	$\frac{3}{4}$ & $\frac{3}{4}$	$\frac{7}{8}$ & 1	$1\frac{1}{8}$ & $1\frac{1}{4}$	$1\frac{1}{4}$ & $1\frac{1}{2}$	$1\frac{1}{2}$ & $1\frac{3}{4}$	$1\frac{3}{4}$ & 2 inches.
Price, each,	**$ .50**	**.65**	**.85**	**1.10**	**1.65**	**2.15**

No. **101.**



No. **102.**



No. **103.**

Magnifiers, Folding, bellows shape, in rubber case, with 1 lens.

Cat. No.	**101**	**110**	**119**
Diam. of Lens,	$\frac{3}{4}$	$\frac{7}{8}$	1 inch.
Price, each,	**$ .40**	**.50**	**.60**

Magnifiers, Folding, bellows shape, in rubber case, with 2 lenses.

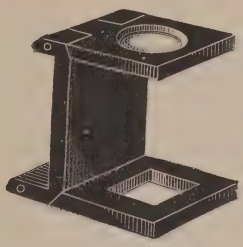
Cat. No.	**102**	**111**	**120**
Diam. of Lens,	$\frac{5}{8}$ & $\frac{3}{4}$	$\frac{3}{4}$ & $\frac{7}{8}$	$\frac{7}{8}$ & 1 inch.
Price, each,	**$ .60**	**.75**	**1.00**

Magnifiers, Folding, bellows shape, in rubber case, with 3 lenses.

Cat. No.	**103**	**112**	**121**
Diam. of Lens,	$\frac{1}{2}$, $\frac{5}{8}$ & $\frac{3}{4}$	$\frac{5}{8}$, $\frac{3}{4}$ & $\frac{7}{8}$	$\frac{3}{4}$, $\frac{7}{8}$ & 1 inch.
Price, each,	**$ .80**	**1.00**	**1.30**

MAGNIFIERS.

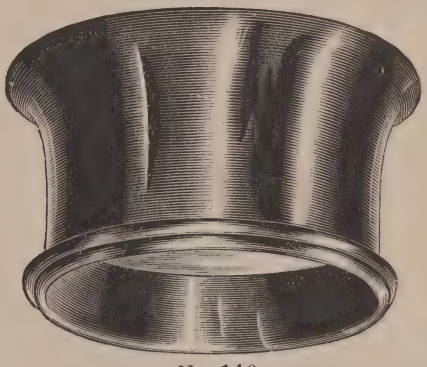
No. **144.**



No. **143.**

No. **144 A.**

No. **144½.**



No. **146.**

No.		Price.
141.	**Linen Testers,** brass, with 1 inch open square,	**$1.75**
142.	**Linen Testers,** brass, with ¼ x ½ inch open square,	**.40**
143.	**Linen Testers,** brass, with ¼ inch open square,	**.40**
143½.	**Linen Testers,** brass, with round opening,	**.40**
141N.	**Linen Testers,** brass, nickel plated, with 1 inch open square,	**2.50**
142N.	**Linen Testers,** brass, nickel plated, with ¼ x ½ inch open square,	**.60**
143N.	**Linen Testers,** brass, nickel plated, with ¼ inch open square,	**.60**
143½N.	**Linen Testers,** brass, nickel plated, with round opening,	**.60**
144.	**Watchmaker Glass,** one lens, 2½ inch focus,	**.40**
144½.	**Watchmaker Glass,** one lens, 1 inch focus,	**.40**
144A.	**Watchmaker Glass,** two lenses, giving two powers,	**.75**
144 L. P.	**Watchmaker Glass,** with spring, one lens, 2½ inch focus,	**.60**

Engraver Glass, with two plano convex lenses.

Cat. No.	**145**	**146**	**147**	**148**	
Diam. of lens,	1⅜	1⅝	1⅞	2⅛	inches.
Price, each,	**$2.00**	**2.50**	**3.00**	**3.75**	

Engraver Glass, with one double convex lens.

Cat. No.	**145A**	**146A**	**147A**	**148A**	
Diam. of lens,	1⅜	1⅝	1⅞	2⅛	inches.
Price, each,	**$ .75**	**1.10**	**1.50**	**1.90**	

Engraver Glass, with double achromatic lenses, very strong focus.

Cat. No.	**146DA**	**146DA**	**146DA**	**146DA**	**146DA**	
Diam. of lenses,	1⅜	1⅝	1⅝	1⅝	1⅝	inches.
Combined Focus,	1	1¼	1½	1¾	2	inches.
Price, each,	**$8.00**	**7.25**	**6.50**	**6.00**	**5.40**	

Magnifiers, Folding, oval shape, in aluminum case.

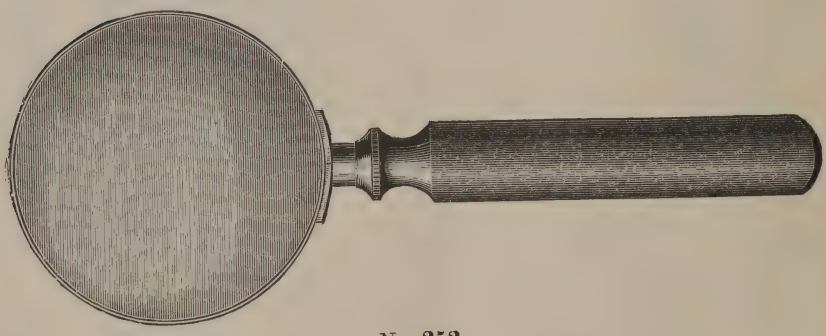
Cat. No.	56A	101A	110A	102A	111A
No. of lenses,	1	1	1	2	2
Diam. of lens,	1	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{5}{8}$, $\frac{3}{4}$	$\frac{3}{4}$, $\frac{7}{8}$ inch.
Price, each,	$ .75	.75	.90	1.00	1.25

Magnifiers, Folding, oval shape, in white celluloid case.

Cat. No.	50Z	56Z	62Z	51Z	57Z	63Z
No. of lenses,	1	1	1	2	2	2
Diam. of lenses,	$\frac{3}{4}$	1	$1\frac{1}{4}$	$\frac{5}{8}$, $\frac{3}{4}$	$\frac{7}{8}$, 1	$1\frac{1}{8}$, $1\frac{1}{4}$ inches.
Price, each,	$ .75	.90	1.10	1.00	1.25	1.50

Magnifiers, Folding, bellows shape, in rubber case, with diaphragm.

Cat. No.	128	129	130
No. of lenses,	1	2	3
Diam. of lenses,	$\frac{5}{8}$	$\frac{5}{8}$, $\frac{3}{4}$	$\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ inches.
Price, each,	$ .50	.75	1.25



No. 252.

Reading Glasses, nickel plated rims and black enameled wood handle.

Cat. No.	252	254	256	258	260	261	262	263	264
Diam. of lens,	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 inches.
Price, each,	$ .80	1.00	1.50	2.00	2.50	3.25	4.00	5.00	6.00

Reading Glasses, nickel plated rims and white celluloid handles.

Cat. No.	270	272	274	276	278	279	280	281	282
Diam. of lens,	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 inches.
Price, each,	$1.20	1.40	2.00	2.75	3.25	4.60	5.00	6.00	7.00

Reading Glasses, gold plated rims and amber celluloid handles.

Cat. No.	290	292	294	296	298	299	300	301	302
Diam. of lens,	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 inches.
Price, each,	$1.50	1.75	2.50	3.25	3.75	4.00	5.75	6.75	8.00

Reading Glasses, gold plated rims, white or oriental pearl handles.

Cat. No.	310	311	312	313	314	315	316	317
Diam. of lens,	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6 inches.
Price, each,	$3.00	3.50	4.00	5.00	6.00	7.00	8.50	10.00

Nos. **1 to 4.**
SINGLE LENSES.
Showing two lenses and method of combining to form a higher power.

No. **10.**
DOUBLE ACHROMATIC LENS.

SERIES **A**—SINGLE LENSES.

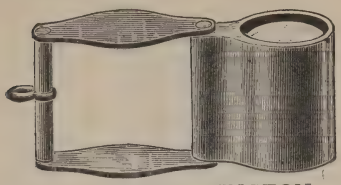
Of simple construction, composed of a perfectly centered double convex lens, giving good definition and a fairly flat field. The mountings are so arranged that the lenses may be used singly or in conjunction. They are best suited to the dissecting microscopes T and TT, but can be used on any of the other instruments.

NO.	MAGNIFICATION.	FOCAL LENGTH.		PRICE.
		Inches.	mm.	
1	7	1½	37	**$ .75**
2	10	1	12.5	**.75**
3	14	¾	18	**.75**
4	20	½	25	**.75**

SERIES **B**—DOUBLE ACHROMATIC LENS.

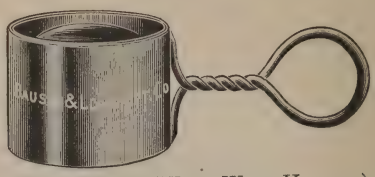
Composed of two achromatic systems set in brass mounting, nickel plated, giving a large flat field with perfect definition. It is made especially for dissecting work where large field is required and is adapted to our Y dissecting microscope or to any of the other types when used with an arm of suitable size.

NO.	MAGNIFICATION.	FOCAL LENGTH.		PRICE.
		Inches.	mm.	
10	5	2	50	**$4.50**

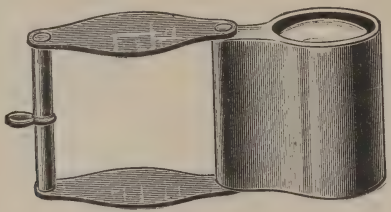


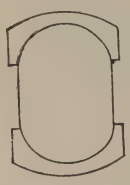
POCKET CODDINGTON.
Nos. **15 to 18.**

SECTION OF LENS.



CODDINGTON (WITH WIRE HANDLE).
Nos. **20 to 23.**





APLANATIC TRIPLET. SECTION OF LENS.
Nos. **30 to 32.**

SERIES C—CODDINGTON LENSES.

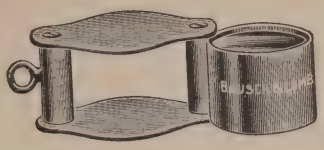
These lenses are of the best possible construction and are not to be confounded with the crude foreign article or the so-called Coddingtons consisting of two plano convex lenses. They are made with great care throughout and are mounted in substantial German silver cases. Although the size of field is limited, it is flat and the definition excellent. Nos. 15 to 18 are adapted to any of our dissecting microscopes by special mounting without extra cost.

NO.		MAGNIFICATION.	FOCAL LENGTH.		PRICE.
			Inches.	mm.	
15	German Silver Mounting in Folding Case.	7	$1\frac{1}{2}$	37	**$2.00**
16		10	1	25	**2.00**
17		14	$\frac{3}{4}$	18	**2.00**
18		20	$\frac{1}{2}$	12.5	**2.00**
20	German Silver Mounting with Wire Handle.	7	$1\frac{1}{2}$	37	**1.50**
21		10	1	25	**1.50**
22		14	$\frac{3}{4}$	18	**1.50**
23		20	$\frac{1}{2}$	12.5	**1.50**

SERIES D—APLANATIC TRIPLETS.

These lenses are of new construction, and are thoroughly achromatic systems composed of one crown and two flint glass lenses cemented together. The image given by them is clear and sharp, making them especially valuable for preliminary examinations where powers up to twenty diameters are required. They give large field, have great depth of focus, and perfect definition, even when the optical axis is held at great obliquity. They can be used with any of our dissecting microscopes, and when so ordered will be in a suitable mounting.

NO.	MAGNIFICATION.	FOCAL LENGTH.		PRICE.
		Inches.	mm.	
30	10	1	25	**$4.00**
31	14	$\frac{3}{4}$	18	**4.00**
32	20	$\frac{1}{2}$	12.5	**4.00**



SERIES E—HASTINGS APLANATIC TRIPLETS.

After a new formula by Professor Charles S. Hastings, of Sheffield Scientific School, Yale University.

The essentials for a good, simple microscope are,

A LARGE ANGULAR FIELD FREE FROM COLOR ERRORS and LONG WORKING DISTANCE.

If the lens is to be used without a stand or fixed holder, a **symmetrical construction** is also imperative in order that an **undistorted image** may be obtained even when the optical axis is at considerable obliquity to the plane of the object. These rather difficult requirements were first met in a satisfactory way by Dr. Steinheil in his aplanatic triplet, of which our series D triplets and those of Tolles are modification. The series described below has been designed from a much **larger choice** of **optical glasses** than could be commanded by the earlier opticians, and is thought to meet the practical requirements with substantial perfection.

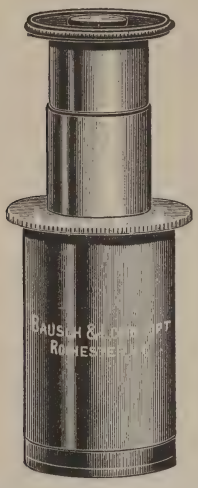
A larger field than that supplied could hardly be used, and the **working distance** is nearly as **great** as that of a simple lens of the same power.

For use as a **pocket lens** the powers **6.7** and **10** are **especially recommended,** the first perhaps superior in general utility, and the second of a more convenient size.

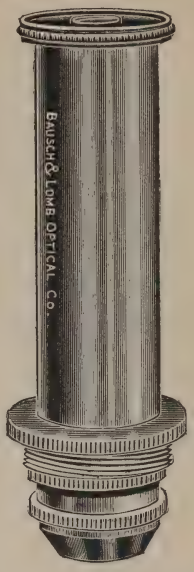
Five powers may be regarded as a sufficient range to fairly exhaust the capabilities of the system. **Higher magnifications** can be more **conveniently obtained** with the **Compound Bruecke Lenses,** which we list elsewhere, while those lower than the lowest would in few cases be sufficiently superior to a simple lens to compensate for the difference in cost.

These **lenses** are **mounted** in a very **neat** and carefully designed **case** of German silver, the outer case not depending for its stability on rivited joints, etc., but on a nicely made frictional hinge which **will not wear loose** or become defective. When desired for the dissecting microscope they will be furnished in suitable mounting **without extra cost.**

NO.	MAGNIFICATION.	FOCAL LENGTH.		REAL FIELD MM.	PRICE.
		Inches.	Mm.		
35	5	2	51.0	40.0	**$7.00**
36	6.7	1½	38.0	30.0	**7.00**
37	10	1	25.0	20.0	**7.00**
38	15	¾	19.0	14.0	**7.00**
39	20	½	13.0	7.5	**7.00**



(Cut two thirds actual size.)
COMPOUND DISSECTING LENS.
LOW POWER.
No. **40.**



(Cut actual size.)
COMPOUND DISSECTING LENS.
HIGH POWER.
No. **42.**

SERIES F—COMPOUND DISSECTING LENS (Bruecke Type.)

LOW POWER.

The field lens of this magnifier consists of two achromatic systems of long focus, the image being magnified by an eyepiece adjustable in the tube, by means of which the magnifying power of the combination may be varied from 5 to 10 diameters.

The working distance varies from $2\frac{1}{3}$ to 3 inches (60–75 mm.), according to the magnification used.

This lens is of great value in both vertebrate and invertebrate dissection, on account of its very long working distance, large field, giving abundant illumination without the use of mirror or condensing lens, and the range of its magnifying power.

It is especially designed for use with the stands TS, TU, and TUS.

No. **40. Compound Dissecting Lens** (Bruecke Type), - - - - - **$10.50**

SERIES C—COMPOUND DISSECTING LENS (Bruecke Type.)

HIGH POWER.

The objective consists of three achromatic lenses and an achromatic eye lens. The power may be varied from 15 to 100 diameters by unscrewing the third and second lenses of the objective or by removing the eye lens and tube. The objectives may be used as simple magnifiers, single, double or triple systems. The focal distance with either is ample for dissecting purposes. This lens may be used on any of our dissecting microscopes. It gives excellent results with the Camera Lucida.

NO.	WORKING COMBINATIONS.	MAGNIFICATION, DIAMETERS.	WORKING DISTANCE.	PRICE.
42	3 lenses with eyepiece.	100	8 mm. to 28 mm. according to power used.	**$13.50**
	2 " " "	60		
	1 " " "	40		
	3 lenses only.	30		
	2 " "	20		
	1 " "	15		

APERTURE TABLE

(Reprint from "The Journal of the Royal Microscopical Society.")

APERTURE. ($n \sin u = a$.)	Corresponding Angle ($2u$) for Air ($n = 1.00$.)	Corresponding Angle ($2u$) for Water ($n = 1.33$.)	Corresponding Angle ($2u$) for Homogeneous Immersion ($n = 1.52$.)	Limit of Resolving Power, in Lines to an Inch. White Light. ($\lambda = 0{\cdot}5269\ \mu$, Line E.)	Limit of Resolving Power, in Lines to an Inch. Monochromatic (Blue) Light ($\lambda = 0{\cdot}4861\ \mu$, Line F.)	Limit of Resolving Power, in Lines to an Inch. Photography ($\lambda = 0{\cdot}4000\ \mu$, Near Line h.)	Illuminating Power. (a^2.)	Penetrating Power $\left(\frac{1}{a}\right)$
1.52	..	..	180° 0′	146,543	158,845	193,037	2.310	.658
1.51	..	..	166° 51′	145,579	157,800	191,767	2.280	.662
1.50	..	..	161° 23′	144,615	156,755	190,497	2.250	.667
1.49	..	..	157° 12′	143,651	155,710	189,227	2.220	.671
1.48	..	..	153° 39′	142,687	154,665	187,957	2.190	.676
1.47	..	..	150° 32′	141,723	153,620	186,687	2.161	.680
1.46	..	..	147° 42′	140,759	152,575	185,417	2.132	.685
1.45	..	..	145° 6′	139,795	151,530	184,147	2.103	.690
1.44	..	..	142° 39′	138,830	150,485	182,877	2.074	.694
1.43	..	..	140° 22′	137,866	149,440	181,607	2.045	.699
1.42	..	..	138° 12′	136,902	148,395	180,337	2.016	.704
1.41	..	..	136° 8′	135,938	147,350	179,067	1.988	.709
1.40	..	..	134° 10′	134,974	146,305	177,797	1.960	.714
1.39	..	..	132° 16′	134,010	145,260	176,527	1.932	.719
1.38	..	..	130° 26′	133,046	144,215	175,257	1.904	.725
1.37	..	..	128° 40′	132,082	143,170	173,987	1.877	.729
1.36	..	..	126° 58′	131,118	142,125	172,717	1.850	.735
1.35	..	..	125° 18′	130,154	141,080	171,447	1.823	.741
1.34	..	..	123° 40′	129,189	140,035	170,177	1.796	.746
1.33	..	180° 0′	122° 6′	128,225	138,989	168,907	1.769	.752
1.32	..	165° 56′	120° 33′	127,261	137,944	167,637	1.742	.758
1.30	..	155° 38′	117° 35′	125,333	135,854	165,097	1.690	.769
1.28	..	148° 42′	114° 44′	123,405	133,764	162,557	1.638	.781
1.26	..	142° 39′	111° 59′	121,477	131,674	160,017	1.588	.794
1.24	..	137° 36′	109° 20′	119,548	129,584	157,477	1.538	.806
1.22	..	133° 4′	106° 45′	117,620	127,494	154,937	1.488	.820
1.20	..	128° 55′	104° 15′	115,692	125,404	152,397	1.440	.833
1.18	..	125° 3′	101° 50′	113,764	123,314	149,857	1.392	.847
1.16	..	121° 26′	99° 29′	111,835	121,224	147,317	1.346	.862
1.14	..	118° 0′	97° 11′	109,907	119,134	144,777	1.300	.877
1.12	..	114° 44′	94° 55′	107,979	117,044	142,237	1.254	.893
1.10	..	111° 36′	92° 43′	106,051	114,954	139,698	1.210	.909
1.08	..	108° 36′	90° 34′	104,123	112,864	137,158	1.166	.926
1.06	..	105° 42′	88° 27′	102,195	110,774	134,618	1.124	.943
1.04	..	102° 53′	86° 21′	100,266	108,684	132,078	1.082	.962
1.02	..	100° 10′	84° 18′	98,338	106,593	129,538	1.040	.980
1.00	180° 0′	97° 31′	82° 17′	96,410	104,503	126,998	1.000	1.000
0.98	157° 2′	94° 56′	80° 17′	94,482	102,413	124,458	.960	1.020
0.96	147° 29′	92° 24′	78° 20′	92,554	100,323	121,918	.922	1.042
0.94	140° 6′	89° 56′	76° 24′	90,625	98,233	119,378	.884	1.064
0.92	133° 51′	87° 32′	74° 30′	88,697	96,143	116,838	.846	1.087
0.90	128° 19′	85° 10′	72° 36′	86,769	94,053	114,298	.810	1.111
0.88	123° 17′	82° 51′	70° 44′	84,841	91,963	111,758	.774	1.136
0.86	118° 38′	80° 34′	68° 54′	82,913	89,873	109,218	.740	1.163
0.84	114° 17′	78° 20′	67° 6′	80,984	87,783	106,678	.706	1.190
0.82	110° 10′	76° 8′	65° 18′	79,056	85,693	104,138	.672	1.220
0.80	106° 16′	73° 58′	63° 31′	77,128	83,603	101,598	.640	1.250
0.78	102° 31′	71° 49′	61° 45′	75,200	81,513	99,058	.608	1.282
0.76	98° 56′	69° 42′	60° 0′	73,272	79,423	96,518	.578	1.316
0.74	95° 28′	67° 37′	58° 16′	71,343	77,333	93,979	.548	1.351
0.72	92° 06′	65° 32′	56° 32′	69,415	75,242	91,439	.518	1.389
0.70	88° 51′	63° 31′	54° 50′	67,487	73,152	88,899	.490	1.429
0.68	85° 41′	61° 30′	53° 9′	65,559	71,062	86,359	.462	1.471
0.66	82° 36′	59° 30′	51° 28′	63,631	68,972	83,819	.436	1.515
0.64	79° 36′	57° 31′	49° 48′	61,702	66,882	81,279	.410	1.562
0.62	76° 38′	55° 34′	48° 9′	59,774	64,792	78,739	.384	1.613
0.60	73° 44′	53° 38′	46° 30′	57,846	62,702	76,199	.360	1.667
0.58	70° 54′	51° 42′	44° 51′	55,918	60,612	73,659	.336	1.724
0.56	68° 6′	49° 48′	43° 14′	53,990	58,522	71,119	.314	1.786
0.54	65° 22′	47° 54′	41° 37′	52,061	56,432	68,579	.292	1.852
0.52	62° 40′	46° 2′	40° 0′	50,133	54,342	66,039	.270	1.923
0.50	60° 0′	44° 10′	38° 24′	48.205	52,252	63,499	.250	2.000
0.45	53° 30′	39° 33′	34° 27′	43,385	47,026	57,149	.203	2.222
0.40	47° 9′	35° 0′	30° 31′	38,564	41,801	50,799	.160	2.500
0.35	40° 58′	30° 30′	26° 38′	33,744	36,576	44,449	.123	2.857
0.30	34° 56′	26° 4′	22° 46′	28,923	31,351	38,099	.090	3.333
0.25	28° 58′	21° 40′	18° 56′	24,103	26,126	31,749	.063	4.000
0.20	23° 4′	17° 18′	15° 7′	19,282	20,901	25,400	.040	5.000
0.15	17° 14′	12° 58′	11° 19′	14,462	15,676	19,050	.023	6.667
0.10	11° 29′	8° 38′	7° 34′	9,641	10,450	12,700	.010	10.000
0.05	5° 44′	4° 18′	3° 46′	4.821	5.252	6.350	.003	20.000

ACHROMATIC OBJECTIVES.

Our list of objectives embraces a variety from which a suitable selection may be made for every field of work. Our objectives are all carefully computed for the utmost

FREEDOM FROM COLOR,
LARGEST AMOUNT OF LIGHT,
GREATEST WORKING DISTANCE and
EXTREME FLATNESS OF FIELD,

for their respective apertures and magnifying powers. They are divided into two classes, according to the tube length for which they are corrected, and subdivided into series according to their apertures, for value of which see Aperture Table, page 73.

Short Tube (160.0 mm., 6⅔ inches) is intended to be used on the Continental Type Stands, and the objectives of Series I. are corrected for this tube length.

Long Tube (216.0 mm., 8½ inches) is adapted for the **American Type Stands.** Objectives of Series II., III., and IV. are corrected for the long tube.

While the short tube may be increased and the long tube reduced on any of our stands, it is highly important that the objectives, especially medium and high powers, be used with the **exact tube length** for which they are corrected and which is engraved on each.

All non-adjustable objectives are **corrected for a cover thickness** of **0.16 mm.** (0.064 in.), and the medium point of adjustment in all adjustable objectives is for the same thickness. This thickness is about the average of the No. 2 cover glass, but there is a wide difference between the two extremes. While a variation in thickness of the cover glass is admissible in the low powers, it disturbs the correction in medium powers and very considerably so in high powers, and, as a consequence, objectives fail proportionately to give good results. Cover glasses should therefore either be measured, for which purpose our Cover Glass Gauge is admirably adapted, and to which we call particular attention, or where means will permit, adjustable objectives should be selected. With these it is possible to obtain the highest degree of their performance under any condition, and where correct thickness is used, they may be left at the medium point of adjustment.

All objectives have the standard society screw are furnished in neatly finished brass boxes and have our name in full, "Bausch & Lomb Optical Co.," engraved upon them. We deem this necessary, as we often learn that unscrupulous parties palm off worthless productions as ours which are similar in appearance. The process of production is carried out on a system which was developed after constant efforts to reach the highest results, and **eliminates every possibility of chance,** so common to optical work generally. A faulty objective never leaves our hands, and every opportunity for improvement is utilized. The glass employed is the best obtainable, and only such is used, as, after a thorough test, has proven itself not liable to the least deterioration. The many thousands of our objectives which are in use, and the constantly increasing demand, fully attest their comparative merits as well as moderate prices.

SERIES I.--OBJECTIVES.

Corrected for tube length of **160.0** mm.

These objectives are specially designed for the Continental Microscopes. They are therefore not suited for use with our other instruments unless the length of tube is decreased to the proper point by means of the draw-tube. They are intended for biological work.

We believe that for

FLATNESS OF FIELD,
DEFINITION and
WORKING DISTANCE,

they are **not equalled** by any of similar type. **The 1 12 Oil Immersion** is worthy of **especial notice,** being of recent (1895) origin and superior capacity. It has been well received by the large number of prominent bacteriologists and biologists who have thoroughly tested its capabilities and have it in daily use. We, therefore, confidently invite comparison of this objective with the best of other manufacture. The lower powers of the series are notable for the excellent results obtained with biological subjects and for their superior illumination.

NO.	EQUIVALENT FOCUS.			APERTURE.	INITIAL MAGNIFICATION.	PRICE.
	Inches.	Millimeters.				
1000	3	75	Dry.	0.8	3.3	**$6.00**
1002	2	50	"	0.10	5	**6.00**
1004	1½	37	"	0.14	6.8	**6.00**
1006	1	25	"	0.18	10	**6.00**
1008	⅔	17	"	0.25	15	**6.00**
1010	½	12.5	"	0.36	20	**8.00**
1012	¼	6.3	"	0.77	40	**10.00**
1014	⅕	5.	"	0.82	50	**12.00**
1016	⅙	4.2	"	0.82	59	**12.00**
1018	⅛	3.2	"	0.85	78	**12.00**
1020	1/10	2.5	Oil Immersion.	1.25	100	**30.00**
1022	1/12	2.1		1.32	119	**38.00**
1024	1/16	1.6		1.32	156	**54.00**

Fitting Iris diaphragm to objectives for work in photo-micrography, - $6.00

SERIES II.--OBJECTIVES.

Corrected for tube length of **216.0** mm.

These objectives possess qualities which fit them excellently for the requirements of every-day work. They are unexcelled by many which are higher in cost and more pretentious. We use them in making up our outfits with the American Type Microscopes.

The lower powers of this series up to 1½ inch are composed of a single triplet system. They give good definition. The 1 inch, ¾ inch and ½ inch are two system, of excellent definition and very flat field. The remainder of the Series are three system. Unless it is expressly stated which objectives are desired we always send the ⅕ inch, of aperture 0.82, with our instruments as being best suited for general work. Where extreme long working distance is essential the ⅕ of aperture 0.62 is recommended.

The ⅕ inch has proven itself to be one of the best systems of the series.

The ⅛ inch is good for general histological work where higher power is desired.

No.	EQUIVALENT FOCUS.			APERTURE.	INITIAL MAGNIFICATION.	PRICE.
	Inches.	Millimeters.				
1040	3	75	Dry.	0.8	3.3	**$6.00**
1042	2	50	"	0.10	5.	**6.00**
1044	1½	37	"	0.14	6.8	**6.00**
1046	1	25	"	0.18	10	**6.00**
1048	¾	18	"	0.24	14	**7.00**
1050	½	12.5	"	0.36	20	**8.00**
1052	¼	6.3	"	0.62	40	**10.00**
1054	¼	6.3	"	0.77	40	**10.00**
1056	⅕	5	"	0.62	50	**12.00**
1058	⅕	5	"	0.82	50	**12.00**
1060	⅛	3.2	"	0.85	78	**12.00**

Fitting Iris diaphragm to objectives for work in photo-micrography, - - $6.00

SERIES III.--OBJECTIVES.

These objectives have a higher numerical aperture and a correspondingly better resolving and defining power than the preceding, and from the fact that they have larger lenses, give better illumination under the same conditions. They are substituted for those in the outfits for the difference in price.

The 3 to 5 inch is a variable objective. The variation is obtained by a revolving collar, and when at its highest power has a working distance of $\frac{1}{2}$ inch, and at its lowest power about 2 inches. The lower powers from 3 inch to $\frac{3}{4}$ inch are composed of two systems, each in itself achromatic and of such a combination as will give the best results. The $\frac{1}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{8}$ inch are objectives of excellent capacity, and possess comparatively great working distance.

The adjustable objectives are provided with a silvered collar, the graduation of which indicates the thickness of cover glass for which the systems are adjusted; thus, if the cover glass thickness is known, the objective may be quickly and accurately corrected by simply turning the collar to the figure indicated by the cover thickness.

The $^1/_{12}$ Oil Immersion is of **new construction,** giving **increased aperture** and resolving power. The working distance is ample for any cover thickness. A bottle of cedar oil accompanies each objective. The water immersion objectives are notable for their long working distance and clearness of definition.

The lower powers are especially well **adapted** for **Photography,** and will be corrected for this purpose when desired.

No.	EQUIVALENT FOCUS.				APERTURE.	INITIAL MAGNIFICATION.	PRICE.
	Inches.	Mm.					
1100	3–5		Variable.	Adjustable.			**$18.00**
1102	3	75	Dry.	Non "	0.10	3.3	**13.00**
1104	2	50	"	" "	0.14	5.	**13.00**
1106	$1\frac{1}{2}$	37	"	" "	0.20	6.8	**15.00**
1108	1	25	"	" "	0.31	10	**15.00**
1110	$\frac{3}{4}$	18	"	" "	0.35	14	**15.00**
1112	$\frac{1}{2}$	12.5	"	" "	0.54	20	**18.00**
1114	$\frac{1}{4}$	6.3	"	Adjustable.	0.88	40	**24.00**
1116	$\frac{1}{5}$	5.	"	"	0.90	50	**28.00**
1118	$\frac{1}{8}$	3.2	"	"	0.92	78	**30.00**
1120	$\frac{1}{8}$	3.2	Water Im.	"	0.99	78	**25.00**
1122	$\frac{1}{10}$	2.5	"	"	0.99	100	**28.00**
1124	$\frac{1}{12}$	2.1	"	"	0.99	118	**30.00**
1126	$\frac{1}{16}$	1.6	"	"	0.99	156	**35.00**
1128	$\frac{1}{10}$	2.5	Oil Im.	Non "	1.25	100	**30.00**
1130	$\frac{1}{12}$	2.1	"	" "	1.32	118	**44.00**
1132	$\frac{1}{16}$	1.6	"	" "	1.32	156	**60.00**

Nos. 1130 and 1132 in adjustable mounting, $10.00 extra.

Fitting Iris diaphragm to objectives for work in photo-micrography, - - $6.00

SERIES III A—PROJECTION OBJECTIVES.

These objectives are especially corrected for flatness and definition, and, having extremely large lenses, produce well illuminated and sharply defined images over the entire field. When informed of the distance between the lantern and screen, the lenses will be especially corrected for that distance. These objectives are provided with a sliding hood by means of which a sharply defined circle is obtained on the screen.

No.	EQUIVALENT FOCUS.		INITIAL MAGNIFICATION.	PRICE.
	Inches.	Mm.		
1140	3	75	3.3	**$13.00**
1141	2	50	5.0	**13.00**
1142	$1\frac{1}{2}$	37	6.8	**15.00**
1143	1	25	10	**15.00**
1144	$\frac{3}{4}$	18	14	**15.00**
1145	$\frac{1}{2}$	12.5	20	**12.00**
1146	$\frac{1}{4}$, Two System,	6.3	40	**12.00**

SERIES IV.--OBJECTIVES.

These objectives stand next to the Apochromatics in resolving power and freedom from aberration. The $\frac{1}{6}$ inch stands pre-eminent as a dry objective, and is particularly valuable on account of its freedom from the inconvenience of immersion fluids. Its adjustment is by rectilinear movement of the posterior system.

The oil immersion objectives are four system, and possess in a very high degree those qualities necessary in objectives of this class — extreme aperture with long working distance, resolution and flatness of field. Their aperture is not less than 1.40, and the resolving power is commensurate with it.

After considering the fact that variation in immersion fluid and length of tube, change of eyepieces, cover-glasses of different refraction, in a word, circumstances differing from those under which the objective was corrected, affect its utility; and believing that a high grade objective should work equally well under any of these conditions, we have decided to make the above series in adjustable mountings only.

NO.	EQUIVALENT FOCUS.			APERTURE.	INITIAL MAGNIFICATION.	PRICE.
	Inches.	Millimeters.				
1150	$\frac{1}{6}$	4.2	Dry.	0.94	59	**$40.00**
1154	$\frac{1}{10}$	2.5	Oil Immersion.	1.40	100	**80.00**
1156	$\frac{1}{12}$	2.1		1.40	119	**90.00**
1158	$\frac{1}{16}$	1.6		1.40	156	**125.00**

SERIES IV A—ILLUMINATING OBJECTIVES.

These objectives are intended for reading fine graduations on metallic surfaces only. They are fitted with prism admitting light through the side of the objective in such a manner as to illuminate the object observed.

After a long experience in the manufacture of these objectives which has developed features not common to the ordinary problems, we are now able to supply them so arranged as to give an equally illuminated field and high degree of definition. It is necessary, however, that we be informed of the angle of the source of light.

NO.	FOCUS.	PRICE.
1160	$1\frac{1}{2}$ inch.	**$22.00**
1161	1 "	**22.00**
1162	$\frac{3}{4}$ "	**22.00**
1163	$\frac{1}{2}$ "	**18.00**

LINEAR MAGNIFYING POWERS

—OF—

OBJECTIVES AND EYEPIECES.

MANUFACTURED BY

BAUSCH & LOMB OPTICAL CO. {ROCHESTER, N. Y. NEW YORK CITY.

IMAGE DISTANCE 250.0 MM.

Objective.		EYE PIECES. TUBE LENGTH 216.0 MM.					EYE PIECES. TUBE LENGTH 160.0 MM.					Objective.	
		2 In.	1 1/2 In.	1 In.	3/4 In.	1/2 In.	2 In.	1/2 In.	1 In.	3/4 In.	1/2 In.		
		50 mm.	40 mm.	25 mm.	18 mm.	12 mm.	50 mm.	40 mm.	25 mm.	18 mm.	12 mm.		
Inch.	mm.											Inch.	mm.
3	75.0	15	22	28	37	48	11	16	21	28	35	3	75.0
2	50.0	20	28	38	49	60	16	22	30	40	54	2	50.0
1 1/2	37.0	27	39	53	66	84	23	33	44	56	70	1 1/2	37.0
1	25.0	38	55	72	95	122	30	41	53	69	85	1	25.0
3/4	18.0	56	78	110	145	180	55	74	96	130	165	2/3	17.0
1/2	12.5	88	132	180	230	282	88	120	155	200	265	1/2	12.5
1/4	6.3	185	275	360	485	620	190	260	355	455	560	1/4	6.3
1/5	5.0	240	345	460	605	770	230	315	410	550	710	1/5	5.0
1/6	4.2	280	405	540	735	900	265	340	450	585	750	1/6	4.2
1/8	3.2	425	600	780	970	1200	345	460	590	770	980	1/8	3.2
1/10	2.5	510	700	935	1200	1480	580	810	1060	1400	1760	1/12	2.1
1/12	2.1	750	1125	1450	1950	2500	820	1100	1420	1860	2350	1/16	1.6
1/16	1.6	1000	1400	1850	2375	2950							

EYEPIECES.

The following eyepieces are adapted for use with the Achromatic Objectives of Series I., II., III., IIIA, IV., and IVA, and are designated as

HUYGHENIAN, CONTINENTAL and SOLID.

The two former being of the Huyghenian construction, the first being intended for the American and the second for the Continental type microscopes.

Both have been **recently recomputed,** making the focal plane correspond with the upper end of the tube, the **image remaining** in **focus** regardless of the change of eyepiece. The optical tube length, therefore, remains constant, an important feature in estimating the magnifying power of the combinations.

The field is **large** and **very flat,** giving excellent definition, extreme care being employed in making every part.

Eyepieces for the American Type Microscope have a reduced neck fitted with a removable cap, protecting the eye while working, and allowing the eye lens to be easily cleaned.

The Continental Eyepiece consisting of a straight tube with the eye lens in a suitable mounting, which prevents disturbing reflections, are to be used only with Continental Microscopes as they are corrected for 160.0 mm. tube length.

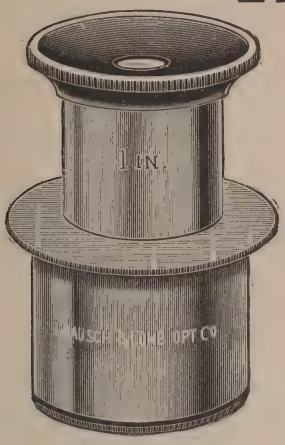
The Solid Eyepiece consists of a solid lens having the proper curvatures. A circular groove is cut in the glass at the proper distance between the two surfaces and is filled with an opaque pigment which forms the diaphragm. These eyepieces are only made in the high powers and are to be recommended when high eyepiecing is desired, as they give a better illuminated field than the high powers of the Huyghenian type. We continue to use the par focal system and nomenclature, designating them according to the equivalent foci of the lenses, each eyepiece being engraved accordingly.

DIRECTIONS FOR ORDERING EYEPIECES.

When orders for eyepieces are given by measurement for other instruments than our own, we follow them exactly; but our experience has shown that this method is unreliable from the fact that the ordinary means of measuring are not sufficiently accurate. We would suggest that the best method of informing us of the size desired is to send us a strip of good paper of such a length that when wound around the eyepiece the two ends will just meet.

We make an extra charge for fitting our eyepieces to microscopes of other manufacture.

EYEPIECES.



HUYGHENIAN.

CONTINENTAL.

HUYGHENIAN EYEPIECES.

CAT. NO.	EQUIVALENT FOCUS.		MAGNIFICATION. DIAMETERS.	PRICE.
	Inches.	Mm.		
1200	2	50.0	5	**$4.00**
1202	1½	37.0	7	**4.00**
1204	1	25.0	10	**4.00**
1206	¾	18.0	14	**4.00**
1208	½	12.5	20	**4.00**

CONTINENTAL EYEPIECES.

CAT. NO.	EQUIVALENT FOCUS.		MAGNIFICATION. DIAMETERS.	PRICE.
	Inches.	Mm.		
1220	2	50	5	**$2.00**
1222	1½	37	7	**2.00**
1224	1	25	10	**2.00**
1226	¾	18	14	**2.00**
1228	½	12.5	20	**2.00**

SOLID EYEPIECES.

CAT. NO.	EQUIVALENT FOCUS.		MAGNIFICATION. DIAMETERS.	PRICE.
	Inches.	Mm.		
1260	½	12.5	20	**$6.00**
1262	⅓	8.5	29	**6.00**
1264	¼	6.3	40	**6.00**
1266	1/6	4.2	59	**6.00**
1268	⅛	3.2	78	**6.00**

For Micrometer Oculars, see Micrometers.

APOCHROMATIC OBJECTIVES.

Computed by Prof. Chas. S. Hastings, Sheffield Scientific School, Yale University.

These Apochromatic Objectives contain **No Fluorite** and are made throughout of absolutely permanent materials.

The significance and utility of the Apochromatic construction can be best understood by reviewing, even if very briefly, the development of the microscope.

Dolland's brilliant invention of the method of achromatic correction remained infertile until Selligue, in 1824, constructed objectives of a number of binary lenses combined into a single system.

In 1830 Lister pointed out that the separation of the parts of an objective might have a very important effect upon its performance, and that the efficacy of an objective increases with the angular extent of the transmitted pencils. He proposed the name "angular aperture" for this constant.

It was later demonstrated that the sine of half of Lister's constant multiplied by the index of refraction of the immersion fluid (air, water, oil, etc.) was the true measure of efficacy, to which Professor Abbe has given the name "numerical aperture," although there is now every reason for omitting the first word.

Between 1850 and 1860 the use of a single front lens, hemispherical in the higher powers, became general, and constituted an improvement greater than any other which had followed Selligue's.

As soon as the value of the constructions noted became generally understood their capabilities were quickly exhausted and further improvement demanded a new principle. This was found in Amici's invention of the immersion system. Here also the improvement was eagerly adopted, and we may regard its capacity as having been fully tested and determined during, roughly speaking, the eighth decade of the present century.

During the period thus hastily reviewed a vast number of experiments were made, all showing that it was impossible to make a good microscope with a low power objective, even of great aperture and a high power ocular, and also the apparently contradictory fact that there was no gain in very high powers, whether secured by powerful objectives or otherwise.

The cause of the failure of high powers has been shown by Professors Helmholtz and Abbe to be due to the nature of light which fixes an absolute limit to microscopic vision. We cannot hope to resolve lines closer together than the length of one-half a wave of light.

The true source of gain in the immersion principle lies in the fact that in the denser medium the wave lengths are absolutely shorter.

The source of difficulty in the employment of low power objectives of large aperture lies in the fact that the spherical aberration diminishes continuously from the long light waves to the short, so that if the system is properly corrected for yellow light it is under corrected for the orange and red and over corrected for the green, blue and violet. This chromatic difference of spherical aberration renders the image so imperfect that it will not bear high magnification by the ocular.

Prof. Abbe has indicated a method by which this troublesome defect, a defect which rapidly increases in importance with increasing apertures, may be corrected, and has founded upon it the improved construction which he has styled the Apochromatic Objective. He showed that it is dependent upon the separation of the parts of the optical elements which together constitute the objective.

The problem of applying this principle is a difficult one, for the highest powers perhaps the most difficult of any in practical optics.

Professor Abbe's solution has not been published.

The solutions made by Professor Hastings are quite independent and have nothing in common with those of Professor Abbe except the higher order of correction.

The separation of the elements introduces a new error in the image formed by the improved objectives, namely, a chromatic difference of magnification.

This difference appears to the eye as a color defect, which, insensible at the center of the field, increases continuously in approaching the margin.

The error is eliminated by the use of specially devised oculars, having a chromatic error opposite to that of the objectives and which are called Compensating Oculars.

Since apertures less than 0.30 may be satisfactorily produced by the older method and those greater than 1.40 are practically unattainable, we confine our list of Apochromatic Objectives to these limits.

On account of the great convenience and cleanliness of water as an immersion fluid, we list one objective of this type.

Since the oil immersion of 1.30 aperture is only seven per cent. less effective than that of 1.40 aperture, and the greater certainty of accurate construction and consequent saving of cost is considerable, this type is also included.

Of the Compensating Oculars it may be said that all of the powers listed are applicable to the entire series of objectives, the rear lenses of all the members being of like diameters.

Number 2 is useful chiefly as a finder and in photomicrography.

Numbers 4 and 8 are most generally useful in ordinary work.

Number 12 is desirable when the utmost power of the objective is to be called upon, while the number 16 is very useful as an aid in securing the finest adjustment in the objectives for a given object.

The magnification can be found in every case by dividing 250 mm., the conventional distance for distinct vision, by the focal length of the objective and multiplying the quotient by the number of the ocular; thus, the lowest power of the series is equal to

$$(250 \text{ mm.} \div 16) \times 2 = 31,$$

and the highest to

$$(250 \text{ mm.} \div 3.5) \times 16 = 1136).$$

The corrections are all made for a tube length of 160 mm.

Higher and lower powers than those given, both of objectives and oculars, can be supplied, but it is believed that they will meet all rational requirements in the most satisfactory manner.

The Apochromatic objectives herewith listed differ from all others in that they **contain no fluorite** and are constructed of absolutely permanent materials.

They give images free from spherical and chromatic aberration, rendering even the most highly refractive objects in their natural colors. Their great aperture, in connection with the superior color correction, gives the greatest resolving and defining power.

They are **superior for photographic purposes.** Having no focus difference, the image is reproduced on the sensitive plate exactly as seen on the focusing screen without extra adjustment of the camera back or the interposition of ray filters, etc.

SERIES V.--APOCHROMATIC OBJECTIVES.

CATALOGUE NO.	FOCI. Mm.	FOCI. In.	APERTURE.	INITIAL MAGNIFYING POWER.	TYPE.	PRICE.
1170	16.0 mm.		0.30	15.5	Dry.	**$ 32.00**
***1172**	16.0 mm.	$\frac{2}{3}$	0.30	15.5		**32.00**
1175	8.0 mm.		0.60	31	"	**40.00**
***1178**	8.0 mm.	$\frac{1}{3}$	0.60	31		**40.00**
1180	5.0 mm.		0.95	50	"	**48.00**
***1182**	5.0 mm.	$\frac{1}{6}$	0.95	50		**48.00**
1185	4.0 mm.		1.25	62	Water Imm.	**56.00**
***1188**	4.0 mm.	$\frac{1}{6}$	1.25	62		**56.00**
1190	3.8 mm.		1.30	66	Oil "	**110.00**
***1192**	3.8 mm.	$\frac{1}{7}$	1.30	66		**110.00**
1195	3.5 mm.		1.40	70	" "	**150.00**
***1198**	3.5 mm.	$\frac{1}{8}$	1.40	70		**150.00**
1200	2.0 mm.	$\frac{1}{12}$	1.30	125	" "	**120.00**
***1202**	2.0 mm.	$\frac{1}{12}$	1.30	125	" "	**120.00**
1205	2.0 mm.	$\frac{1}{12}$	1.40	125	" "	**160.00**
***1208**	2.0 mm.	$\frac{1}{12}$	1.40	125	" "	**160.00**

***These Objectives are corrected for the long standard of tube length only.**

COMPENSATING OCULARS.

	USE.	SERIES NUMBER.	FOCI. mm.	FOCI. Inches	
1270	Finder Ocular and	2	100.0 mm.	4	**$ 8.00**
***1272**	Photography,	2	131.0 mm.	5	**12.00**
1275	General Work,	4	50.0 mm.	2	**8.00**
***1278**	" "	4	66.0 mm.	$2\frac{1}{2}$	**12.00**
1280	" "	8	25.0 mm.	1	**12.00**
***1282**	" "	8	37.0 mm.	$1\frac{1}{2}$	**16.00**
1285	Highest Resolving Power.	12	17.0 mm.	$\frac{3}{4}$	**12.00**
***1288**	" " "	12	22.0 mm.	1	**16.00**
1290	Focusing Ocular,	16	12.0 mm.	$\frac{1}{2}$	**10.00**
***1292**	" "	16	19.0 mm.	$\frac{5}{4}$	**14.00**

***Corrected for the long standard of tube length only.**

MISCELLANEOUS APPARATUS.

Since the issue of the last edition of our catalogue, many **new** and **important accessories** have been **constructed** and many of the old ones have been remodeled **and improved.**

The following **list** of **apparatus** is very **complete,** and a selection suitable to every field of microscopical investigation may be made therefrom. Many of the instruments are **original** with us and are **listed only** in this catalogue, while the value of many others is **enhanced** by features **not found** in apparatus usually listed for similar purposes.

It is but natural that with **additional experience, improved facilities** and an **earnest desire** to **improve** every advantage arising from these factors, that the **excellence** of **workmanship** and **practical** utility of construction should improve.

With due regard to the productions of other makers, we believe that most of the articles are **not equalled** in the above mentioned qualities.

Among other additions to the list, we would mention our Improved **Abbe Camera Lucida,** and **Drawing Board** for use with it, the convenient and economical **BB Substage,** the New Improved **Complete Substage, Ray Filter** for monochromatic light, Improved **Nosepieces,** Triple **Lens Arm** and Triple **Revolving Lens Carrier** for the Dissecting Microscopes, New **Glass Stages** with Slide Carrier, New **Attachable Mechanical Stage** and **Revolving Mechanical Stage,** Improved **Filar Micrometer, Micrometer Ocular, Rafter** Counting **Apparatus,** Improved **Centrifuge** with **Hæmatokrit, Urine** and **Sputum Attachment, Drawing** and **Modelling** instruments, **Spectrometer, Sphærometer, Saccharometer, Demonstration,** and other **Lenses,** etc., all of which are illustrated and described in their respective paragraphs.

Apparatus not listed can be obtained at satisfactory rates, and we are in position to furnish estimates on short notice.

ILLUMINATING APPARATUS AND APPLIANCES.

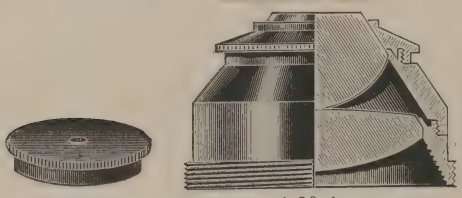
Abbe Condensers. The lenses comprising these condensers are of short focus and of such a size that they will utilize almost all the rays that will pass through the substage ring. The condenser systems are made in two forms,

a) a double combination of 1.20 aperture,

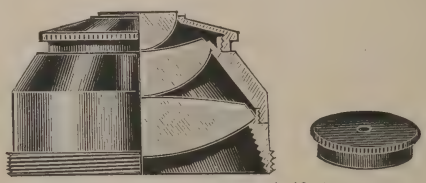
b) a triple combination of 1.42 aperture,

the former suited for objectives of medium aperture, the latter will do justice to objectives of the largest aperture. The volume of light is sufficient with the highest amplification. The full aperture of the illuminating cone should be used only when deeply stained preparations are being examined with objectives of large aperture. In every other case the cone must be reduced, preferably by an iris diaphragm. These condensers will work both dry and immersion. The pin hole cap provides means of knowing exactly when the condenser is centered.

These condensers can be fitted to mounting No. 1475. They are reversible and adjustable in the adapters and can be used on any stand having standard size of substage.



Optical part of condenser 1.20 Aperture.



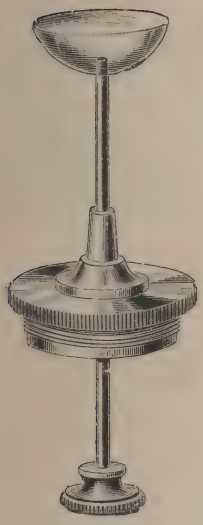
Optical part of Condenser 1.42 Aperture.

No.		Price.
1400.	**Abbe Substage Condenser** 1.20 Aperture, in plain substage adapter, without means for regulating light, with pin hole cap, in morocco case,	**$ 6.00**
1405.	**Abbe Substage Condenser** 1.42 Aperture, same as above, in morocco case,	**7.00**
1410.	**Abbe Achromatic Substage Condenser** 1.0 Aperture, with pin hole cap, in morocco case,	**20.00**
	This condenser is specially adapted for the requirements of photo micrography, viz: for projecting a sharp image of the source of light in the plane of the object. It is recommended to be used with iris diaphragm mounting No. 1475, and when so fitted the mounting is placed between the systems of the condenser.	
1415.	**Hemispherical Illuminator,** an excellent accessory in the resolution of different tests,	**1.50**
1420.	**Hemispherical Illuminator,** as above, with substage adapter,	**5.00**
1425.	**Vertical Illuminator** with rotating diaphragm, in neat brass box,	**4.50**
1430.	**Woodward Prism,** for extreme oblique illumination,	**1.25**
1435.	**Woodward Prism,** mounted with substage fitting,	**5.50**

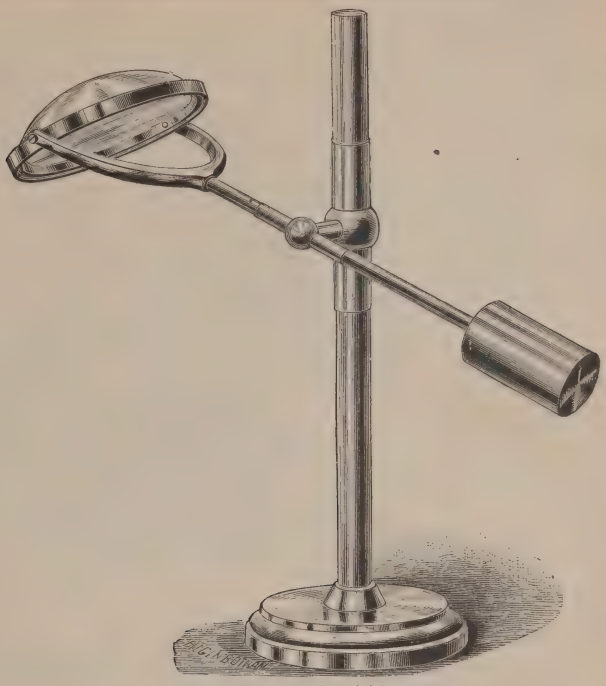
Paraboloids. These Paraboloids are used for dark ground illumination. The lower surface is plane and the top has a concave polished parabolic surface. An opaque stop prevents the light passing through the central portion.

The object is illuminated on all sides by oblique light and is exhibited in relief on a dark back ground. Beautiful results are obtained with low powers when the Paraboloid is employed to illuminate large objects, such as whole insects.

No.		Price.
1440.	**Paraboloid** with opaque stop cemented to concave surface, mounted in standard size substage adapter with flange,	**$ 7.00**
1445.	**Paraboloid** with adjustable opaque stop, mounted in standard size substage adapter with flange,	**12.00**



No. **1420.**
HEMISPHERICAL ILLUMINATOR.

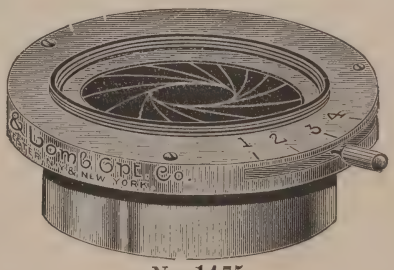


No. **1460.**
BULLS EYE CONDENSER.

No.		Price.
1450.	**Bulls Eye Condenser,** diameter of lens 1½ inches,	**$ 4.00**
1455.	**Bulls Eye Condenser,** diameter of lens 2¼ inches,	**7.00**
1460.	**Bulls Eye Condenser,** diameter of lens 3 inches,	**10.00**

These condensers are mounted in brass, lacquered, have heavy base, with upright pillar to which a sleeve is fitted, carrying rod with fork and condenser at one end and a counter-balancing weight at the other. They are adjustable for height and in every other direction.

No. **1465.**
DOME DIAPHRAGM.



No. **1475.**
CONDENSER MOUNTING, WITH IRIS DIAPHRAGM.
(Cut does not show stops or blue glass.)

1465. **Dome Diaphragm,** can be used on any substage of the American Type Microscopes, **$2.00**

State when ordering whether it is to be inserted in the substage from above or below.

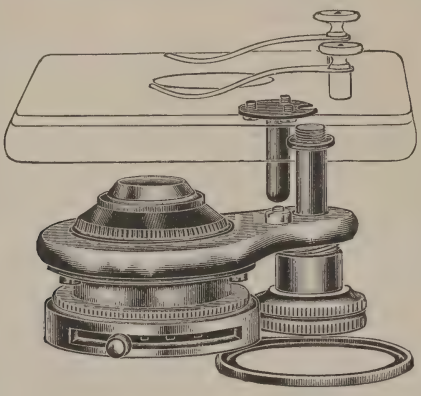
1470. **Cylinder Diaphragm,** of three different apertures, **2.00**

This consists of a substage adapter, to the upper end of which the metal caps of different apertures are fitted. In ordering, please state with which of our instruments it is intended to be used, or if for instrument other than our make, give exact dimensions of the substage ring.

No. Price.

1475. **Condenser Mounting,** with **Iris Diaphragm,** and set of two stops for dark ground illumination and blue glass for use with lamp light, - - - **$6.00**

This mounting offers a ready means for controlling the volume of light, and is well suited to the ordinary needs of the physician and student. The diaphragm opening may be decreased from 27mm. to 1mm. by means of a lever. The mounting is reversible and can be attached to any substage, and may be used with Nos. 1400, 1405 and 1410.



No. **1485.**

BB—SUBSTAGE.

The figure shows the manner of applying the substage to the stage of the microscope.

1480. **BB Substage,** with cylinder diaphragm and three caps with different sized openings, - - - - - - - - - - - **6.00**

1485. **BB Substage,** complete, with Abbe Condenser 1.20 Aperture., Iris Diaphragm, Blue Glass and Stops for dark ground illumination, - - - - **18.00**

This substage consists of a metal ring (for holding the diaphragm, condenser or polarizer) carried on a circular supporting plate, to which it is attached by three screws passing through slots, thus making it easy to center the ring for any apparatus used in it.

The **substage has** very **delicate** and **accurate** vertical **adjustment** by means of a heavy, six strand, **quick acting screw,** the apparatus being maintained in the optic axis by a steel post which passes through an opening in the arm of the supporting plate, which also has a short post locking into a depression in the stage. Right hand motion of the milled head brings the substage into the optic axis and elevates it to the stage. Left hand motion depresses it and throws it out of the axis.

The BB Substage is **applicable to any of our microscopes** except the G or D stands.

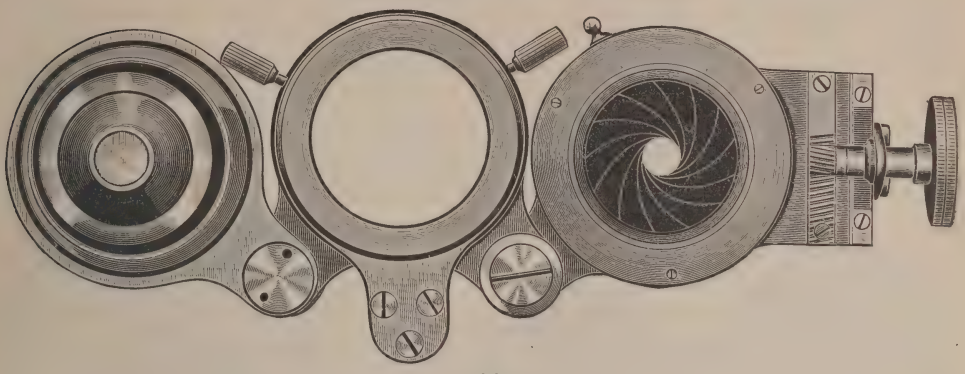
1490. **Ray Filter** for Monochromatic light, applicable to either substage No. 1480 or No. 1495, - - - - - - - - - - **3.50**

This Ray Filter consists of a glass cell formed by cementing between two perfectly plane pieces of optical glass, a glass ring.

Two holes are drilled in the glass ring through which the fluid used to absorb the undesirable rays, is introduced. The cell is filled with a fluid, containing in solution the proper substance to absorb all but the rays which it is desired to use.

With this Filter monochromatic light of any wave length may be obtained **over the entire field** of the condenser, by simply using different absorbing fluids in the cell. We furnish the filter charged with a solution of Bichromate of Potash or of Copper Sulphate and Ammonia as desired. A pair of forceps for removing the plugs used to close the openings in the cell, and pipette for filling or emptying it, accompany each Filter.

COMPLETE SUBSTAGE ATTACHMENT.

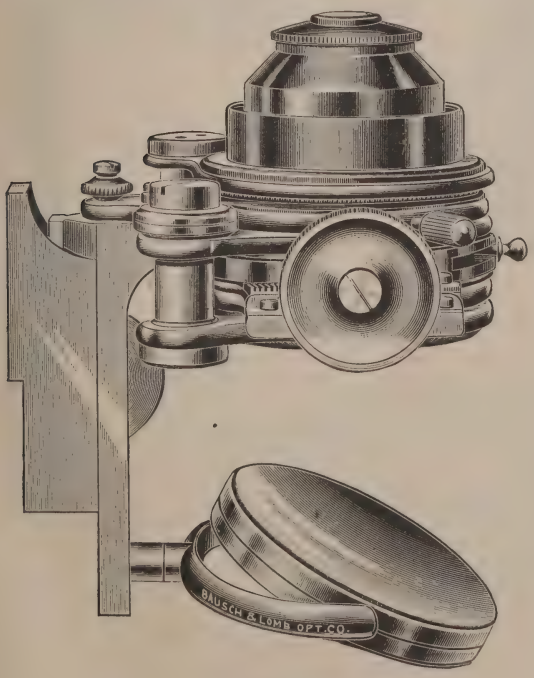


No. **1497.**

COMPLETE SUBSTAGE ATTACHMENT.

Top view of Complete Substage Attachment, showing centering ring with milled heads—Iris Diaphragm swung to the right and Condenser to the left.

No.		Price.
1495.	Complete Substage Attachment, with Mirror (without condenser) set of two Stops for dark ground illumination and Blue Glass for use with lamp light, - -	**$18.00**
1496.	Complete Substage Attachment, with Mirror, Abbe Condenser, 1.20 Aperture, set of two Stops for dark ground illumination and Blue Glass for use with lamp light, - - - - - - - - - -	**24.00**
1497.	1496, with Abbe Condenser 1.42 Aperture, in place of 1.20 Aperture, - -	**25.00**



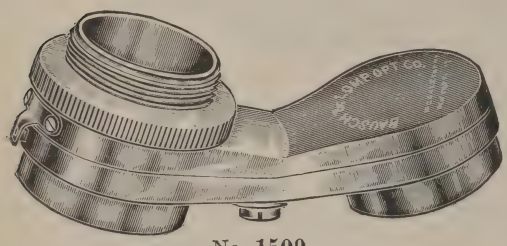
No. **1497.**

Showing the parts in position as used on the microscope for central illumination.

This substage attachment can be used on any of our microscopes except the simple forms. The edges are all rounded, making them agreeable to the touch. The entire substage has vertical motion by means of diagonal rack and pinion in a slide, which has been made stronger than in the older forms, giving greater delicacy and lasting qualities. The arrangement is such that the condenser may be **swung out of the optical axis** to the left independently of the other parts, and the **iris diaphragm** can be **swung** to the **right** in the same manner. Notwithstanding the addition of the **extra arm** for the condenser, the **weight** and **rigidity** of the old construction have been maintained. The substage ring and iris diaphragm have a **centering apparatus** operated by two milled heads by means of which their axes may be made to correspond with that of the objective, a feature **of great importance,** in using **high powers.** The Iris Diaphragm is mounted so that it can be revolved upon its own axis and has lateral motion by means of diagonal rack and pinion for oblique illumination. The upper surface of the mounting has a recess to receive blue glass or dark stops. The Ray Filter described on page 88 can also be used with this substage. Mirrors are plane and concave and of large size.

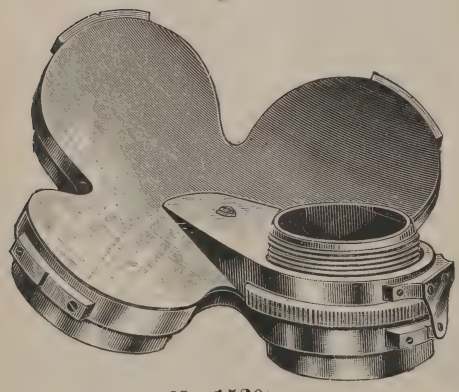
REVOLVING NOSEPIECES.

The Revolving Nosepieces herewith listed are recommended for use with **every microscope** where more than one objective is employed. They are constructed after new and improved methods and are extremely accurate and not liable to get out of center. When the nosepiece is ordered with the microscope the objectives are centered to it gratis. All the objectives of Series I. and II. of one inch focus, or less, will be mounted so that when attached to the nosepiece they will focus in the same plane if ordered with a nosepiece, otherwise they will require slight adjustment to bring them successively in focus.

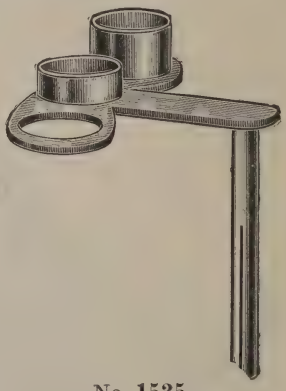


No. **1500.**
DOUBLE NOSEPIECE.
NICKELED.

No. **1550.**
TRIPLE NOSEPIECE.
NICKELED.



No. **1520.**
QUADRUPLE NOSEPIECE.
NICKELED.



No. **1535.**
TRIPLE LENS ARM.

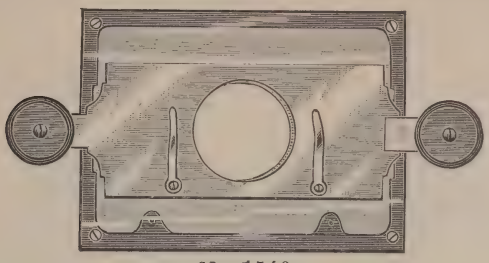
No.		Price.
1500.	**Nosepiece, double,** nickel plated,	**$5.00**
1505.	**Nosepiece, double,** aluminum,	**6.75**
1515.	**Nosepiece, triple,** nickel plated,	**7.50**
1515.	**Nosepiece, triple,** aluminum,	**10.00**
1520.	**Nosepiece, quadruple,** nickel plated,	**12.00**
1525.	**Nosepiece, quadruple,** aluminum,	**15.00**
1535.	**Triple Arm** for carrying three simple lenses,	**2.50**

This arm is applicable to any of our simple dissecting microscopes between the numbers T and W. The three adapters are of suitable size to receive any of the lenses except 10 and 40, and will be made of such depth as to bring the focal point of the lenses ordered for use with it in the same plane.

1540. **Triple Revolving Lens Carrier** for three lenses, **5.00**

This lens arm is designed to carry the three lens most needed in dissecting work, viz.: the two inch double achromatic lens of two inch focus and the Hastings Aplanatic Triplets of $\frac{3}{4}$ inch and $1\frac{1}{2}$ inch focus respectively, being so constructed that all of these lenses will focus in the same plane. The carrier revolves about an axis at the end of an arm, which is jointed, permitting the entire stage of the microscope to be covered. A spring stop holds the lens in proper position during use. This Lens Carrier is applicable to the Y dissecting microscope.

ATTACHABLE STAGES.

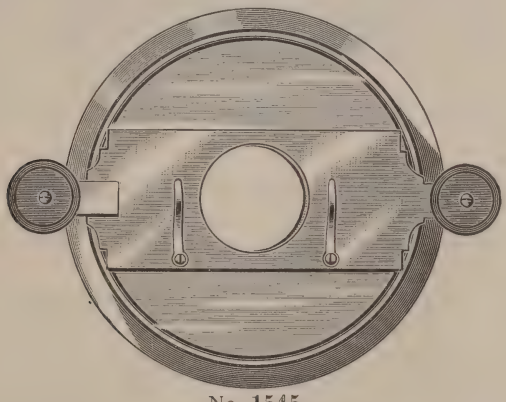


No. **1540.**

SQUARE GLASS STAGE WITH SLIDE CARRIER.

No.		Price.
1540.	**Glass Stage,** square, with slide carrier, - - - - - - -	**$5.00**

This stage is instantly attachable to the B, BB and BBS microscopes by means of two pins which slip into the holes in the stage in place of the spring clips. The slide is carried on a metal plate touching the upper surface of the stage at four points and held firmly by two spring arms, the points of which bear on the lower surface of the glass plate. The slide is held in place by spring clips. The slide carrier has two hard rubber finger pieces at the sides by which it is held during manipulation. The motion obtainable is **very delicate** and **regular** and very convenient for rapid searching.

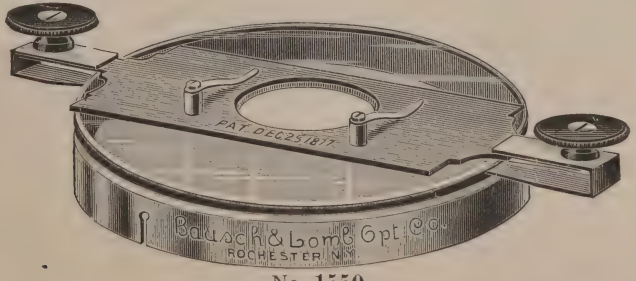


No **1545.**

CIRCULAR GLASS STAGE WITH SLIDE CARRIER.

1545.	**Glass Stage,** circular, with slide carrier, - - - - - -	**5.00**

This stage is similar in construction to No. 1540, except that it is attached by the metal edge which slips over the edge of the microscope stage, but is designed for the Continental microscopes BBC, BBCS and CCS, which have circular stages.

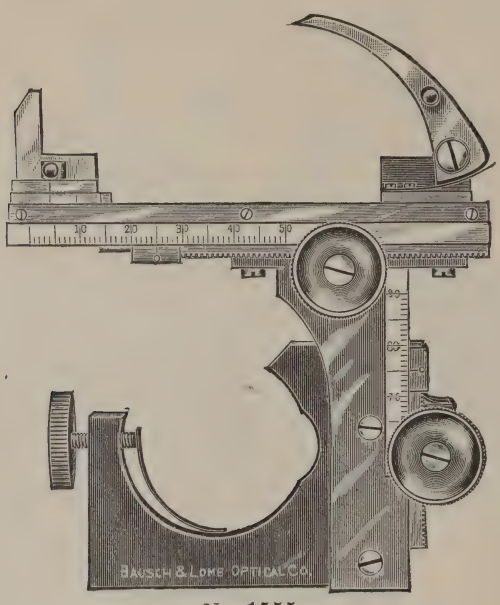


No. **1550.**

CIRCULAR GLASS STAGE WITH SLIDE CARRIER.

1550.	**Glass Stage,** circular, with slide carrier, - - - - - -	**5.00**

This stage is similar in construction to No. 1545, but is applicable only to the F, H, J and JS American type microscopes.



No. **1555.**

ATTACHABLE MECHANICAL STAGE.

No. Price.

1555. Attachable Mechanical Stage, - - - - - - - **$25.00**

As this Stage is **instantly attachable** to **or removable** from the microscope, and as it combines all the essentials for search work and counting, with a very moderate cost, we believe it will meet the wants of bacteriologists and others who make **rapid** and thorough **examinations.**

The Stage is attachable to any microscope of the Continental type by means of a curved piece with a binding screw which is so shaped as to clasp the base of the arm of the microscope and hold the stage firmly in position.

When ordered with a microscope it will be adjusted so that it may be removed and replaced again without disturbing observations recorded with the Maltwood finder. In attaching the stage to the microscope, place a postal or other card of about the same thickness on the microscope stage, then bind the mechanical stage in position with the screw. Afterward remove the card.

Both **rectangular movements are by** diagonal **rack and pinion.** The pinions stand with their axes vertical and parallel, and with the milled heads close enough together to make the **manipulation** of the stage very **convenient** and giving **great accuracy** and **delicacy** of **movement** with the additional advantage of **equal speed** with **both pinions.**

The stage has lateral motion of 50 mm. and motion at right angles to this of 30 mm., the amount of motion being read by silvered millimeter scales with index.

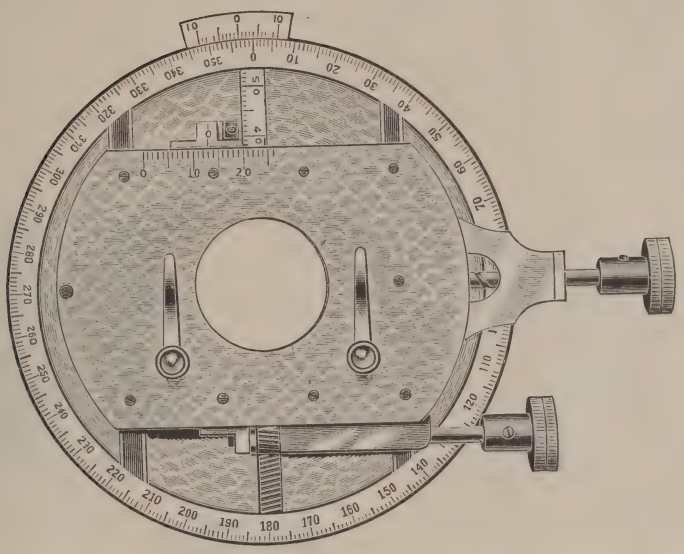
The slide is held on the stage by a spring finger which presses it against a rectangular **stop** which is **adjustable** for various sizes of slides. A scale indicates the position of the stop for any observation.

N. B.—When ordering stage only, give distance from top surface of microscope stage to the upper surface of the plate on which it rests.

1560. Mechanical Stage—Revolving, - - - - - - - **32.00**

This stage is similar in every respect to No. 1570, except that it is smaller and the circumference is without graduations.

It is applicable to the BBC, BBCS, F, H, J, and JS microscopes.



No. Price.

1570. Mechanical Stage, revolving with graduated circumference, - - - **$40.00**

This stage is revolvable about the optical axis and has two movements in the plane of the stage and at right angles to each other. The circumference of the stage is graduated to degrees and has a vernier which reads to 6′. The forward and backward movement of the object-carrier is by rack and pinion; the lateral movement by quick acting screw. The milled heads for the fingers are placed close together on the right side of the stage and are of sufficient size to secure very delicate control of the movements. Millimeter scales, reading from 0 to 26 and from 27 to 52, are provided for recording the amount of movement in either direction, and which serve to record the position of the object-carrier. Clips and a stop are provided on the object plate by which objects once recorded can be re-found. The rectangular motions have a range of 26 mm. in each direction.

In this stage **all movements** and fittings are made with the **utmost care** and may be relied upon for the **most delicate** micrometric work.

This stage is applicable to our CCS and K microscopes.

MEASURING & COUNTING APPARATUS.

Eyepiece and Stage Micrometers.

As the eyepiece micrometer is not compared with the object itself, but only with the image of it formed in the focus of the eyepiece, it is only when the exact proportion between the size of the object and that of its image is known, that measurements of the object can be readily determined by the eyepiece micrometer.

This proportion depends upon: 1st, the focus of the objective; 2d, the distance of the image from the object; 3d, the focus and the place of the field-lens when the latter is situated between the objective and the image.

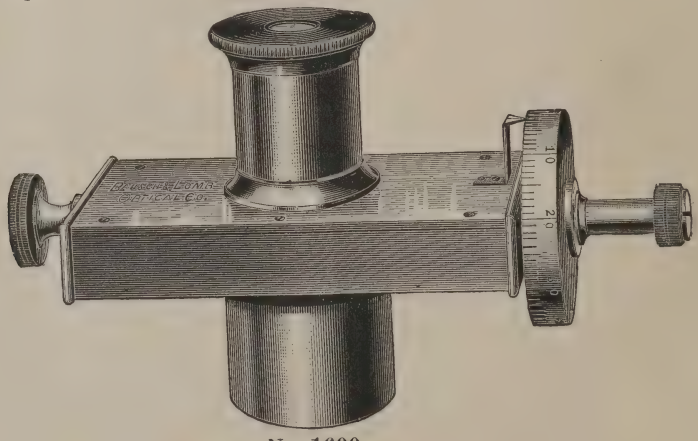
As these relative conditions are not of equal value in all microscopes, and consequently the relative size of the images, as formed by different objectives of the same rating, are not always the same, these values have to be ascertained for each microscope and objective separately.

To reach this result, a reliable stage micrometer should be used as an object, and its image accurately measured with the eyepiece micrometer.

A stage micrometer having the same divisions as the eyepiece micrometer is placed upon the stage of the microscope and the objective focused upon it. The number of divisions of the eyepiece micrometer contained in one division of the stage micrometer are now observed. We will suppose, for example, that eight divisions of the eyepiece micrometer equal one division of the stage micrometer. It therefore follows that the image presented in the plane of the eyepiece micrometer is magnified eight diameters; therefore, to determine the size of an object on the stage of the microscope, it is simply necessary to note the number of divisions of the eyepiece micrometer corresponding to the diameter of the image of the object and divide this number by eight. For example,—when using an eyepiece micrometer divided to tenths of millimeter, if the image of an object coincides with forty divisions of the micrometer, its real size will be $\frac{40}{10}$ mm. $\div 8 = \frac{5}{10}$ mm.

It is necessary to determine the value of the eyepiece micrometer for each combination of eyepiece and objective and for the tube length to be used. This value can be conveniently placed on the card accompanying the microscope, or will be determined and written in by us if the micrometer is ordered with the microscope.

Field of Large Filar Micrometer showing cross hairs and recording comb.



No. **1600.**

No.		Price.
1600.	**Filar Micrometer,** Large Size, adapted to any tube, in case, - -	**$45.00**

This micrometer is designed for making the most accurate possible measurements of minute objects under the microscope. It consists of a metal case in which a rectangular frame, carrying a suitable cross-hair, is moved laterally by a micrometer screw. For reference, a vertical and a longitudinal cross-hair are stretched across the field. The vertical hair is adjustable by means of the milled head on the left.

The cross-hairs and object are observed by means of a Ramsden positive eyepiece, mounted in a sliding tube, so that it may be readily focused.

The most important feature of the instrument, the micrometer screw, is cut with the utmost care and precision, and is made of either 0.5 millimeter, or $\frac{1}{50}$ inch pitch.

The motion of the screw is read on a circumference attached to the axis of the screw and divided to 100 parts.

The screw is moved by the milled head shown at the right in the figure, and for finer movements a vulcanite finger disk (not shown) of the same diameter as the graduated circumference is provided.

A metal comb, with teeth corresponding to one revolution of the screw, is placed in the lower part of the field, and serves to record the number of revolutions made.

The movable cross-hair has travel of 14 millimeters.

Revolution through one division of the graduated circumference indicates a motion of the cross-hair through 0.005 millimeter, or $\frac{1}{5000}$ inch.

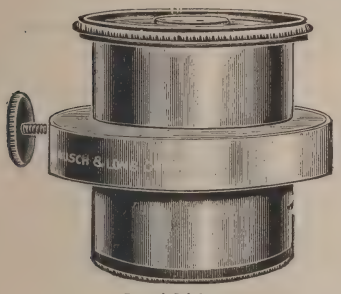
The magnifying power of the objective used in connection with the eyepiece should be very carefully determined, as the accuracy of the measurements depends entirely upon this factor.

The filar micrometer is attachable to any microscope tube, and when the tube is sent us, perfect fitting is assured, but where the tube can not be sent, its inside diameter should be given accurately. A clamping screw for firmly attaching to the microscope tube will be furnished if desired.

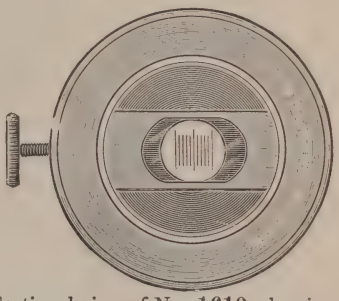
No. Price.

1605. **Filar Micrometer,** adapted to any tube, in case, small size, - - - **$32.00**

This micrometer is the same as No. 1600, but smaller, and the field is not provided with comb, and the fixed hair is not adjustable.



No. **1610.**
MICROMETER EYEPIECE WITH MOVABLE SCALE.



Sectional view of No. **1610,** showing arrangement of Movable Scale.

1610. **Micrometer Eyepiece,** with movable scale, - - - - - - **12.00**

This micrometer consists of a Continental eyepiece of 25 mm. focus, having a scale ruled on a polished glass plate and movable laterally by means of a screw with milled head. The eye lens is adjustable by sliding tube to suit the focus of different eyes. The scale being movable is easily placed so that the line from which the counting is started will exactly coincide with the margin of the object to be measured.

1615. **Micrometer Eyepiece,** with fixed scale, - - - - - **5.00**

A micrometer scale ruled on a polished glass disc, is cemented to the diaphragm of a Continental Eyepiece, of 25 mm. focus, the eye lens of which is mounted in a sliding tube in order that it may be focused sharply on the scale and its focus adjusted to suit the focus of different eyes.

1620. **Eyepiece Micrometer,** round glass disc, divisions of $\frac{1}{10}$ mm., fitted to any eyepiece, **1.50**

1645. **Measuring Disc,** for U. V., or W dissecting microscope, - - - **.75**

This disc is of glass centered to fit the opening in the stage of above microscopes and having a square centimeter divided into square millimeters ruled upon it.

1650. **Stage Micrometer,** on glass slip, 3 x 1 inch, divisions of $\frac{1}{10}$ and $\frac{1}{100}$ mm., in velvet lined case, - - - - - - - - - **3.50**

1655. **Stage Micrometer,** on glass slip, 3 x 1 inch divisions, of $\frac{1}{10}$ and $\frac{1}{100}$ inch, in velvet lined case, - - - - - - - - - - **2.00**

1660. **Stage Micrometer,** on glass slip, 3 x 1 inch, divisions of $\frac{1}{100}$ and $\frac{1}{1000}$ inch, in velvet lined case, - - - - - - - - - **2.50**

(Other graduations made to order.)

1675. **Steel Measure,** 15 cm. long graduated to 0.5 mm. and to 10ths, 20ths, 100ths; 4ths, 8ths, 16ths, 32ths, 64ths and 12ths, 24ths, 48ths, 96ths inch, each, - **1.25**

1680. **Steel Measure,** 6 inches long, graduated to 64ths inch, - - - - **.50**

1685. **Steel Caliper Measure,** 10 cm. long, graduated to mm., and with veriner reading to 10ths of a mm., - - - - - - - **1.75**

1690. **Boxwood Measure,** 24 inches long, with metal edge, graduated at 8ths and 16ths of an inch, - - - - - - - - - **1.00**

1695. **Boxwood Measure,** 12 inches long, graduated to 8ths of an inch, - - **.45**

1700. **Measuring Tape,** steel, in nickel plated metal case, with spring, graduated on one side in 16ths of an inch to 36 inches, and the other side in centimeters and millimeters to 1 meter, each, - - - - - - - **1.00**

No. Price.

1725. **Hæmacytometer,** after **Thoma,** with mixing pipette, for red corpuscles, in case, **$13.50**

1730. **Hæmacytometer,** after **Thoma,** with mixing pipette, for white corpuscles, **14.50**

1735. **Hæmacytometer,** after **Thoma,** with mixing pipette, for red and white corpuscles, in case, **20.00**

This apparatus consists of a cross line micrometer, being a square mm. divided into 400 squares, which forms the bottom of a cell, having an exact depth of 0.1 mm., and a blood mixing pipette, which is also necessary, very accurately calibrated. Instructions accompany the same.

1740. **Hæmacytometer,** after **Gowers,** in case, **2.50**

This apparatus is of simplified form, containing graduated testing tube, capillary pipette and test color in sealed tube. With instructions for use.

1745. **Hæmacytometer,** after **Gowers,** in case, **28.00**

Consisting (1) of a small pipette which, when filled to the mark on its stem, holds exactly 995 cubic millimeters. It is furnished with an india rubber tube and mouthpiece to facilitate filling and emptying; (2) a capillary tube marked to contain 5 cubic millimeters, with india rubber tube for filling, etc.; (3) a small glass jar in which the dilution is made; (4) a glass stirrer for mixing the blood and solution in the glass jar; (5) a brass stage plate carrying a glass slip, on which is a cell, one fifth of a millimeter deep, the bottom of which is divided into one tenth millimeter squares. Upon the top of the cell rests the cover glass, which is kept in its place by the pressure of two springs proceeding from the ends of the stage plate. Instruction circular accompanies each instrument.

1750. **Hæmaglobinometer,** after **Gowers,** in case, **10.00**

The apparatus consists of two glass tubes of exactly the same size. One contains a standard color of the tint of a dilution of 20 cubic mm. of blood, in 2 cubic centimeters of water (1 in 100). The second tube is graduated, 100 degrees—two centimeters (100 times twenty cubic millimeters). The twenty cubic millimeters are measured by a capillary pipette (similar to, but larger than that used for the Hæmacytometer). This quantity of blood to be tested is ejected into the bottom of the tube, a few drops of distilled water being first placed in the latter. The mixture is rapidly agitated by a rinsing action, the index finger closing the open end of the tube to prevent the coagulation of the blood. The distilled water is then added drop by drop (from the pipette stopper of a bottle supplied for that purpose) until the tint of the dilution is the same as that of the standard, and the amount of water which has been added (*i. e.*, the degree of dilution) indicates the amount of hæmoglobin.

Instructions accompany each instrument.

1755. **Hæmacytometer** and **Hæmaglobinometer,** after **Gowers,** as above, in one case, **37.50**

1760. **Hæmometer,** after **Fleischl,** in case, **35.00**

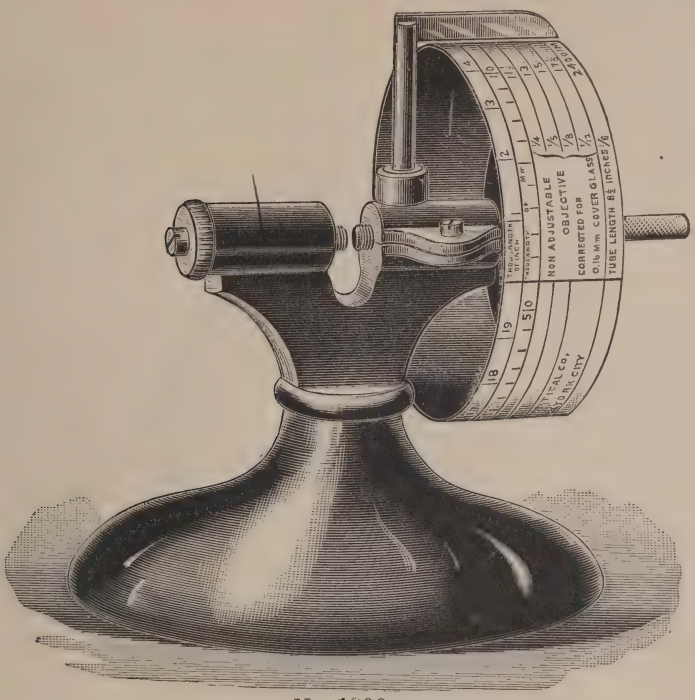
This standard apparatus is used for ascertaining the quantity of hæmoglobin in the blood. It differs advantageously from similar ones, now in use, in the following points:

Its manipulation is easier and requires less care.

The percentage of hæmoglobin can be read off rapidly and surely.

But a small quantity (1 drop) of the blood to be examined is required.

The apparatus is accompanied by instructions for use.



No. **1800.**

COVER GLASS GAUGE.

(Cut actual size.)

No. | Price.

1800. **Cover Glass Gauge,** - - - - - - - - - **$3.00**

This instrument should be found on the work table of every one possessing a microscope. With it the thickness of cover glass is quickly and accurately determined.

The glasses are measured by placing them in the recess between the points of the micrometer screws and bringing the movable screw in contact with the glass. The thickness is read off on the drum in thousandths of an inch and in hundredths of a millimeter.

When using non adjustable objectives cover-glass correction is easily effected by lengthening or shortening the draw-tube.

Scales are provided on this Cover Glass Gauge showing the exact tube length to be used for the cover measured, with either the $\frac{1}{4}$, $\frac{1}{6}$, $\frac{1}{8}$ or $\frac{1}{18}$ inch objective corrected for $8\frac{1}{2}$ inch tube length and for the $\frac{1}{6}$ inch corrected for 160 mm. tube length.

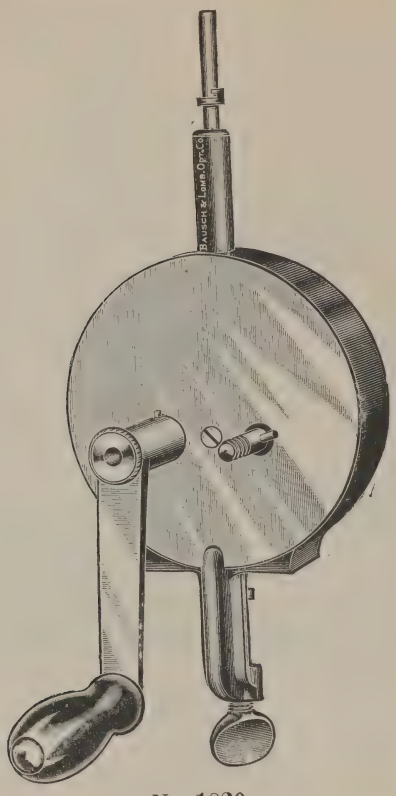
1805. **Rafter Apparatus** for counting organisms in water, with Eyepiece Micrometer, Cell, three Covers and 1 cc Pipette, complete, - - - - - **5.00**

This apparatus consists of a plane glass plate to which is cemented a cell, 50 mm. long, 20 mm. wide and 1 mm. deep; 3 covers of No. 3 glass and a disc micrometer ruled in squares; also a graduated pipette of 1 cubic centimeter capacity for filling the cell.

In use, one cubic centimeter of the water, containing the collected organisms, is carefully placed by means of the pipette in the cell and covered with one of the glass covers. The water with the organisms distributed through it, will then occupy an area of 1000 square millimeters and each sq. mm. of surface will represent a cubic millimeter of fluid.

To count the organisms in one of these cubes, it is necessary to so arrange the tube length of the microscope that one of the squares of the eyepiece micrometer will appear to cover an area of 1 square millimeter on the cell. This is easily accomplished by placing a stage micrometer with 1 mm. divisions on the stage of the microscope and adjusting the draw tube until one division of the eyepiece micrometer corresponds to one division of the stage micrometer.

The $\frac{2}{3}$ mm. objective is commonly used for this work.



No. **1820.**
IMPROVED HAND CENTRIFUGE.

HAEMATOKRIT, DR. DALAND'S SPUTUM SEDIMENTATION APPARATUS, URINE SEDIMENTATION APPARATUS.

The convenience of centrifugence for separating the constituents of fluids where a difference in the specific gravity of the particles exists has long been recognized, but its practical value has not been appreciated on account of the lack of a properly made apparatus for generating the speed required for rapid and thorough precipitation.

We are now able to offer a centrifuge capable of giving from 10,000 to 14,000 revolutions per minute, and of such light construction that it may be taken from place to place and used by the bedside of the patient, if desired.

The centrifuge proper, consists of a circular iron case 12 cm. in diameter and but 3.4 cm. in thickness, in which the gearing for producing the rotary motion, is placed. The case is provided with a clamp by which the instrument can be firmly fixed to a table or similar support. The gearing, which is extremely well made and of the very hard phosphor bronze metal, to prevent wear, communicates its motion to an upright spindle on the top of which the tubes containing the fluids to be examined are rotated in specially constructed metal frames. The first and second wheels of the gear have their axes extended to form attachments for the handle, enabling the speed to be changed with the greatest ease by simply shifting the handle from one axis to the other.

The Centrifuge is arranged to carry

Apparatus for the Volumetric estimation of red and white corpuscles in blood, —Daland's Haematokrit.

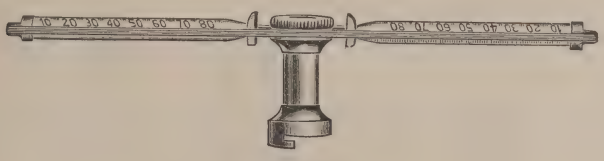
Apparatus for precipitating bacteria, elastic fibres, crystals, or other elements from sputum.

Apparatus for precipitating the solid and cellular elements of urine.

No. Price.

1820. Centrifuge only, with no attachments, - - - **$18.00**

The change from the high speed gearing necessary for blood and sputum sedimentation is effected by simply removing the handle from the high speed axis and attaching it to the low speed axis, thus reducing the speed from 14000 to 4000 per minute, this being sufficient for the precipitation of the lightest elements. The force required to drive the centrifuge with urinary attachment is less than that required for the higher speeds, notwithstanding the increased weight of the frame and tubes.



No. **1825.**

HAEMATOKRIT ATTACHMENT, COMPLETE, WITH PERCENTAGE TUBES.

1825. Haematokrit Attachment, after Dr. Judson Daland, of the University of Pennsylvania, with two percentage tubes, - **6.00**

1830. Percentage Tubes, extra, per pair, - - - **1.00**

The Haematokrit Attachment has been designed by Dr. Judson Daland and is now offered as a thoroughly reliable means of estimating the volume of red and white corpuscles in blood **without dilution.**

The Attachment consists of a frame carrying the two percentage tubes for the blood, and pipette for filling tubes.

Directions for use are included.

For description, see Dr. Judson Daland "*Volumetric Study of the red and white corpuscles in Human Blood in Health and Disease, by aid of the Haematokrit,*" University Medical Magazine, Philadelphia, November, 1891.

1835. Lancet, for drawing the blood, with concealed spear point, adjustable to govern the depth of puncture; also small needle for securing single drop of blood for microscopic examination. Caps with locking device to prevent the caps working loose in the pocket, - - - - - - - **1.50**

No. Price.

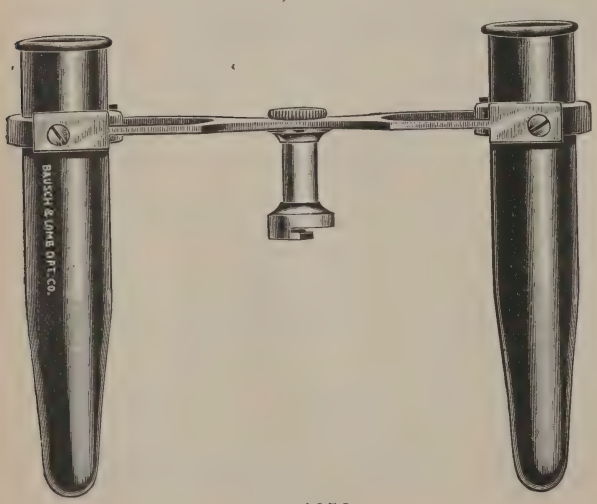
1840. Sputum Tubes, per pair, with pipette for filling, - - **$.40**

These tubes are of the same length as those used on the Haematokrit and have a bore of 2 mm. A special device in the outer cup of the Haematokrit frame permits the renewal of the elastic lining of the cup against which the tube bears.

It is absolutely necessary in order to make the examination of sputum for Bacilli of any diagnostic value that the lining of the cup with which the sputum comes in contact be entirely renewed each time an examination is made, as in those instruments in which provision is made for merely sterilizing the cup, *i. e., killing* the Bacilli, there is every danger that the germ may be carried over from one examination to another, as dead Bacteria are just as visible as living ones, and the cup might be "sterilized" many times without *removing* a single Bacillus.

A pipette with suitable attachment is supplied for filling the tubes.

See Thos. G. Ashton, M. D., and A. H. Stewart, M. D., "*Employment of centrifugal force as an aid to the examination of sputum.*" Medical News, Oct. 6th, 1894.



No. **1850.**

URINARY ATTACHMENT.
Of Aluminum, for Centrifuge.

No. **1855.**

GRADUATED SEDIMENTATION TUBE.

No. **1860.**

UNGRADUATED SEDIMENTATION TUBE.

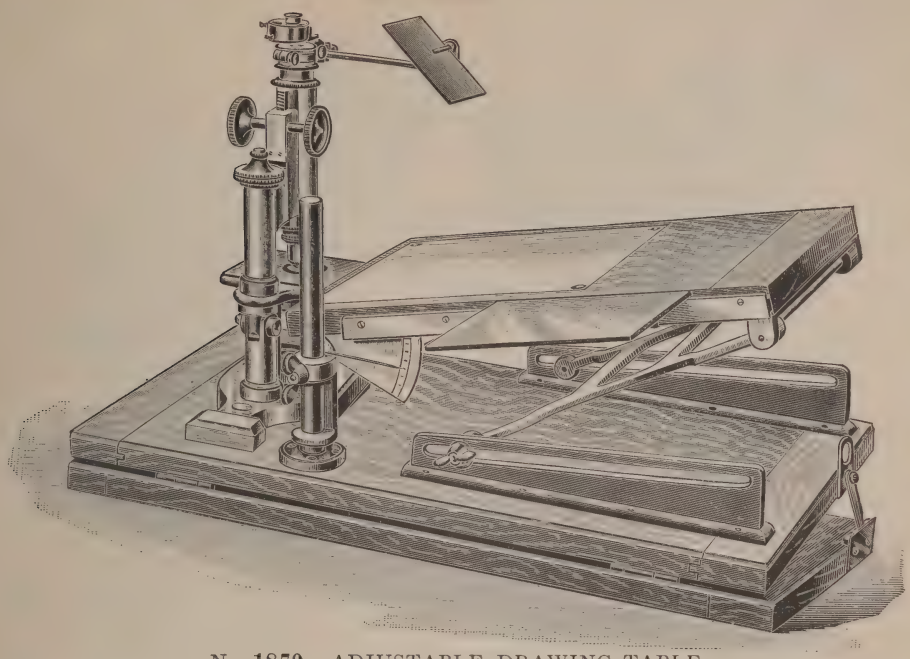
1850. Urine Sedimentation Apparatus, complete, with one graduated and one ungraduated tube, - - - - **6.00**

1855. Extra Sedimentation Tubes, graduated, each, - - **.75**

1860. Extra Sedimentation Tubes, ungraduated, each, - **.25**

The Tubes are conical in form and graduated to 10 cc. in tenths of a centimeter. The percentage of sediment can therefore be read directly on the graduated tube and microscopic examination made of precipitates in the ungraduated tube.

For further description, see C. W. Purdy, M. D., "*Practical Urinalysis and Urinary Diagnosis.*"



No. 1870.—ADJUSTABLE DRAWING TABLE.

No. Price.

1865. Adjustable Drawing Board for Camera Lucida, - - - - - **$12.00**

The necessary inclination of the mirror of the Abbe Camera Lucida to the drawing surface produces a constantly increasing elongation of the visual field when the drawing surface is parallel to the field of the microscope. The proportion of distortion increases as the distance from the perpendicular rays increases. It is, therefore, necessary to incline the drawing surface in order to obtain accurate reproductions of any considerable size.

It will also be noted that in order that the drawings may be of the same magnification as the image in the microscope, the distance from the drawing surface to the mirror, plus the distance from the mirror to the optical axis of the microscope, must equal the distance from the object to the axial aperture of the prism.

As the latter distance varies with objectives of varying focus, or with the tube length used, the distance of the drawing surface from the mirror must be correspondingly increased or decreased in order to obtain the true magnification. Inversely the magnification may be increased or decreased by altering the position of the drawing surface.

To meet the above requirements we have constructed the drawing board illustrated.

The base, which is of solid wood, with suitable cleats at the ends, supports both the microscope and drawing board proper, so that both may be moved without disarranging the image.

The drawing board is 250 x 400 mm., also provided with cleats. The end of the board next to the microscope is jointed to an arm, moving vertically on an upright metal pillar, and capable of being fixed at any point by a thumb screw as shown. The board has, by this means, a vertical adjustment to the height of 200 mm.

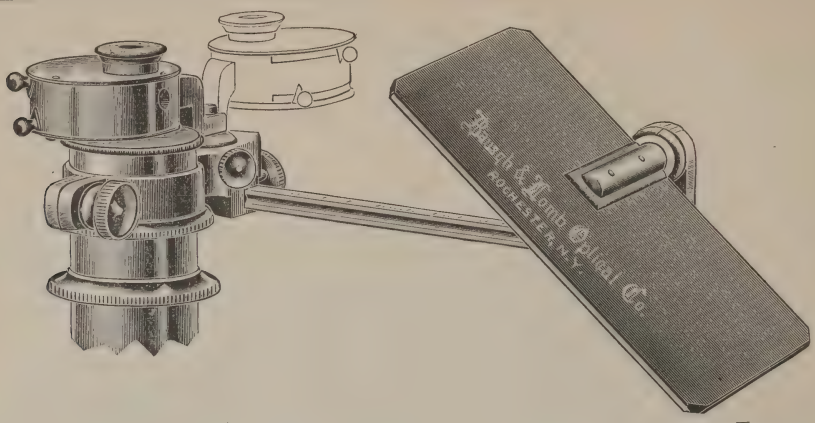
The angular adjustment is effected by means of the metal arm, supporting the outer end of the board. The upper end is hinged at two points to the drawing board, and the lower end slides on two inclined planes, giving a range of inclination amounting to about 35 degrees, which is read on a graduated arc, with indicator conveniently placed at the side of the board.

The support for the hand slides on a metal track, thus being instantly adjustable, and bringing the hand and arm in proper position for comfortable work. The hand rest is entirely detachable by simply sliding it off the track.

The microscope is held in position on the base by velvet lined wooden clamp.

1870. Drawing Board for Camera Lucida, as above, but with arrangement for inclining the microscope, - - - - - - - - - **14.00**

This additional convenience is secured by mounting the Drawing Board on an additional base board to which it is hinged, suitable catches for securing the desired inclination being provided.



No. **1875.**—ABBE CAMERA LUCIDA, AS APPLIED TO MICROSCOPE TUBE.

Prism carrier shown in outline thrown back as when not in use.

No.		Price.
1875.	**Abbe Camera Lucida,** New Improved Form, - - - - -	**$20.00**

This Camera Lucida presents a number of **important improvements** over the older forms, although the optical principle remains the same, viz.: The image of the paper and pencil point is superimposed upon the image of the object by means of an adjustable mirror and an Abbe's Prism, so that the object and pencil point are seen together.

The Abbe Prism is mounted in a cylindrical closed box, so constructed that it may be **rotated** about an axis, thus **bringing** the **prism over** the **eyepiece** of the microscope (which position is indicated by a pronounced click), or **carrying** it entirely **out of the way** of the observer.

In using the Camera Lucida, it rarely happens that the proper relative illumination exists between the drawing paper and the object, owing to the varying amount of light transmitted by objectives of different foci. With high power objectives, the paper is apt to appear too bright and thus drown the image of the object, the reverse occurring with low powers.

To correct this difficulty, a series of moderating glasses is arranged to rotate between the prism and the mirror and between the prism and the objective, being operated by the knobs shown at the side of the prism carrier. By means of the two sets of glasses a perfectly clear image of both pencil point and object is obtained with any combination of eyepiece and objective.

The whole prism arrangement is provided with a **centering device,** acting on the axis of the prism carrier and **moved by** two **milled heads** conveniently placed. By this device the **prism** may be **centered to** the **eye lens** of the microscope, thus securing equal illumination and sharp definition over the entire field.

The **mirror** is of unusually **large size,** giving an **increased field,** and is attached by a **graduated axis** to the arm.

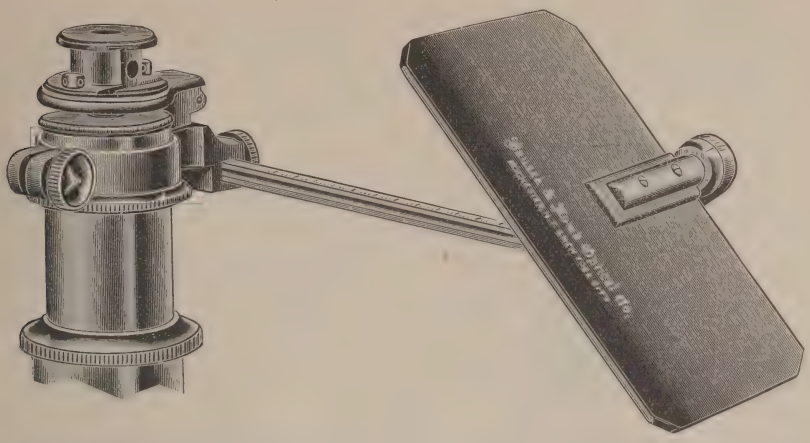
The **mirror arm** is **graduated** on its upper surface in centimeters and is **adjustable** in the mounting so that it may be brought as close as desired to the prism, extended a distance of 125 mm., or removed entirely.

Another feature of importance is the **attachment of** the **camera** to the microscope **by** means of a **collar** with binding screw. The collar slips over the tube of the microscope and thus permits the placing of the prism at the **proper distance from** the **eye lens** of the eyepiece.

No camera lucida can be used with more than one or two eyepieces, which is not provided with a means of adjusting it to the focus of the eye lens of the microscope.

This camera having such adjustment, **can be used** with **all of our eyepieces** with **equally good results.**

The eyepiece can be removed and others substituted without disturbing the camera.



No. 1880.—ABBE CAMERA LUCIDA, AS APPLIED TO MICROSCOPE TUBE.

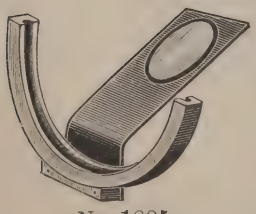
No.		Price.
1880.	**Abbe Camera Lucida,** simpler form, - - - - - - -	**$12.00**

This Camera Lucida embodies the same optical construction as the No. 1875, the Abbe prism, mirror and mirror bar being of the same dimensions.

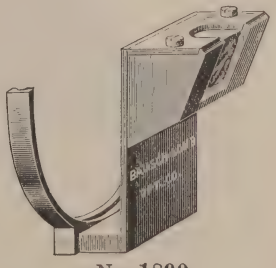
The prism carrier is arranged to swing back from the eyepiece by means of a hinge joint. The proper modification of the light is secured by colored glasses of different shades, which are slipped into slots between the mirror and prism or between the prism and eyepiece as desired.

The prism carrier is attached to the eyepiece by two capstan-head screws, passing through slots, by which the prism may be centered to the eye lens of the microscope.

This camera may be used with any power eyepiece of the compound microscope and with the dissecting lenses numbers 10, 30, 31, 32, 35, 36, 37, 38, 39, 40 and 42.



No. 1885.



No. 1890.

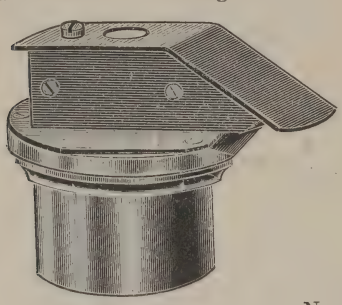
No.		Price.
1885.	**Camera Lucida,** in brass mounting, - - - - - -	**1.50**
1890.	**Wollaston's Camera Lucida,** - - - - - - -	**5.00**

This is the well known Wollaston prism, in simple mounting, attachable to the eyepiece of the microscope by a spring clamp. It gives an unreversed image of the object, and in this respect is superior to the other simple cameras. Best results are obtained when the microscope is in horizontal position.

No. Price.

1895. **Drawing Prism** (Dr. Piffard's model), - - - - - - - **$10.00**

This prism is intended to take the place of the Camera lucida. It is used with the tube of the microscope in a horizontal position and the image is projected downward onto the drawing paper. It is then directly viewed and traced at the observer's convenience. With a good lamp, satisfactory illumination can be obtained up to 250 or 300 diameters. The camera is mounted as shown in cut, and also with three binding screws for attachment to any tube.



No. **1900.**

1900. **Camera Lucida,** Double Prism, - - - - - - - - **7.50**

It may be used with the instrument in an upright or inclined position, and shows the image and pencil point clearly at the same time. It is superior to the the Wollaston in size of field and non-distortion of image.

1910. **Bristle Board,** extra superfine, size of sheet 13 x 16 inches, per dozen sheets, - **.90**

1915. **Tracing Paper,** very tough and transparent, thin, size of sheet 20 x 27 inches, per quire, - - - - - - - - - - **1.20**

1920. **Crow Quill Pens,** 1 dozen in a box, per dozen, - - - - - - **.60**

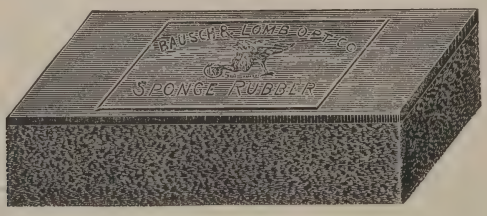
1925. **Holders for Crow Quill Pens,** per dozen, - - - - - - **.80**

1930. **Lithographic Crow Quill Pens, Joseph Gillott's,** per dozen, - - - **.60**

1935. **Higgins' Water Proof Drawing (India) Ink,** black, per bottle, - - **.35**

1940. **Paragon Lead Pencils,** H H H, very best quality, per dozen, - - - **1.40**

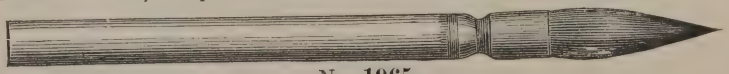
1945. **Paragon Lead Pencils,** H H H H H H, very best quality, per dozen, - **1.40**



No. **1950.**—SPONGE RUBBER.

1950. **Sponge Rubber,** for cleaning drawings, $2\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{5}{8}$ inch, - - - **.35**

1955. **Thumb Tacks,** stamped steel, made of one piece, $\frac{5}{8}$ inch diam., per dozen, **.10**

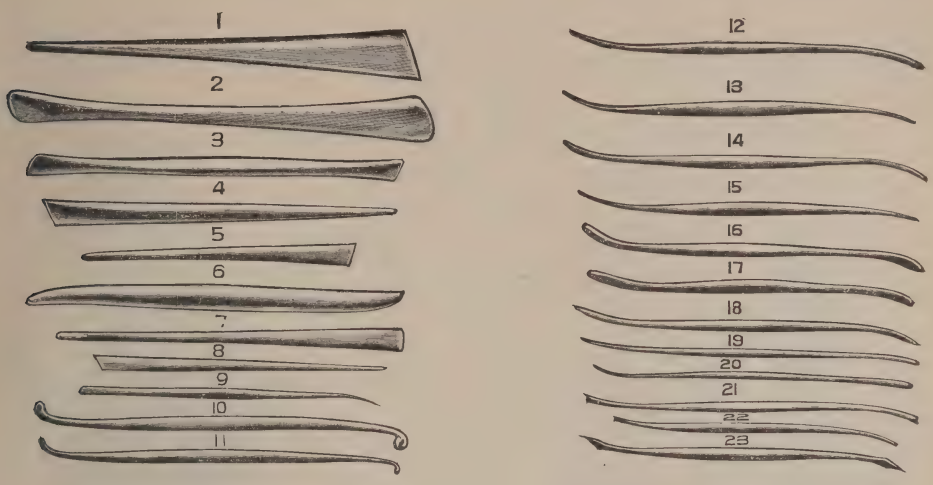


No. **1965.**

1960. **Camel's Hair Pencils,** miniature, in quills, red silk and gold thread binding.

Number	1	2	3	4	5	6	7	8	Assorted No. 1 to 8,
Each,	**$.04**	**.05**	**.06**	**.07**	**.08**	**.09**	**.10**	**.12**	**.65**
Dozen,	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**1.00**	**1.20**	

1965. **Camel's Hair Swan Quill Pencils,** pointed, $\frac{3}{4}$, $\frac{7}{8}$ or 1 inch long, red silk and gold thread binding, each, - - - - - - - - **.15**



No.		Price.
1975.	**Modeling Tools,** Nos. 1 or 2, each,	$ .65
	Modeling Tools, Nos. 10 or 11, each,	.75
	Modeling Tools, all other numbers, each,	.60
	Modeling Tools, complete set of 23,	13.50
	Modeling Tools (set *a*), for schools, Nos. 5, 8, 13, 17, 20, per set,	2.85
	Modeling Tools (set *b*), Nos. 1, 3, 5, 7, 10, 12, 13, 15, 17, 18, 19, per set,	6.35

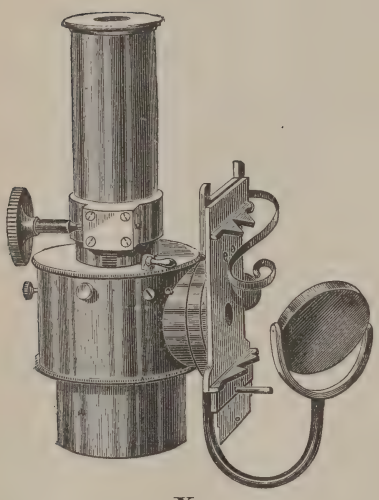
These tools are considered the best in the market. They are made of 23 different patterns, which will answer for any kind of modeling, figures, reconstuctions, etc. The shape of the tools is perfect, and the great advantage claimed is strength and cleanliness. Being made of pure aluminum, they are just as light as if made of wood; they are stronger and will not break under ordinary circumstances. They are finished bright, and a set of these tools is indispensable to a complete modeling outfit.

1980.	**Composite Clay** { per pound,	.35
	{ per package of 10 pounds,	3.00

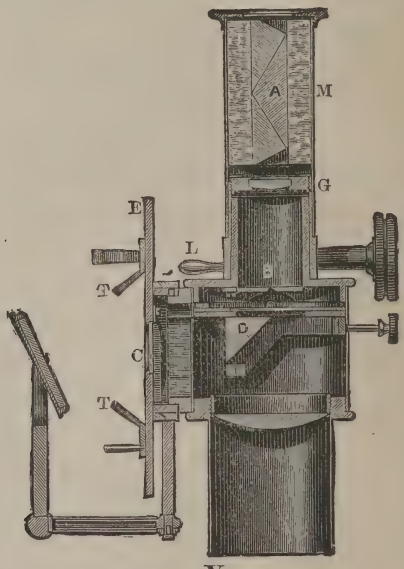
This is a new plastic material and perfect substitute for modeling clay and wax, will remain soft and pliable for years without drying like clay or hardening like wax. It can be worked exactly like clay and does not shrink or crack. This material is obtainable in 80 pound tubs, at a proportionately lower price for that quantity.

1985.	**Bees Wax,** pure, for reconstruction and modeling in embryological work, per pound in cakes,	.75
1990.	**Plates of Bees Wax,** 14 x 22 cm. and 1 mm. thick, per dozen,	1.50
1995.	**Plates of Bees Wax,** 14 x 22 cm. and 2 mm. thick, per dozen,	1.60
1997.	**Card Board** for reconstruction work in embryology, white on one side for sketching, cuts easily with a knife, size of sheet 13 x 19 inches, 1 or 1.5 mm. thick, per dozen sheets,	.30

SORBY-BROWNING SPECTROSCOPIC EYE-PIECE.



X.



Y.

No. **2000.**

No.		Price.
2000.	**Micro-Spectroscope,** Sorby-Browning, with rack to eyepiece, in case, -	**$60.00**

This eyepiece being applicable to any microscope in place of the regular eye-piece, furnishes a very convenient and accurate means of examining the spectrum of any microscopic object and of comparing its spectrum directly with the solar spectrum or the spectrum of any other substance. The two spectra may be seen side by side, if desired.

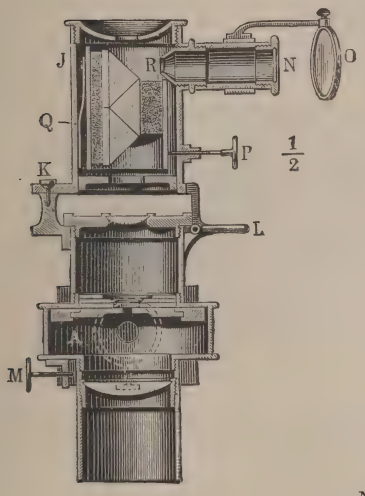
The spectroscopic eyepiece consists of an ordinary ocular, the eye lens of which is adjustable by the rack and pinion shown in the figure.

Light passing through the ocular is dispersed by the train of flint and crown glass prisms "A," which are so arranged as to give the emergent ray the same direction as that of the immergent ray.

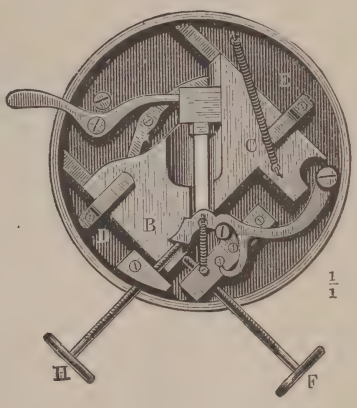
The spectral image is limited by an adjustable slit B, the length or width of which is controlled by the small milled heads shown on the sides of X. The spectrum of an object on the stage of the microscope would thus be formed by a ray passing directly through the objective and eyepiece and separated into its elements by the train of prisms.

The object, the spectrum of which is to be compared, is placed on the stage E, which has proper supports for either vial or glass slip, and light reflected through it by the adjustable mirror into the right-angled prism D, from which it is projected through the slit B to the dispersing prisms.

ABBE SPECTROSCOPIC EYEPIECE.



Section through center line of the whole instrument. (½ size.)



Slit Mechanism. (Cut, full size.)

No. **2010.**

No.		Price.
2010.	**Spectroscopic Eyepiece** (Micro-Spectroscope), after Abbe, in case, with a number of lithographic scales for recording observations, - - - -	**$80.00**

The Abbe eyepiece resembles the Sorby-Browning Spectroscopic eyepiece described on page 106, in general construction, there being, however, the following additional advantages:

The length or width of the slit which limits the spectral image is changeable by a very ingenious contrivance (Merz movement) actuated by two milled heads as shown in the cut. F controls the width of the slit and H its length.

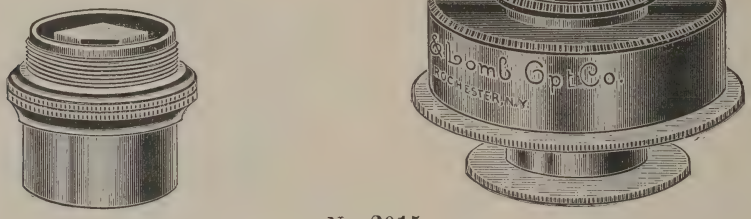
The train of dispersing prisms is so mounted that the whole may be turned aside on the pivot K, permitting the object to be adjusted under the objective, or it may be retained in the optical axis by the spring catch L.

A delicate numbered scale in the scale tube N is projected by means of the lens R on to the surface of the last of the dispersing prisms, from which it is reflected to the eye, appearing with the spectrum and indicating in decimals of a micron the wave lengths of the various sections of the spectrum. The scale is adjustable to the correct position on the spectrum by the milled head P which changes the angle of the surface which reflects the scale.

INSTRUMENTS AND APPARATUS FOR POLARIZATION,

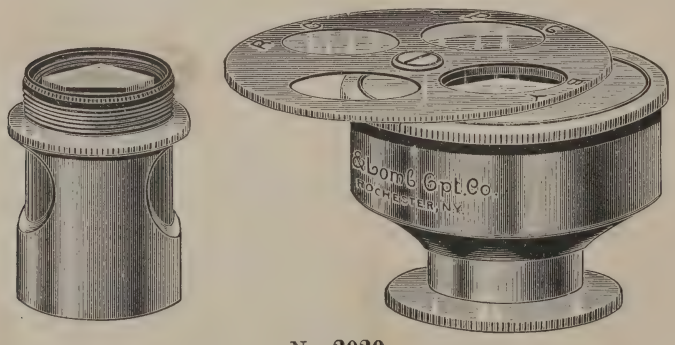
AND AS USED IN PHYSICAL OPTICS.

Light polarized by means of a Nicol prism, Polarizer, placed under the stage of the microscope, passes through the object and is received by the objective above, after which it meets a second Nicol prism, Analyzer, which enables us to observe that the light has been polarized. The sensitiveness of the polariscope is greatly increased by using a Selenite between the Polarizer and the Analyzer.



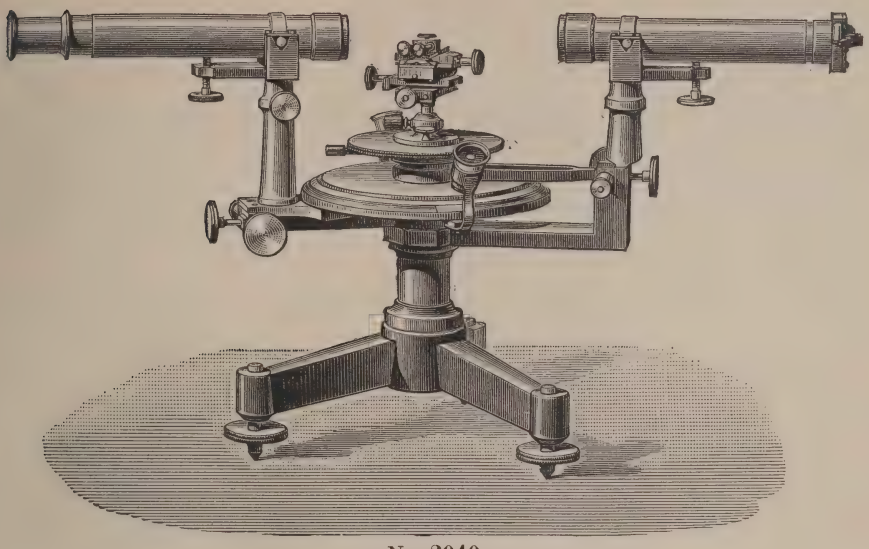
No. **2015.**

No.		Price.
2015.	**Polariscope,** with square face Nicol prisms and 1 selenite, in case, - - The polarizer is fixed in brass mounting and rotated by a large milled head. The analyzer is fixed in a short brass tube with society screw to attach to the nosepiece of the microscope.	**$15.00**
2017.	**Polariscope,** same as above, but with the analyzer in revolving mounting, in case,	**16.50**



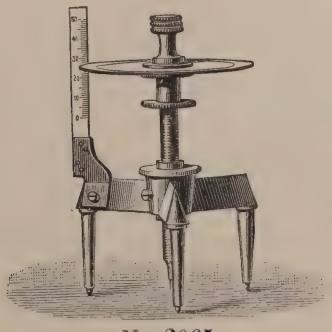
No. **2020.**

2020.	**Polariscope,** with large square face Nicol prisms, in case, - - - The polarizer is fixed in brass mounting and rotated by a large milled head. Polarizer has three selenites mounted in a revolving disk, having one clear Aperture. Analyzer is arranged in brass mounting and can be revolved. It has society screw and can be attached to the nosepiece of the microscope. This Polariscope can be fitted only to adjustable substages.	**25.00**
2025.	**Polariscope,** with large square face Nicol prisms, in case, - - - The polarizer is fixed in brass mounting and rotated by a large milled head. Polarizer is provided with three selenites mounted in revolving disk. Analyzer is mounted in graduated disk, arranged to set over the neck of eyepiece, and revolves thereon. Indicator is provided as well as cross hairs in eyepiece.	**35.00**
2030.	**Polariscope,** with extra large Nicol prisms, in case, - - - - The polarizer is fixed in brass mounting and rotated by a large milled head and has three selenites. The analyzer is connected with Goniometer and separate eyepiece, provided with cross hairs.	**45.00**



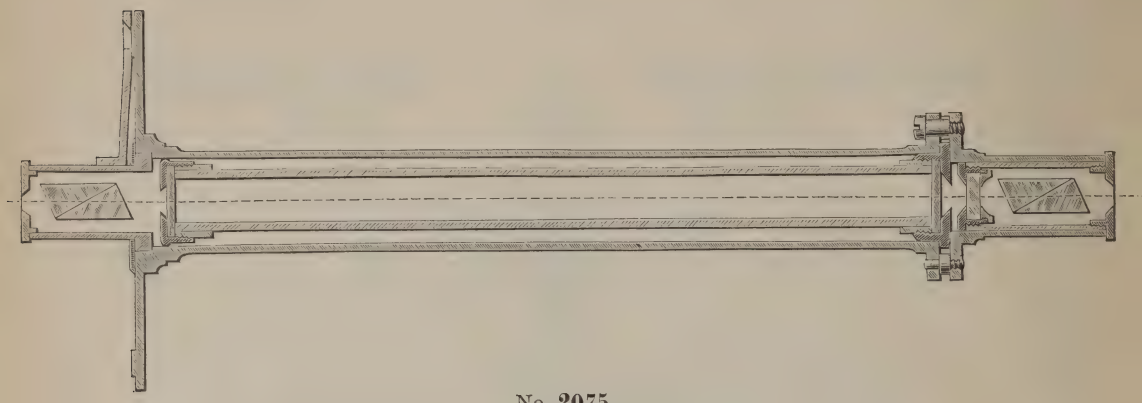
No. **2040.**

No.		Price.
2040.	**Combined Spectrometer and Goniometer,** - - - - - - This instrument is offered as a most desirable piece of laboratory apparatus. It is mounted on a heavy tripod base with leveling screws. The circle is 15 cm. in diameter, graduated on silver to $\frac{1}{6}\frac{1}{0}°$, and reading to 20 seconds by means of two verniers and microscopes placed 180° apart. Telescope and collimeter are of 22 mm. aperture and equipped with lenses of high quality. The telescope carries a mirror eyepiece. A comparsion prism is attached to the collimator. A heavy flint dispersing prism, with 35 mm. circular faces accompanies the instrument.	**$125.00**
2045.	**Support for Centering Crystals,** to be used with No. 2040, as shown in cut,	**34.00**
2050.	**Grating Holder,** to be used with No. 2040, - - - - - -	**12.00**
2055.	**Complimentary Objective,** to be used with No. 2040, to facilitate in the adjustment of crystals, - - - - - - - - - -	**9.00**



No. **2065.**

2065.	**Spherometer,** with ground glass plate, not shown in cut, as a base, - -	**36.00**



No. **2075.**

No. Price.

2075. **Saccharometer,** - - - - - - - - - - **$35.00**

This instrument is used for estimating the percentage of sugar in fluids. With tube 200 mm. long, for liquids made to slide in a brass tube, which carries a polarizer and double quartz plate at one end and at the other an analyzer with divided circle. The circle is divided to semi-degrees, and tenths can be estimated with accuracy. Observation is made by adjusting the so-called transition color on both halves of the quartz plate, the tube being directed by hand towards a white surface. Only suitable for fluids containing a small percentage of sugar. Directions accompany each instrument.

2080. **Polarizing Apparatus,** after Nœrremberg, - - - - - **60.00**

This apparatus is of the most recent construction, with wide field, wherein the poles of the rings of hyposulphate of soda may be viewed simultaneously. With draw tube for increasing the amplification of the axial images.

2085. **Achromatic Telescope Objectives,** guaranteed of finest quality, mounted in cell,

	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*
Diam in inches,	1	$1\frac{3}{16}$	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Focus,	$5\frac{1}{4}$	7	8	$11\frac{1}{4}$	$14\frac{1}{2}$	$16\frac{1}{2}$	20	24	30	42
Price, each,	**$5.00**	**5.50**	**5.50**	**6.50**	**6.50**	**6.50**	**9.00**	**12.00**	**25.00**	**40.00**

All of the above objectives of $1\frac{1}{2}$ inch and larger diameter we make to order, and are of a quality which will equal the best extant. The foci for the different sizes are in our opinion the most desirable, but may be changed according to the wish of the purchaser.

2090. **Celestial Eyepiece,** Huyghenian, any power, } These Eyepieces are } **4.50**

2095. **Celestial Eyepiece,** Periscopic, any power, } threaded to receive } **8.00**

2100. **Celestial Eyepiece,** Solid, any power, } Sun Shade, No. 2115. } **6.00**

2105. **Ramsden Positive Eyepiece,** - - - - - - **4.00**

2110. **Diagonal Eyepiece,** - - - - - - - - - **15.00**

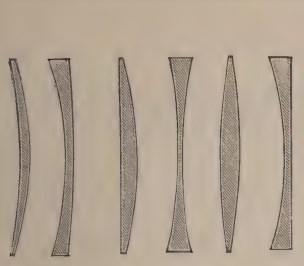
2115. **Sun-shade,** fitted to either of the above, - - - - - **1.00**

2120. **Sun-shade,** wedge shape, giving intermediate tints between light and very dark, **5.00**

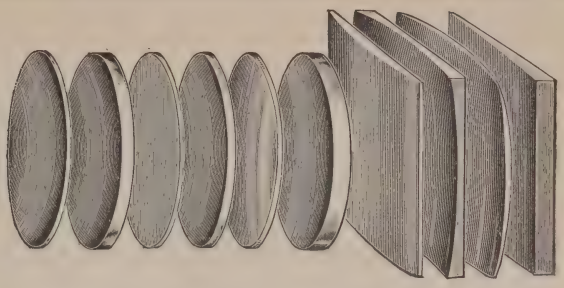
2125. **Finder,** with objective $1\frac{3}{16}$ inch diameter, with cap, in lacquered tube, with draw-tube and eyepiece with cross-wires, - - - - - **16.00**

2130. **Same** as 2125, with the addition of centering standards, - - - **20.00**

2135. **Terrestrial Eyepiece,** - - - - - - - - - **7.50**



SECTIONS OF SPHERICAL LENSES.



SPHERICAL LENSES. CYLINDRICAL LENSES.

No. **2155.**

DEMONSTRATION LENSES.

No.		Price.
2150.	**Demonstration Lenses,** set of six, 1½ inches diameter, in box, - -	**$1.25**
	These show the form of the various kinds of lenses, viz: Double convex, double concave, plano convex, plano concave, meniscus convex and meniscus concave.	
2155.	**Demonstration Lenses,** set of ten, 1½ inches in diameter, in box, - -	**2.00**
	Same as above, in addition one lens each, cylindrical convex, cylindrical concave, spherical-cylindrical and prismatic.	
2160.	**Demonstration Lenses,** set of six, 3 inches diameter, in box, - - -	**4.50**
	Consisting of the same lenses as No. 2150.	
2165.	**Demonstration Lenses,** set of ten, 3 inches diameter, in box, - - -	**7.50**
	Consisting of the same lenses as No. 2155.	

2175. Double convex or concave Lenses.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*o*
Diam. in inches,	1/16	1/8	3/16	1/4	3/8	1/2	5/8	3/4	1	1½	2	2½	3
Focus in inches,	1/8	1/4	3/8	1/2	3/4	1	1¼	1½	2	3	4	5	6
Ground edges, each,	**$ .75**	**.75**	**.75**	**.90**	**.90**	**.90**	**.90**	**.90**	**.90**	**.50**	**.60**	**.75**	**1.25**
Perfectly centered, ea.,	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.25**	**1.25**	**1.25**	**.85**	**.95**	**1.25**	**1.75**

2180. Plano convex or concave Lenses.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*o*
Diam. in inches,	1/16	1/8	3/16	1/4	3/8	1/2	5/8	3/4	1	1½	2	2½	3
Focus in inches,	1/8	1/4	3/8	1/2	3/4	1	1¼	1½	2	3	4	5	6
Ground edges, each,	**$ .65**	**.65**	**.65**	**.75**	**.75**	**.75**	**.75**	**.75**	**.75**	**.85**	**1.00**	**1.25**	**1.50**
Perfectly centered, ea.,	**.90**	**.90**	**.90**	**1.00**	**1.00**	**1.00**	**1.10**	**1.10**	**1.10**	**1.25**	**1.40**	**1.75**	**2.00**

2185. Meniscus convex or concave Lenses.

Letter,	*a*	*b*	*c*	*d*	*e*
Diam. in inches,	1	1½	2	2½	3
Focus in inches,	2	3	4	5	6
Ground edges, each,	**$1.50**	**1.75**	**2.00**	**2.50**	**3.00**
Perfectly centered, each,	**2.00**	**2.25**	**2.50**	**3.00**	**3.75**

2190. Double convex or concave Lenses, of large diameter.

Letter,	*a*	*b*	*c*	*d*	*e*
Diam. in inches,	4	5	6	7	8
Focus in inches,	12–72	18–72	24–72	30–72	36–72
Ground edges, each,	**$2.00**	**3.00**	**4.00**	**6.00**	**8.00**
Perfectly centered, each,	**2.50**	**3.75**	**5.00**	**7.50**	**10.00**

2195. Meniscus convex or concave lenses.

Letter,	*a*	*b*	*c*	*d*	*e*
Diam. in inches,	4	5	6	7	8
Focus in inches,	12–72	18–72	24–72	30–72	36–72
Ground edges, each,	**$4.00**	**6.00**	**8.00**	**10.00**	**12.00**
Perfectly centered, each,	**5.00**	**7.50**	**10.00**	**12.00**	**15.00**

2200. Nicol's Prisms, diagonal face, opening angle 31° 16′.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
Mm.,	6	7	8	9	10	11	12	13	14
Price, each,	**$1.50**	**1.75**	**2.00**	**2.50**	**3.25**	**3.75**	**4.50**	**5.50**	**6.50**

2205. Nicol's Prisms, square face, wide field, opening angle 31° 16′.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
Mm.,	6	7	8	9	10	11	12	13	14
Price, each,	**$1.75**	**2.00**	**2.50**	**3.00**	**3.75**	**4.50**	**5.00**	**6.00**	**7.00**

2210. Rectangular Prisms, of crown glass, accurately ground and polished.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
Mm. wide,	6	12	18	25	32	38	44	50	62
Price, each,	**$2.00**	**2.25**	**2.50**	**3.00**	**4.00**	**5.00**	**6.00**	**7.50**	**10.00**

2215. Rectangular Prisms, of light and heavy flint glass, accurately ground and polished.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*
Mm. wide,	6	12	18	25	32	38	44	50	62
Light, each,	**$2.00**	**2.25**	**2.50**	**3.00**	**4.00**	**5.00**	**6.00**	**7.50**	**10.00**
Heavy, each,	**4.00**	**4.50**	**5.00**	**6.00**	**8.00**	**10.00**	**12.00**	**15.00**	**20.00**

2220. Equilateral Prisms, of crown glass, long.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*
Size mm.	18 x 36	25 x 50	32 x 64	38 x 76	45 x 90	50 x 100	62 x 124
Price, each,	**$4.00**	**5.00**	**6.50**	**8.00**	**11.00**	**14.50**	**19.00**

2222. Equilateral Prisms, of light and heavy Flint Glass, accurately ground and polished.

Letter,	*a*	*b*	*c*	*d*	*e*	*f*	*g*
Size, mm.,	18 x 36	25 x 50	32 x 64	38 x 76	45 x 90	50 x 100	62 x 124
Light, each,	**$4.00**	**5.00**	**6.50**	**8.00**	**11.00**	**14.50**	**19.00**
Heavy, each,	**8.00**	**10.00**	**13.00**	**16.00**	**22.00**	**29.00**	**38.00**

2225. Bisulphide of Carbon Prism, large models, each, - - - - **$7.50**
This is a hollow prism, accurately ground, bottle shaped, with glass stopper.

2230. Quartz Wedge Compensator, mounted on glass plate, 55 x 14 mm., each, - **6.00**

2235. Quartz Plate, Bertrand's Quadrant, 24 mm. diam., mounted, each, - - **10.00**

2240. Gypsum Plate, red of the first order, 12 mm. diam., unmounted, each, - **2.00**

2245. Selenite Films, 18 mm. diam., unmounted, red and green, - - - **1.50**

2250. " " " " " blue and yellow, - - - **1.50**

2255. " " " " " purple and green, - - **1.50**

2260. Quarter Undulation Mica Plate, 12 mm. diam., unmounted, - - - **2.00**

2265. Plane Mirror, ground and polished, 4 inches diameter, mounted in protecting metal back, with handle, each, - - - - - - **3.50**

2270. Spherical Concave Mirror, ground and polished, 4 inches diameter, mounted in protecting metal back, with handle, each, - - - - - **3.50**

2275. Spherical Convex Mirror, ground and polished, 4 inches diameter, mounted in protecting metal back, with handle, each, - - - - - **3.50**

2280. Cylindrical Concave Mirror, ground and polished, 4 inches diameter, mounted in protecting metal back, with handle, each, - - - - - **4.00**

2285. Cylindrical Convex Mirror, ground and polished, 4 inches diameter, mounted in protecting metal back, with handle, each, - - - - - **4.00**

Microtomes and Apparatus for Microtomy.

LABORATORY MICROTOMES.

PATENTED.

Our long experience in the manufacture of microtomes and the large number which we have made, has enabled us to overcome the defects inherent in most of the forms and add improvements which permit work of the utmost precision to be done with a comfort and facility not possible in other constructions.

The movable parts are fitted with an exactness never surpassed in the construction of a microtome, and superior to that of most of the forms offered as first class. In addition to the other new features, we have introduced one important innovation, which has been very successful in our microscopes, of rounding off the corners of the instrument, thus making it not only pleasant to handle, but obviating the liability of abrading the skin when working, which is of considerable importance where infectious material is to be handled. The unpolished parts are heavily enameled, and the finished portions nickled to prevent rusting.

The Microtomes may be described as consisting of three parts :

The **Stand,** consisting of the Base, the curved Arm and the horizontal V shaped Bed,

The **Knife Block,** which carries the knife, and

The **Carriage,** adjustable on the vertical portion of the stand, and carrying the object Clamp, and the entire Feed Arrangement.

The Stand is of **one solid casting,** which insures **absolute rigidity** of all the parts. We were led to adopt this construction by the defects of our early type, in which the different parts were screwed together, thus endangering the accuracy of the fittings by changes in the tension of the screws holding the parts together, especially if removed to facilitate cleaning; warping of the parts and general lack of rigidity.

Removable metal pan in the base collects the drip from the knife.

An extra pan (see page 119) attachable to the clamp, for collecting the fluid from the knife and object, is furnished when desired.

The Knife Block, carrying the knife, slides on three narrow, perfectly parallel plane surfaces, is triangular in section and of unusual length, to insure perfect uniformity of motion when cutting, and to prevent the possibility of any vertical or lateral displacement of the knife, even when cutting very hard substances, and securing the minimum of friction compatible with these qualities. The knife is clamped to the upper surface of the block by a thumb screw which slides in a T shaped groove, extending along the entire upper side of the block. This arrangement permits the adjustment of the knife to **any angle** with the object, and to **any position** on the block. Each block is carefully fitted to the bed, and works with extreme delicacy and regularity of movement.

The Carriage is a stirrup-shaped solid casting, **movable** on a perfectly fitted V slide along the **whole length** of the front of the Microtome Stand. It can be clamped perfectly rigid at any point by means of the thumb screws at either side. The movable feature of the carriage is a very important one, as it enables the object to be perfectly adjusted to the knife, and permits the use of the whole edge of the knife. **No other Microtome made is provided with this convenience.**

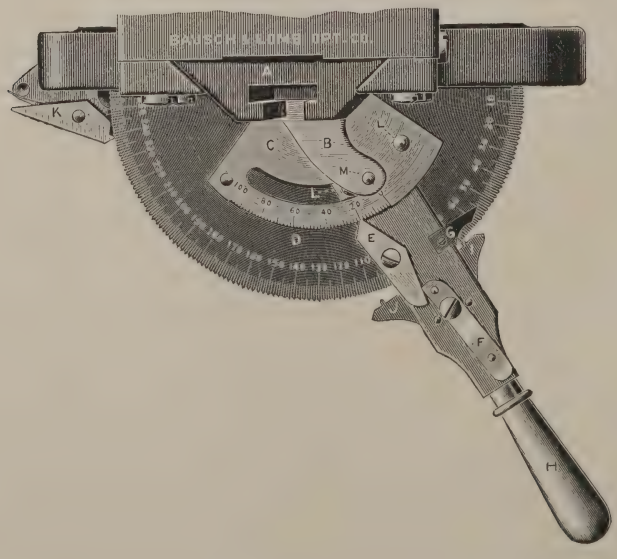
It will thus be seen that this Microtome is adapted for both cellodin and paraffine work, including serial sectioning.

The object clamp is carried on an arm which is fitted to a slide in the carriage and is constructed with special reference to convenience of manipulation.

Our Universal Clamp No. 2 or Naples Clamp No. 3, in connection with the Orienting Apparatus, is recommended for the more delicate operations and when the most convenient apparatus is desired.

The arm carrying the entire object clamp is arranged to slide vertically in a groove in the front of the slide piece, allowing the **object** to be **rapidly elevated** or **depressed** with reference to the knife, regardless of the position of the micrometer screw.

The feed arrangement is by micrometer screw, working in an adjustable block in the lower part of the carriage, and acting on the base of the slide piece. The screw is cut with the utmost care and accuracy, the pitch of the threads being 0.5 mm. The disk of the micrometer screw is graduated to 500 parts. On the margin, notches are cut of such size that one notch corresponds to two of the divisions on the disk.



FEED MECHANISM OF LABORATORY MICROTOMES.

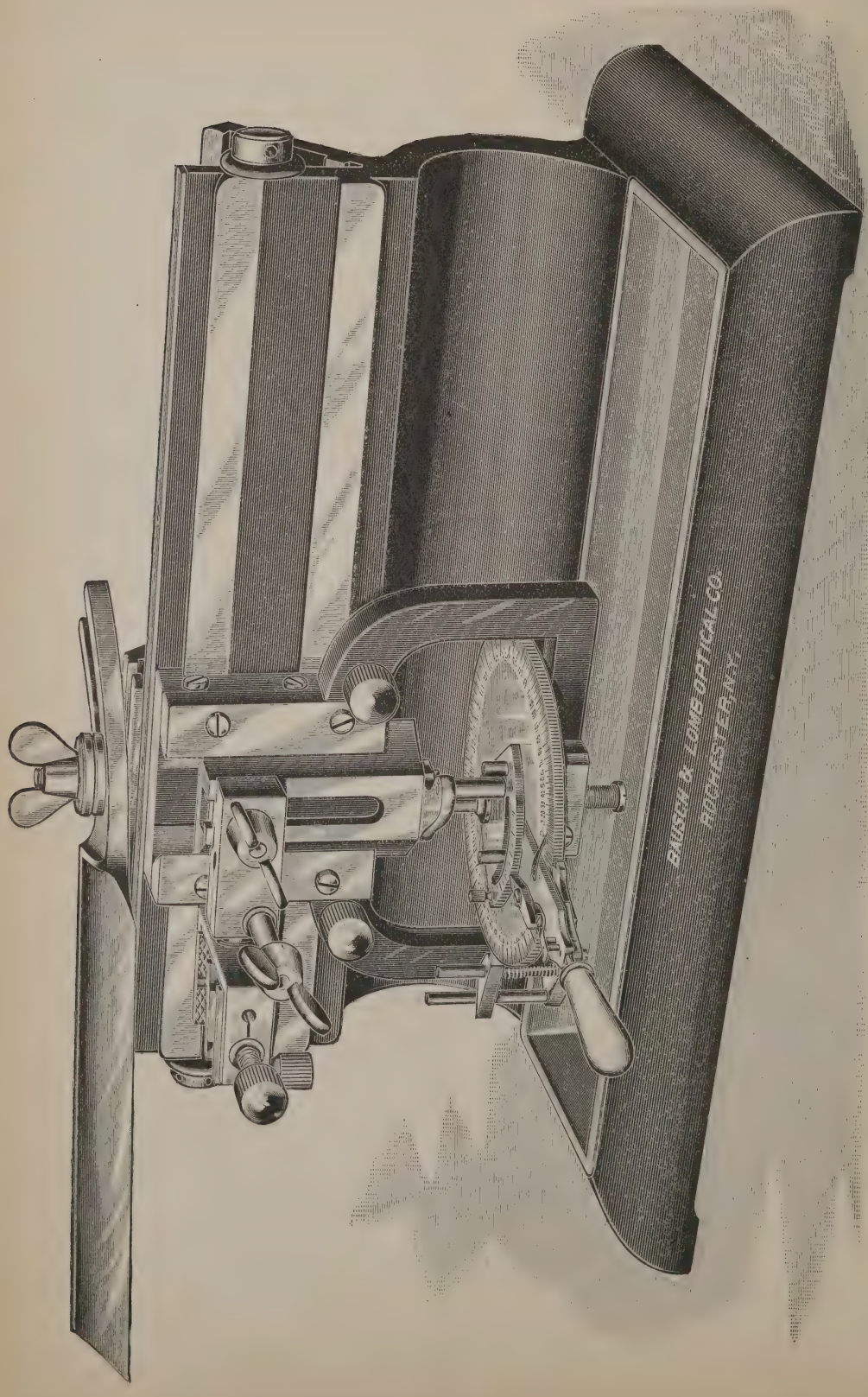
Feed mechanism. We have devised a method of regulating the thickness of sections which we are confident offers advantages not possessed by any microtome of similar type. It is readily set for thickness and the motion is **definitely limited,** thus permitting the successive cutting of sections to any extent without variation in thickness and **without** being **dependent upon** an **audible click** or **reading** the **graduation,** although permitting the latter if desired. By this arrangement the whole attention can be given to the cutting proper, thus obtaining much more perfect results, especially in serial and very thin sectioning, and saving a great deal of time. The finest feed is 2 micra.

A represents the slide piece with projecting arm B, from the end of which a heavy stud M projects downward. C is a quadrant pivoted to the lower side of the arm B and slotted to receive a stud projecting from the main feed lever H. The quadrant bears a scale one division of which corresponds to two divisions on the head of micrometer screw D and the edge is toothed to correspond with the graduations. The main feed lever H is pivoted at its proximal end at the same point as the quadrant so as to move with it when desired.

It bears a pointer G, and a pawl E, which engages the teeth on the margin of the quadrant, and the small lever, F, which controls pawl E. In use, F is brought to a central position on H, releasing E. E is then set at the graduation indicating the thickness of section desired, stop L being held against the stud M meanwhile. F is then moved to the right clamping E firmly in position, and at the same time causing the pawl I to engage the teeth of D. A movement of the lever H to the right will now cause the quadrant and also the micrometer screw to rotate until the stop L′ strikes the stud M, which is stationary. The distance moved will be equal to the arc indicated between zero on the quadrant and the graduation at which E is set. H being returned to the left until L strikes on M, I does not engage the teeth of D, and D is prevented by the brake, K, from rotating backward. It will thus be seen that the feed being set, a simple movement from left to right elevates the object the exact distance required, without the possibility of going beyond the limit and raising it too much.

All the movable parts of the Microtome should be kept as free from dust as possible, and well lubricated with dental or clock oil only.

The knives furnished are of the best hand forged English steel and are guaranteed of the proper temper and hardness for microtome work. They are furnished properly sharpened for cutting, but of course, should be gently stropped before using.



No. **2400 A.**
LARGE LABORATORY MICROTOME.
Fitted with Universal Clamp No. 2, and Knife.

LABORATORY MICROTOME LARGE SIZE.

No. **2400.**

The dimensions of the Laboratory Microtome, large size, are as follows:

Length of Bed, ... 312 mm.
Height, ... 208 mm.
Vertical Movement of Object by Micrometer Screw, .. 20 mm.
Vertical Adjustment of Object by Clamp, ... 46 mm.
Diameter of Head of Micrometer Screw, ... 90 mm.
Graduations on Head of Micrometer Screw, ... 500
Pitch of Micrometer Screw, ... 0.5 mm.
Finest Degree of Feed, ... 2 micra.
Length of Cutting Edge of Knife, ... 156 mm.

No.		Price.
2400A.	**Large Laboratory Microtome,** with Universal Clamp No. 2 (2440), and knife, with 156 millimeter cutting edge,	**$60.00**
2400B.	**Large Laboratory Microtome,** with Universal Clamp No. 2 (2440), Knife Support No. 2435, and Knife with 156 millimeter cutting edge,	**66.00**
2400C.	**Large Laboratory Microtome,** with Universal Clamp No. 2 (2440), Knife Support No. 2435, Automatic Feed Attachment No. 2430, and Knife with 156 millimeter cutting edge,	**81.00**
2400D.	**Large Laboratory Microtome,** with Naples Universal Clamp No. 3 (2450), and Knife with 156 millimeter cutting edge,	**72.00**
2400E.	**Large Laboratory Microtome,** with Naples Universal Clamp No. 3 (2450), Knife Support No. 2435, and Knife with 156 millimeter cutting edge,	**78.00**
2400F.	**Large Laboratory Microtome,** with Naples Universal Clamp No. 3, Knife Support No. 2435, Automatic Feed Attachment No. 2430, and Knife with 156 millimeter cutting edge,	**93.00**
2400G.	**Large Laboratory Microtome,** with Naples Universal Clamp No. 3 (2450), Knife Support No. 2435, Automatic Feed Attachment No. 2430, Orienting Apparatus, complete, No. 2455, and Knife with 156 millimeter cutting edge,	**110.50**
2402.	**Polished Cherry Case,** with handle and lock, and receptacle for knife case for Large Laboratory Microtome,	**6.00**

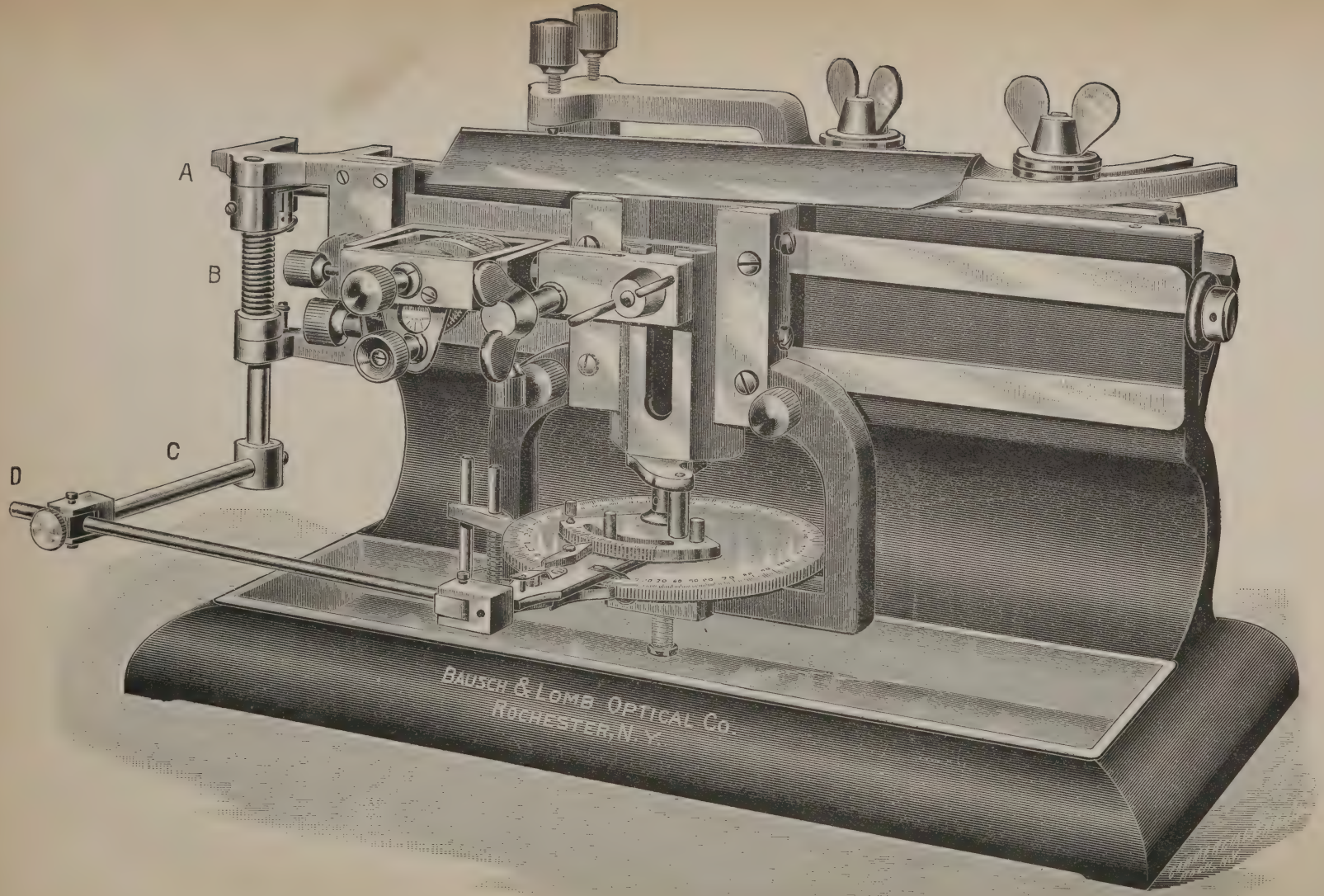
LABORATORY MICROTOME, SMALL SIZE.

No. **2405.**

The dimensions of the Laboratory Microtome, small size, are as follows:

Length of Bed, ... 234 mm.
Height, ... 156 mm.
Vertical Movement of Object by Micrometer Screw, .. 13 mm.
Vertical Adjustment of Object by Clamp, ... 33 mm.
Diameter of Head of Micrometer Screw, ... 78 mm.
Graduations on Head of Micrometer Screw, ... 500
Pitch of Micrometer Screw, ... 0.5 mm.
Finest Degree of Feed, ... 2 micra.
Length of Cutting Edge of Knife, ... 104 mm.

No.		Price.
2405.	**Small Laboratory Microtome,** with Universal Clamp No. 2 (2440), and Knife with 104 millimeter cutting edge,	**$50.00**
2407.	**Polished Cherry Case,** with handle and lock and receptacle for knife case for Small Laboratory Microtome,	**5.00**



No. **2400 F.** (Cut one-half actual size.)

LARGE LABORATORY MICROTOME.

Fitted with Automatic Feed Attachment, Lever Feed and Naples Object Clamp, No. 3, with Mechanical Adjustments, and Knife Support.

No. Price.

2430. Automatic Feed Attachment, - - - - - - **$15.00**

This attachment is applicable only to the large and small Laboratory Microtomes, which are provided with the Lever Feed.

It is readily attachable, as the main frame slips on the V slide of the microtome stand on which the carriage moves, being held firmly in place by the large binding screw as shown in the figure. The feed arm D attaches to the lever arm by simply unscrewing the ivory handle of the lever and substituting the jointed block at its extremity.

In use, the micrometer screw is rotated, elevating the object, by the impact of the knife block (when moved away from the operator, *i. e.*, to place the knife in position to begin the cut) against a movable rod which transmits its motion to the head of the micrometer screw by means of the mechanism shown in the figure.

The knife block being brought forward in cutting the section, the movable bar is relieved of its pressure and is returned to the original position by the action of a spring.

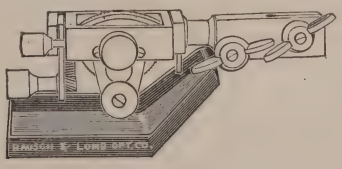
The amount of motion of the micrometer screw is entirely controlled by the lever feed. The automatic feed being readily adjustable to the increased or decreased length of stroke required, either by adjusting the movable rod A or by adjusting the position of D in C by the clamping screw as shown in the figure.

2435. Knife Support, - - - - - - - - - - **6.00**

We recommend the use of this support on the large and small Laboratory Microtomes, as it holds the outer end of the knife in such a manner that there is no spring or bending, even when cutting hard substances, and at the same time the knife may be set at any angle equally as well as without the support, and free manipulation is not in any way interfered with. The support consists of a solid metal arm, of great rigidity, attachable to the knife block by a heavy thumb screw, and to the knife at or near the outer end by a pivoted clamping jaw, perfectly adjustable to any thickness or angle of knife by two thumb screws.

2440. Universal Clamp No. 2, applicable only to the large and small Laboratory Microtomes, - - - - - - - - - - **5.00**

Consists of a heavy rectangular frame rotating on its horizontal axis at right angles to the motion of the knife, and which can be fixed at any desired angle by a convenient thumb screw. This main frame carries a second frame, provided with corrugated jaws, which rotates at right angles to the plane of rotation of the main frame, and which may also be fixed at any desired angle by a thumb screw. It will thus be seen that any object clamped in the object holder can be rotated on its dorso-ventral or anterio-posterior axis, without changing its position in the jaws, and can be immovably fixed in any position by the thumb screws.

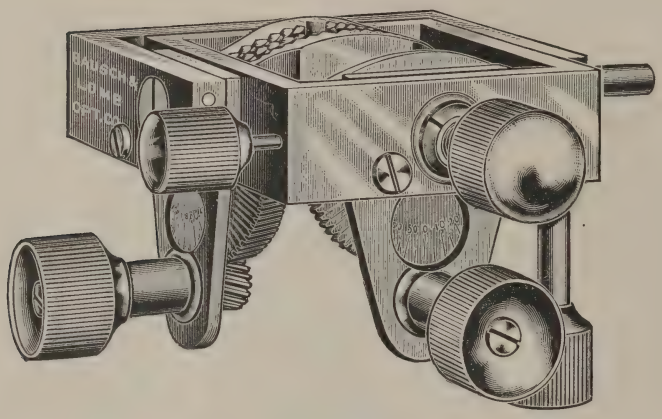


No. 2445.

2445. Drip Pan, attachable to clamps No. 2 or No. 3, - - - - - **2.50**

The pan is of nickeled copper, and is attached to the arm of the clamp in such a way as not to interfere with its minipulation. Alcohol used for irrigating the object is collected in the pan, returned to a suitable vessel and may thus be used over and over again. The pan also protects the feed mechanism from the alcohol which might otherwise drip upon it from the clamp. The pan has outlet and hose for collecting the fluid.

NAPLES CLAMP.



No. **2450.**

NAPLES OBJECT CLAMP.

Applicable to Large or Small Laboratory Microtomes.

No.		Price.
2450.	**Naples Universal Clamp No. 3,** with mechanical adjustments, applicable only to the Large and Small Laboratory Microtomes, - - - -	**$17.00**

This clamp is constructed for the most delicate work and is a combination of the principles of the Naples Zoölogical Station model with special features which increase its convenience and utility. The construction is rigid throughout to permit its use for any kind of microtome work.

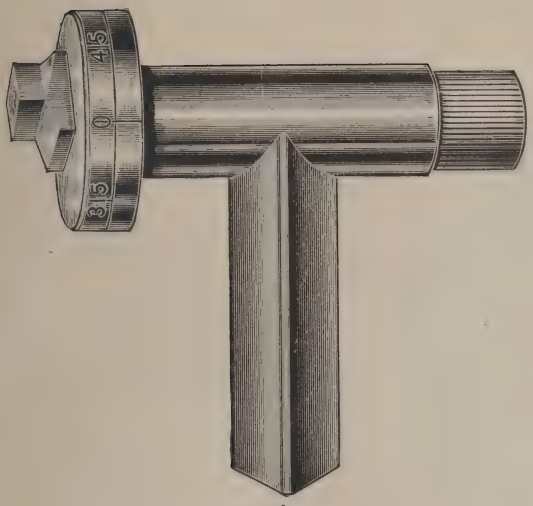
The adjustments are all by diagonal rack and pinion, of the firmest possible construction. Clamping devices are applied for fixing the object immovably in any position. Graduations are provided whereby the amount of rotation given to the object may be read in degrees.

The main frame of the clamp carries a square frame (rotating about an axis in the plane of the knife and parallel to its motion) supporting the axis of the frame carrying the clamping jaws, which axis is at right angles to the motion of the knife.

Rotation about the vertical axis may be secured by means of the Orienting Apparatus described on opposite page.

By means of this clamp the object may be so placed in relation to the knife that sections in any desired plane may be made and the amount of inclination of the sectional plane to the axis of the object recorded.

ORIENTING APPARATUS.



A. B.

No. Price.

2455. **Orienting Apparatus,** complete, for serial sectioning and reconstruction work, **$17.50**

This apparatus consists of six metal object discs (each mounted on an axis), on which the objects to be cut are mounted.

Accompanying the object discs are two holders, A and D, each with a square body perforated to receive the axes of the discs. The holders fit into the rectangular depression in the jaws of the microtome clamp. The object disc rests on the stationary disc of the holder, the circumference of which is graduated 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°, for reading the rotation of the object.

Holder A is mounted with its axis horizontal and with it the block containing the object may be cut on the microtome to an exact rectangular form, giving a true ribbon in serial sectioning, or may be cut to have any number of angles desired for reference lines when drawing or reproducing the cut sections.

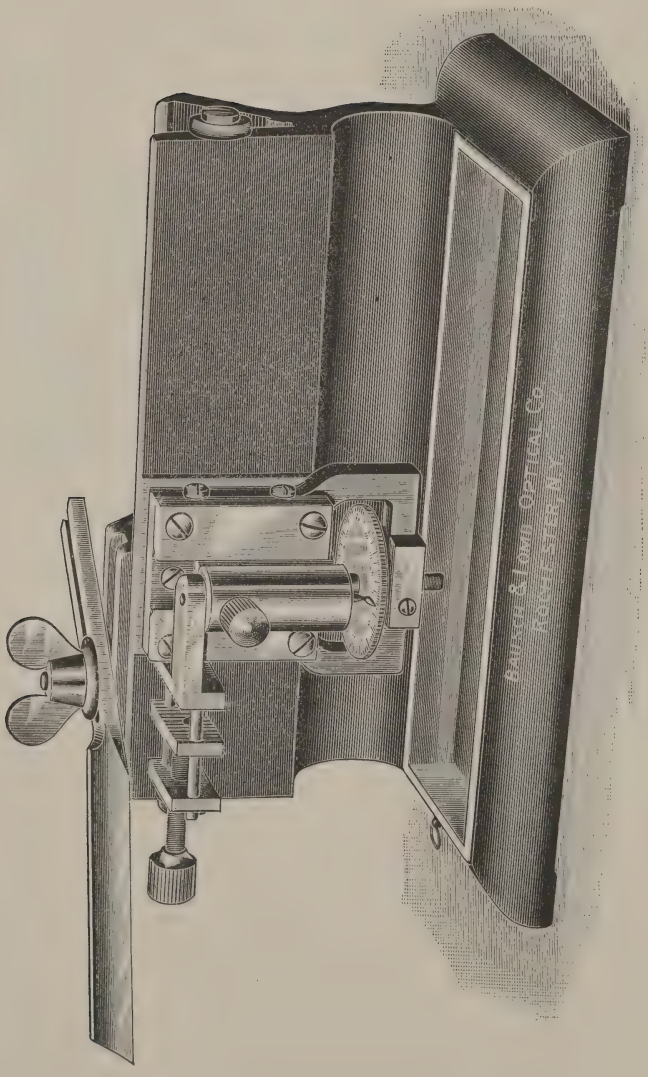
Holder B receives the disc after the block on its surface has been properly shaped in A, and furnishes an easy and accurate means of adjusting the object to the knife by rotation on the vertical axis.

By means of this Orienting Apparatus and the Naples' Clamp, objects can be oriented in any plane or removed from the microtome when partly cut and replaced in exactly the same position as before.

2460. **Holder A,** - - - - - - - - - - **5.00**

2465. **Holder B,** - - - - - - - - - - - **3.50**

2470. **Object Discs,** each, - - - - - - - - - **1.50**



No. **2500.**

(Cut one half actual size.)

STUDENT MICROTOME WITH KNIFE AND SIMPLE CLAMP.

STUDENT MICROTOME.

No. **2500.**

The frame of the Student Microtome is of one **solid casting,** which forms the broad, firm base, the curved arm and the bed in which the knife carrying block slides, thus securing the **maximum** of **rigidity** and at the same time the most convenient form.

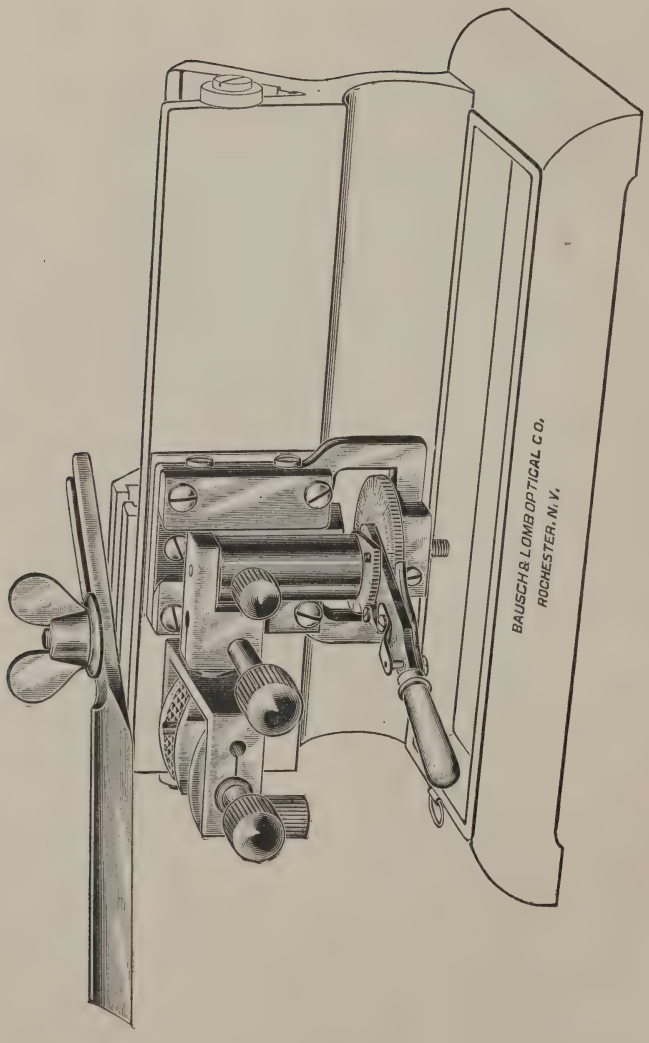
The knife is carried on a solid block, triangular in section, 78 mm. long, which slides on three narrow, perfectly parallel plane surfaces in the V-shaped bed. The knife is held firmly on the block by means of a sliding thumb screw, which works in a **T shaped slot** in the upper surface of the block. This form of block insures a perfectly even motion for the knife, absolute rigidity, and the minimum of friction compatible with these qualities. At the same time, the knife can be set at any desired angle to the object. The unusual length of the block prevents the knife from giving when cutting very hard substances.

The object carrier consists of a strong clamp attached to a slide piece. The clamp has lateral (right and left) and vertical adjustments for bringing the object into proper relation to the knife, the object being held between corrugated metal jaws, which are opened and closed by means of a strong thumb screw.

The slide piece is fitted with the utmost accuracy in the vertical slide so that the object is moved in a plane exactly at right angles to the plane in which the knife moves, and with no liability to give way under the pressure of the knife.

The feed arrangement for bringing the object up to the knife is by an accurately cut steel micrometer screw, the pitch of which is 0.5 mm, acting upon the lower surface of the slide piece. The milled head of this micrometer screw is 45 mm. in diameter, is divided into 100 parts and is provided with a pointer. The micrometer screw works in a block which is provided with an arrangement for taking up any possible wear.

The usual lateral motion and springing of parts in the object carrier is overcome in this instrument by making all the leverages as short as possible, fitting the slide perfectly, and mounting the object carrier and feed screw in a solid stirrup, consisting of one casting, which is joined to the stand of the Microtome, thus relieving the movable parts of unnecessary strain. The base contains a metal pan to catch the drip from the knife.



(Cut one half actual size.)

LEVER FEED AND UNIVERSAL OBJECT CLAMP No. 1, AS APPLIED TO THE STUDENT MICROTOME.

STUDENT MICROTOME AND ACCESSORIES.

The dimensions of the Student Microtome are as follows:

Length of Bed,	208 mm. (8 inches).
Total Height,	130 mm. (5 inches).
Limit of Adjustment of Micrometer Screw,	18 mm. ($\frac{3}{4}$ inch.)
Limit of Vertical Adjustment of Clamp,	26 mm. (1 inch.)
Diameter of Graduated Disk,	45 mm. (2 inch).
Pitch of Screw,	0.5 mm.
Graduations on Head of Micrometer Screw,	100.

No. Price.

2500. Student Microtome, with clamp, as shown on page 122, (without case) with knife of best hand forged steel, 12 cm. cutting edge of blade, in plush lined case, **$20.00**

2510. Universal Clamp, No. 1, applicable to Student Microtome, only, - - **7.00**

This clamp furnishes more readily adjustable object holder than the regular clamp furnished with the Student Microtome. It is adjustable in two planes at right angles to each other and having their axes in the plane of the knife.

The jaws have adjustment of 24 mm.

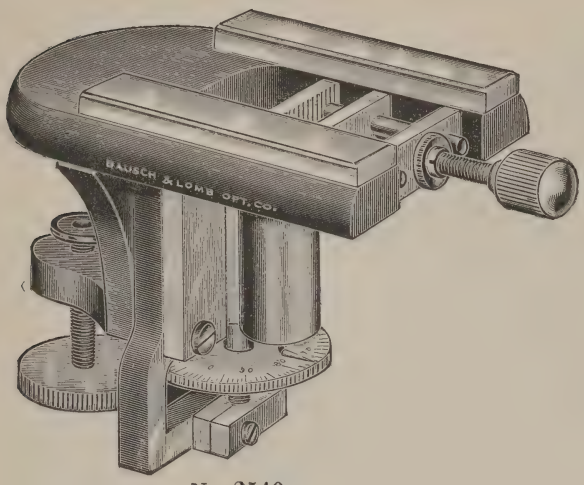
(Shown applied to microtome on opposite page.)

2515. Lever Feed, for Student Microtome, in place of regular feed, - - - **13.50**

This feed is similar in construction to the Lever Feed arrangement, described under Laboratory Microtomes, except that the graduated disc is necessarily smaller to correspond with the smaller stirrup of the Student Microtome. The reduced size of the disc makes it necessary to reduce the number of notches on the margin to 100, each of which has a value of 5 micra., which is the minimum motion of the feed.

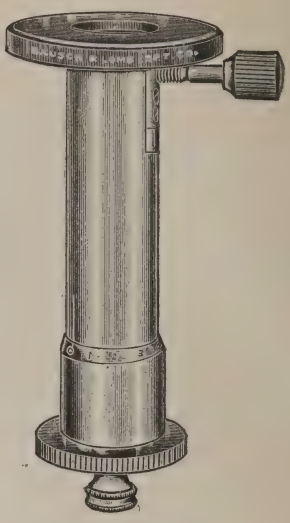
(This feed as attached to the Student Microtome is shown in the figure on opposite page.)

When it is desired to have the Lever Feed attached to a Student Microtome, it is only necessary to send us the stirrup, T slide and micrometer screw. Detach the stirrup from the front of the Microtome by loosening the two screws concealed by the T slide.



No. **2540.**

SIMPLE MICROTOME.



No. **2550.**

HAND MICROTOME.

No.		Price.
2540.	**Simple Microtome,** with clamp to attach to table,	**$12.00**

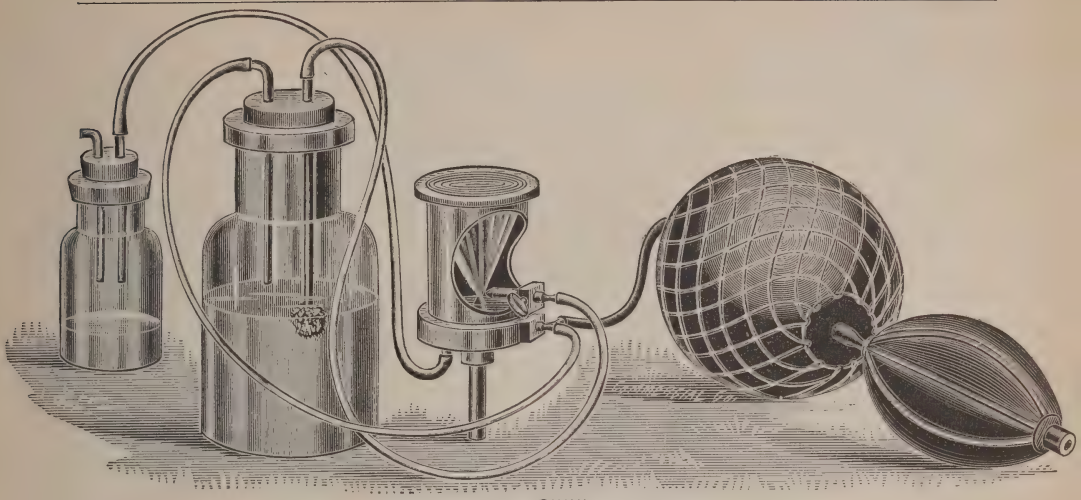
The frame of this microtome is of a single casting, which forms the cutting plate and support for the object holder. Two polished glass plates are attached to the upper surface of the frame and form the guide for the knife. The object clamp has vertical and a limited lateral adjustment, by means of the post attaching the jaws to the slide piece. The feed is by accurate micrometer screw, of 0.5 millimeter pitch, the head being graduated into 100 parts, permitting reading to 0.005 millimeter. The object carrier has vertical movement of 18 millimeter by means of the micrometer screw. This microtome is a very useful one for botanical and histological work, cutting frozen sections, etc.

2545. Simple Microtome, with base, - - - - - - - - **12.00**

This microtome is similar in every way to the simple microtome described above, except that instead of a clamp for attaching to the table, the base of the frame is enlarged to form a broad plate. The instrument thus sets firmly on the table when in use, and can be moved about readily.

2550. Hand Microtome, - - - - - - - - - - **6.00**

Designed by Prof. E. S. Bastin, and in use in the laboratory of the Philadelphia College of Pharmacy, Philadelphia, Pa. This microtome is intended for sectioning vegetable tissues, and will be found especially useful in Botanical and Pharmaceutical laboratories. The microtome consists of a cylindrical body, which is held in the hand, and which contains the clamp for holding the object and the micrometer screw for elevating the object-carrier. A glass disc, mounted for protection in a metal frame, is fastened to the top of the body and forms the cutting plate over which the knife moves. The head of the micrometer screw forms a cap for the lower end of the body cylinder and is graduated to ten parts. As the pitch of the screw is 0.5 mm., the graduations read to 0.05 mm. The micrometer screw is entirely enclosed and protected from injury. The object carrier has a movement of 18 mm. The specimen is firmly fixed in the clamp by a screw with milled head. All the metal parts are nickeled to prevent injury from reagents.



No. **2555.**

No. Price.

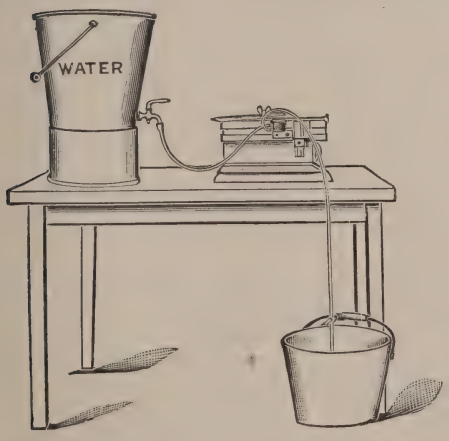
2555. Freezing Attachment, - - - - - - - - - **$10.00**

This attachment consists of nickle-plated cylinder with atomizer, and is fastened on the microtome in the place of the clamp. The object to be frozen is placed upon it. The bottle for fluid is connected on one side with the atomizer, on the other with the pressure regulating bladder and hand bulb. Objects are readily frozen with it, and may be easily kept in this condition. As the fluid collects in the chamber it is drained back into a vial and can be used again. Ether or Rhigolene may be used.

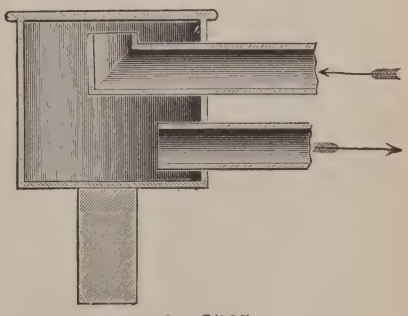
(Adaptable to our Student and Laboratory Microtomes. State when ordering, for which instrument it is intended.)

2560. Foot Bellows, for above Freezing Attachment, - - - - - **5.50**

This bellows may be substituted very conveniently for the hand bulb shown in the figure, and not only permit the free use of both hands, but gives a much stronger current of air which aids greatly in the freezing process, saving time and fluid.



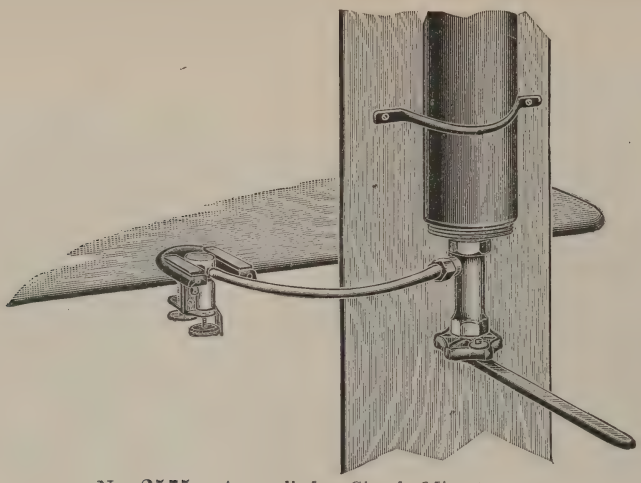
2565 Freezing Chamber attached to Microtome, as used in cutting.



No. **2565.** Freezing Chamber.

2565. Freezing Chamber, for use with ice-water; each, - - - - **2.50**

This Freezing Chamber, and the apparatus for using it, as illustrated above, was devised by Prof. W. J. V. Osterhout, of Brown University, Providence, R. I. A paper water cooler is packed with broken ice and salt and the water allowed to flow through the chamber as indicated by the arrows. The water can be poured back into the cooler at intervals and used over and over again. In ordering, state diameter of opening in the microtome in which the cylindrical standard is to fit, otherwise we will send size to fit our own microtomes.



No. **2575.** As applied to Simple Microtome.

No.		Price.
2575.	**Carbonic Acid Freezing Attachment,** for the Microtome, - - -	**$26.00**
2580.	**Freezing Chamber,** only, - - - - - - - -	**4.75**
2585.	**Cylinder,** filled with CO_2, - - - - - - - -	**19.25**
	Refilling Cylinder, with Carbonic Acid, - - - - -	**4.75**

Wherever the freezing method is desired, this apparatus will commend itself for convenience of operation, rapidity of action, readiness and economy.

Many forms of cell structure both animal and vegetable are demonstrable only by the use of the freezing microtome.

The attachment consists of the following parts:

(1) **A cylinder** 14 cm. in diameter and 115 cm. high, containing liquefied Carbonic Acid, and provided with hood to protect the valve during transportation. These cylinders are the very best made, being tested to a pressure of 3,700 pounds per square inch and provided with a safety attachment in each valve which will relieve the pressure at 2,400 pounds per square inch.

(2) **A metal freezing chamber,** into which the liquid Carbonic Acid is admitted, causing by its expansion any desired temperature down to minus 70° F. This chamber is lined with a non-conducting substance, which prevents absorbtion of heat from the atmosphere, thus increasing the effectiveness of the expanding acid and decreasing the amount required. This chamber is attached to the microtome in place of the usual object-holder.

(3) **A wrench** with screws for attaching it to the valve wheel. This wrench is used to unscrew the bronze cap from the cylinder and to attach a second cap with nipple as described in (4). It also serves as a handle to open the valve permitting the acid to escape into the freezing chamber.

(4) **A bronze cap** with nipple having a very small opening through it. A piece of heavy rubber tubing is also supplied with this nipple, by which the cylinder is connected with the freezing chamber.

(5) **A bracket and two iron straps** with screws, by means of which the cylinder is fastened against the wall or other support.

In use, the cylinder is to be fastened against its support with the valve end down, and should not be placed in the vicinity of a stove or steam pipes.

After removing the hood and bronze cap, attaching the duplicate bronze cap with nipple, and connecting this with the freezing chamber by means of the piece of rubber tubbing, open the cylinder **very carefully** and **slowly** with the lever provided and allow a **very little** of the fluid to flow out into the chamber; continuing the operation only until the object **begins** to freeze.

Under ordinary conditions an object will be frozen in from 10 to 15 seconds.

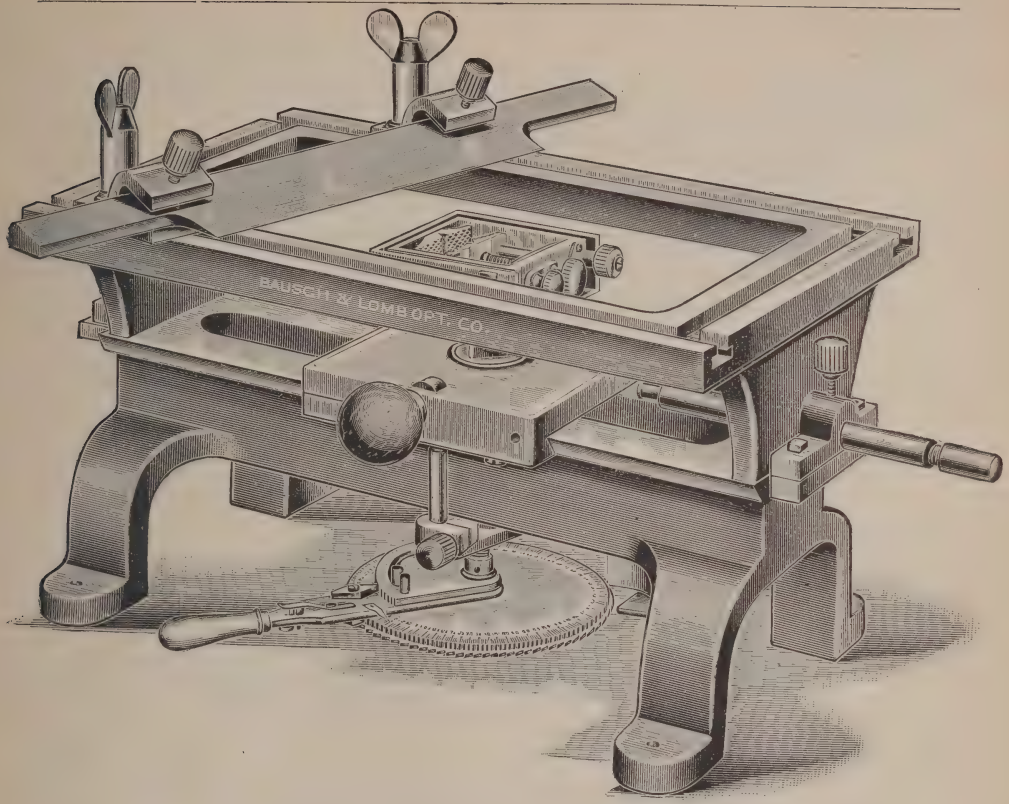
To prevent waste and possible danger of bursting the rubber tube, close the cylinder immediately after the object is frozen. Have the outlet cap about level with the microtome or a trifle lower.

If there is danger of the freezer being operated by unauthorized persons, the lever may be fastened to the valve wheel and this slipped on to the square end of the valve stem and again removed after use.

Directions for Refilling the Cylinder.

Remove the bronze cap with nipple and attach the plain cap. Attach the hood.

Ship the cylinder, accompanied by your order, for refilling, to us by freight. Mark the cylinder empty.



NEW AUTOMATIC MICROTOME.

According to designs by Dr. Charles S. Minot.

This microtome is entirely novel in its construction and works with a degree of precision not attained, we believe, in any previous form. The model adopted has been chosen:

First: To secure the utmost steadiness and precision of movement, together with the minimum of errors.

To this end the knife is rigidly clamped **at both ends** upon a heavy metal frame above the object. The knife can be placed at **any position** or at **any angle** desired.

The object holder is supported **on both sides** directly under the knife in such a manner that the knife exerts **no leverage** upon the object.

Every part is heavily built, and the ways are planed and ground to the greatest possible accuracy.

Second: To secure convenience of use. The micrometer screw bears two toothed wheels, one for **automatic movement,** each tooth equaling five microns, and one for **hand movement** by lever with automatic adjustment, each tooth equaling two microns. The automatic movement is very simple, and can be set to cut any thickness down to five microns. The hand movement feed is fully described on pages 114 and 115. The object holder is **adjustable by rack and pinion** in three planes and has clamping devices for clamping each of the axes; it is adjustable for height also. In all minor details convenience has been carefully secured.

Third: To make a microtome to work **equally well** for either **paraffine** cutting or with **alcohol** (celloidin, etc.).

By a simple device, alcohol falling on the object is drained off without coming in contact with the ways or micrometer screw.

The knife possesses the following advantages, due to the handles being of the same cross-section as the blade:

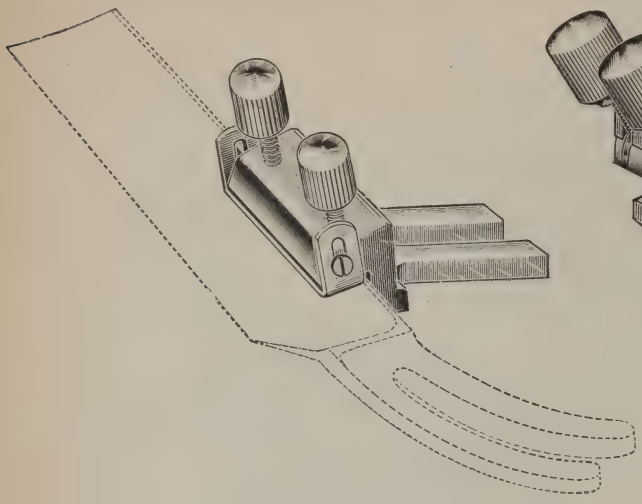
The edge is true, and being made by polishing and not by grinding, is much finer than can be ordinarily produced.

Every part of the edge can be actually used for cutting in the microtome.

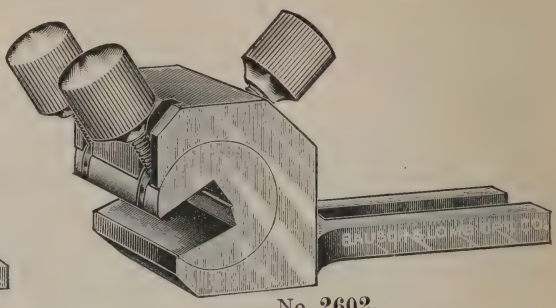
The edge may be kept always perfect by rubbing the blade on a piece of plate glass with Diamatine powder.

The knife is made especially for the New Automatic Microtome, but may also be used with other forms of microtome.

2590. **Minot Automatic Microtome,** complete with knife, - - - **$90.00**
2592. **Polished Case,** with handle and lock extra, - - - - - - **6.00**
2595. **New Microtome Knife,** designed by Dr. Chas. S. Minot, plush lined Morocco case, **15.00**
2597. **Diamantine Powder,** for sharpening knife, per bottle, - - - **.35**
2598. **Plate Glass Tablet,** for sharpening microtome knife, - - - **1.25**



No. 2600.

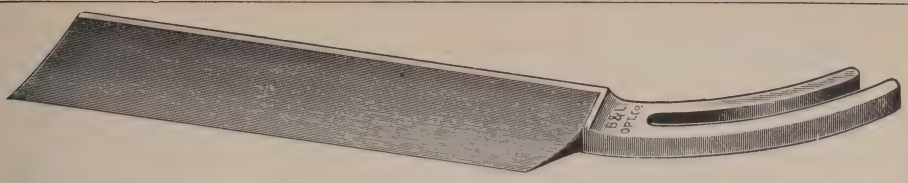


No. 2602.

No.		Price.
2600.	**Knife or Razor Holder,** improved form, applicable to any of our slide microtomes, This attachment is made of brass, nickeled and highly finished; it is very heavy and firm, and holds the knife at the back, thus allowing the use of the entire edge. It has the advantage over the form heretofore used, that it will adjust very readily to the various kinds of knives and microtomes now in use and holds the knife much more firmly.	**$3.00**
2602.	**Knife or Razor Holder,** adjustable, - - - - - - - This knife holder goes to the extreme of solidity and firmness and at the same time furnishes a ready means for fixing the knife at any desired angle of inclination. The holder consists of a solid metal frame, slotted to attach to the knife block by means of the thumb screw, in place of the regular knife. The body of the holder has a cylindrical chamber in which is perfectly fitted a metal cylinder which may be rotated on its axis and which is slotted longitudinally to receive the knife. The knife is held in place by the two binding screws, bearing on its upper surface and is fixed at the desired angle by the heavy set screw at the back of the body. Applicable to either the Large or Small Microtome.	**5.00**

2605.	**Back for Sharpening Microtome Knives,** - - - - - - This back is made from spring steel; it holds the knife at the proper angle on the stone. When ordering, send knife to secure satisfactory fit and angle.	**.50**
2610.	**Section Flattener,** - - - - - - - - - - This is an exceedingly simple and effective device for preventing the curling of thin sections as they are cut. *We must have the knife in order to fit it, however.*	**1.25**

2620.	**Section Knife,** for simple microtome, ebony handle, cutting edge 115 mm., in morocco case, each, - - - - - - - - - -	**3.25**
2625.	**Section Knife,** cutting edge 140 mm., each, - - - - - -	**5.00**



No. Price.

2630. **Section Knife,** for mechanical microtome, cutting edge 85 mm. in plush-lined case, each, - - - - - - - - - - **$3.00**

2635. **Section Knife,** for mechanical microtome, cutting edge 100 mm. in morocco case, each, - - - - - - - - - - **8.00**

2640. **Section Knife,** for mechanical microtome, cutting edge 150 mm. in morocco case, each, - - - - - - - - - - **10.00**

2645. **Same as No. 2640,** but 3 mm. thicker at the back, for cutting hard substances, each, - - - - - - - - - - **10.00**

These knives are made of the very best of English steel. They are *hand forged*, properly tempered, of the very highest attainable quality, and are best suited for work in microtomy. Each knife is thoroughly tested before it is sent out and we guarantee its perfectness.

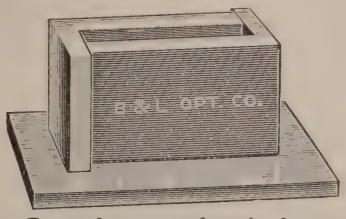
2650. **Section Razor,** best, ⁂, quality, each, - - - - - - **1.10**

This razor is especially constructed for section cutting, being of first class steel, properly tempered, and having one side nearly plane and the other concave. The *cutting edge is perfectly straight*, length of blade 75 mm.

2655. **Section Razor,** good, ⁎, quality, same size and shape as above, each, - - **.75**

2660. **Valentine's Knife,** for making thin sections of soft substances, each, - **6.00**

2662. **Fritche's Knife,** for making thin sections of soft substances, each, - - **6.00**



2665. **Paraffine Imbedding Box,** of type metal, each of two pieces with metal plate.

Height, - - -	10	20	30 mm.
Price, each, - -	**$ .45**	**.45**	**.45**

2690. **Hone, Yellow Belgian,** very best quality, 234 mm. long, 52 mm. wide, set in wooden block with cover, - - - - - - - **3.00**

2695. **Hone, Bluish Green,** imported, 260 mm. long and 52 mm. wide, with rubbing stone, both in wooden block with cover, - - - - - - **.90**

2697. **Palm Oil Soap,** per cake, - - - - - - - **.25**

2700. **Adjustable Leather Strop,** with handle 234 mm. long, 40 mm. wide, - **1.25**

This strop has two surfaces suitable for microtome knives, and a very strong screw for tightening the leather, thus preventing its giving, and rounding the edge of the knife.

2705. **Bow Strop,** 324 mm. long, 60 mm. wide, see Fig. 2, page 132, each, - - **2.00**

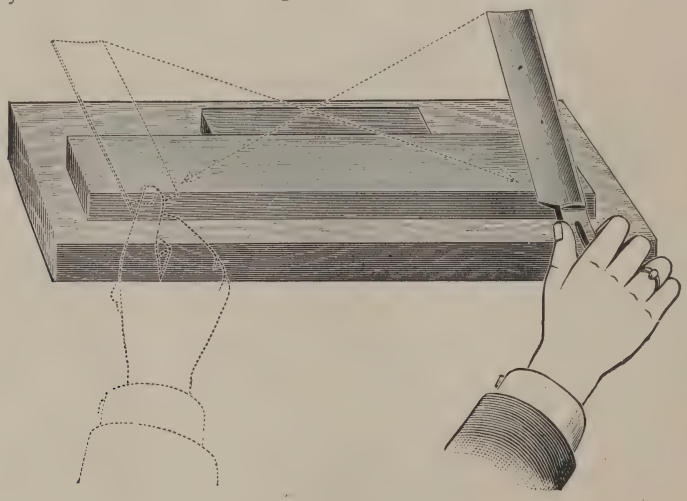
2706. **Block Strop,** solid, fine, each, - - - - - - **1.00**

2707. **Block Strop,** solid, coarse, each, - - - - - - - **1.00**

MICROTOME KNIVES AND THEIR CARE.

The requisites for good work in microtomy are, aside from the manipulative skill in the preparation of the specimen, a perfect working microtome and a good knife. The latter particularly, for, if the cutting edge is not in the best of condition, no good sections can be secured; we have had so many complaints from this source and for the reason that so few know the real *modus operandi* to obtain a keen cutting edge, that we append these instructions how to proceed to sharpen a knife and keep it in good condition.

We recommend to commence with, the yellow Belgian hone for the reason that it is the best obtainable. In using it, cover with palm oil soap and moisten freely with clean water so that a lather will be formed which must be kept during the entire time the knife is being sharpened. This soap has the advantage over the ordinary oils in use for honing in that the pores of the stone remain open,

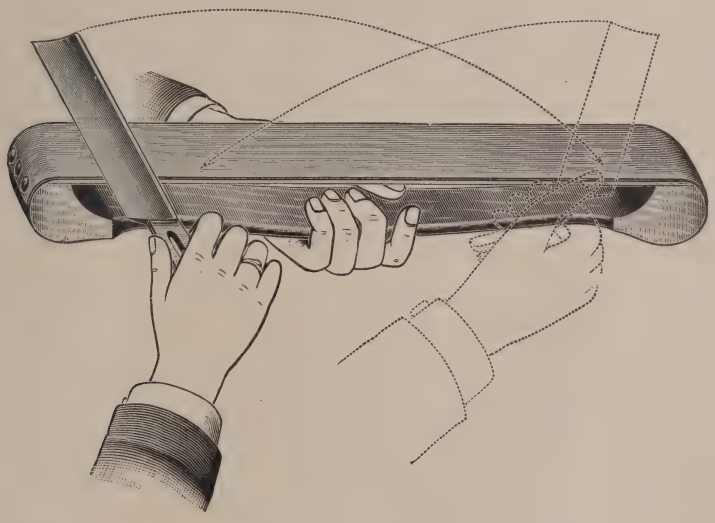


No. **1.**

whereby quicker sharpening as well as a better edge and easier cleaning of the knife are the result. If a microtome knife is very dull or perhaps has small nicks in it, it is very essential to first sharpen it on a yellow stone and then draw it several times over a blue stone in order to obtain an exceedingly keen edge. With the blue stone is used a softer stone called "rubber" which is necessary, for, after the blue stone has been moistened with water, the rubber is used to grind down the stone.

To begin with, the knife is sharpened on the concave side until a fine thread is formed on the cutting edge, which can easily be seen by drawing the knife across the finger nail. When this thread becomes visible along the entire cutting edge, the knife is passed without any pressure over the already prepared stone but in such a manner that the entire edge is always toward the direction in which the knife is moved as shown in cut 1. It is necessary that the mentioned thread be

formed on the concave side only, in order that the amount ground off on the flat side be as little as possible. Should the ground surface on the lower flat side be too large, it will no longer be possible to obtain a perfect cut and the knife must be first of all reground on the flat surface. As soon as the thread appears, the knife is drawn equally to the right and left in the indicated directions, see cut No. 1, without executing the least pressure of the hand on the stone. After a uniform keenness has been obtained by light and continued sharpening its quality can be judged by passing the edge of the knife lightly over the moistened tip of the thumb, and if the feeling that the knife will enter the skin be apparent, it shows that a sufficient keenness has been obtained on the stone and that its perfection can then be only attained by passing it over the strop. The knife is then carefully cleaned with an



No. 2.

old linen cloth held between thumb and index finger, but in such a manner that this cloth does not touch the edge. After cleaning, it is lightly and carefully drawn across the strop with the back of the knife towards the strop and without pressure of the hand, see cut No. 2. If the knife will now cut a hair freely along the entire edge it has attained the requisite keenness of a microtome knife, and after it has again been wiped off with a soft chamois skin it is ready for cutting. It is to be suggested that the strop be slightly covered with oxide of iron and rest on a flat and firm support. We recommend for this purpose our Bow Strop as shown in fig 2. Before each cutting of the preparations the knife should be passed over the strop.

PHOTO-MICROGRAPHY.

Photo-micrographs, and lantern slides from them, have become so much a necessity in biologic work that special and complete apparatus is required in every well equipped laboratory for their production. Any apparatus, whatever its form, in order to be "complete," must embody not only the accessories for producing negatives of the magnified microscopic objects, but must also be conveniently arranged for making lantern slides from these negatives, enlargements of photo-micrographs, where sufficient magnification may not have been practicable in the original negative, and for making copies direct from printed plates, drawings, etc.

In marking out so broad a field for the photo-micrographic camera, we aim to define an instrument suited especially for laboratory use, where the results of individual research are to be transformed into a permanent record and are to be made available for class demonstration. In this field results of immense practical value are easily to be obtained.

The projection microscope is limited in its usefulness to objects of comparatively gross structure, but there are few preparations which may not be shown with the utmost fidelity to detail by means of a properly prepared photo-micrograph or lantern slide.

The apparatus necessary for the work as indicated consists of,—A suitable source of light, The Microscope and The Photographic Camera. As between natural and artificial light, an artificial illuminant is to be preferred, as sun light is not to be had at all times even during the day, and its intensity constantly varies, while the apparatus necessary for its use is even more expensive than that required for artificial light.

Of the artificial lights, the Electric, Wellsbach Gas Lamp and the Oil Light stand in the order named.

Electricity gives the ideal light, but on account of the expense of a suitable lamp, one which will furnish a steady flame that will remain constantly at one point, the Wellsbach Gas light is more often used, its actinic power being very great and the flame also very steady.

While ordinary oil light is excellent in many respects and commends itself for cheapness, its wanting intensity requires much longer exposure than any of the others. This, however, is, perhaps, no drawback to its use except when the camera must be stationed where vibrations of the building are liable to interfere. While much of the best work has been done with the oil light, the tendency now is toward the more powerful and hence more rapid lights.

Any well built microscope stand, which is inclinable to the horizontal position, is adaptable for photo-micrographic work. It should, however, be mounted on a heavy base to insure stability. The fine adjustment screw must move with the utmost freedom and must be free from all lost motion. While not absolutely necessary, a mechanical stage and revolving nosepiece add much to the conveni-

ence and rapidity of work and simplify operations considerably. The microscope should also have a readily adjustable substage, capable of being easily centered to the objective. Our CCDS stand meets all of these requirements.

The Photomicrographic camera differs from the ordinary, chiefly in the increased extent of bellows necessary in order to bring the sensitive plate far enough from the microscope to secure the desired magnification.

There are two principal types — one in which the microscope and apparatus for controlling the light is a part of the camera, and the other in which the camera is entirely separate, the microscope and illuminating accessories being placed on an optical bench, in which case the microscope is connected with the camera by means of a light tight sleeve so constructed that the two instruments do not touch in the slightest degree. This arrangement prevents the possibility of vibrations in one piece of apparatus being transmitted to the other.

In order to make the camera available for the other necessary operations of reducing, enlarging and copying, as well as for photomicrography proper, it is necessary that both the front and back boards be constructed exactly alike so that a plate holder may be used upon either, and that they be provided with vertical and lateral adjustments. With this construction all of the above operations are easily accomplished. It is further necessary to have a wooden section in the middle of the camera, which should be provided with a lens board for carrying an ordinary photographic lens, and having a door opening at the side through which the lens may be introduced and attached in place.

As the Photomicrographic camera requires to be frequently lengthened and shortened, it is necessary that an extremely stable form of sliding base be provided, as well as a delicate adjustable focusing rod whereby the fine adjustment of the microscope may at all times be accurately manipulated from the back of the camera. The most practical focusing rod is that in which a metal tube of half the extension of the camera is made to slide outside of a rod of equal length, the connection between the two being made by means of a pin projecting from the inner surface of the tube into a groove extending the length of the inner rod. A pulley at the end of the focusing rod is connected with the fine adjustment of the microscope by means of cords.

In those cameras where the microscope and illuminating apparatus form a part of the instrument it is necessary to have an eyepiece tube with rectangular prism attached near the microscope to aid in centering the odject on the ground glass screen. The eyepiece tube has cross hairs so arranged that they correspond to the cross lines on the ground glass; thus, when the image of the object is centered with relation to the cross hairs of the eyepiece tube it is also centered on the ground glass. The eyepiece tube, being adjustable, may be moved forward into the path of the light when it is desired to center the image on the ground glass, and withdrawn again, permitting focusing on the screen.

For the best work, the placing of the microscope on an optical bench is unquestionably the most practicable. The camera itself, in this case, is carried on a perfectly firm table, supported by two columns, and having four grooved pulleys upon which the bed of the camera rests. This allows a horizontal movement of the camera so that it may be moved back from the microscope during adjustment of the object and quickly replaced for focusing on the ground glass

and exposure of plate. The optical bench consists of a heavy metal base with columns supporting a table of suitable dimensions for accommodating the necessary accessories. The following are the accessories, named in the usual order of their arrangement on the optical bench. With the Electric Light—Triple Condenser System, Alum Cell, Diaphragm, Ground Glass Screen, Ray Filters, Iris Diaphragm Shutter and Microscope. With the Wellsbach Light, Simple Condensing Lens, Ray Filters, Iris Diaphragm Shutter and Microscope. With the Oil Lamp the arrangement is the same as for the Wellsbach Light.

The proper centering of the illuminating apparatus is of the greatest importance in securing good results and to this end all of the accessories on the optical bench are mounted on separate bases adjustable for height, the bases being movable on a slide in such a manner as to always bring the centers of the various accessories in the same vertical plane. Therefore, the only adjustment required would be such vertical shifting as would make the various centers correspond with the optical axis of the microscope. By this simple arrangement, the relative distances between any of the pieces may be readily varied for the different objectives used, without decentering, or any accessory may be entirely removed, if desired. The first operation in the preparation of the camera for work is the centering of the microscope itself to the camera. This is easily done by removing the eyepiece and objective and placing a diaphragm having a small aperture, in the place of the eyepiece. When the microscope is so arranged that the circle of light projected through the diaphragm is exactly in the center of the ground glass screen, the microscope will be properly centered to the camera. Aside from this centering, it is necessary to center the illuminating apparatus itself, and to properly adjust it to give the best results. It is a primary principle that the image of the source of light must be brought exactly into the plane of the object, when medium or high power objectives are used. By this method, a uniform illumination of the entire image circle is secured, as well as illumination of the special part of the preparation to be photographed and at the same time the full aperture of the illuminating apparatus is utilized. Experience shows that the results are better, the more accurately the image of the source of light is focused on the object. Overheating the object is prevented by inserting a cell filled with distilled water, or a solution of alum, which will absorb the heat rays, between the light and the object. As the image of the flame, formed by the Abbe condenser, alone, is insufficient for best results, a double convex condensing lens, or the compound condenser system, is used to collect a larger number of light rays from the lamp and to project them through the achromatic condenser system.

To facilitate focusing the light, it is best to place a ground glass screen on the microscope stage in the position occupied by the object. The illuminating apparatus is now arranged **so that a perfectly sharp image** of the source of light is **visible** on this **ground glass screen.** After taking away the ground glass, the image of the light will be found to be in the plane of the object. To secure best results, the focus of the condensing lens must fall within the focus of the Abbe condenser. In using the extremely low power objectives, a slightly different method is advisable, i. e.,— the image of the source of light is to be focused upon the front of the objective itself, instead of upon the object. This is easily accomplished by placing a piece of white paper in the position occupied by the front of

the objective, when focused on the object, and (the Abbe condenser being removed) focusing the image of the light sharply upon it by means of the condensing lens.

The majority of objectives in use for ordinary purposes are so constructed that only the red and blue rays of the spectrum are brought together to form the visible image, while the intermediate rays, and those beyond the violet — the most active rays for the ordinary photographic plate — are brought to a focus at another point. It will thus be seen that in order to use these objectives for photomicrography, some means must be devised for eliminating this focus difference. It has been found that by the interposition of a ray filter of such composition as to prevent the passage of light from the violet end of the spectrum, at the same time permitting the free passage of those near the red, the desired result is accomplished, and one may obtain a sharp photographic image in the same plane in which the visual image appears, the visual rays in fact, being the only ones present.

A suitable Ray Filter for photographing bacteria and other objects which have been stained with fuchsin, methyl blue or gentian violet is prepared by dissolving 160 grams of pure Nitrate of Copper and 14 grams pure Chromic Acid in 250 cc. of water. This solution permits light rays of a wave length of from 570 to 550 only to pass and causes the objects stained with the above mentioned solutions to appear black on a green ground. For general work, a Filter made by dissolving 175 grams of Copper Sulphate, 17 grams Bichromate of Potassium and 2 cc. Sulphuric Acid in from 500 to 1,000 cc. of water. The weaker solution being used with the oil light.

The use of these long waved rays for Photography necessitates the use of orthochromatic plates, i. e., — those sensitized for the long wave lengths of light. As such plates are now to be obtained of all the principal makes at the same prices as charged for ordinary dry plates, their exclusive use is recommended.

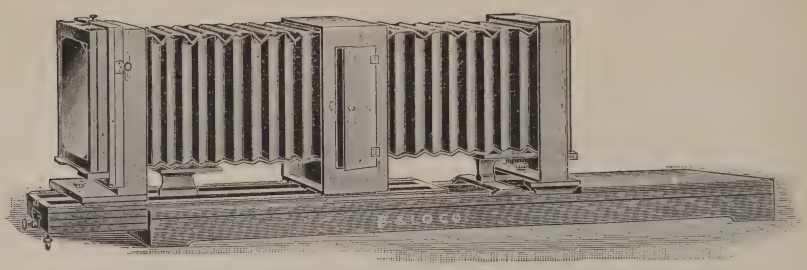
The necessity of using the yellow rays may be obviated by employing only the new apochromatic objectives and compensating eyepieces, which are free from focus difference.

As ordinary objectives are only corrected for a certain tube length, the best results are obtained with them by using an eyepiece. The eyepiece also obviates extreme extension of the camera.

The Iris Diaphragm Shutter offers an extremely convenient means of making the exposures without danger of jarring the camera. It serves at the same time as an iris diaphragm, limiting the cone of light used to illuminate the object.

In conclusion, it must be remembered that much of the success of a photograph depends on the object itself. Sections should be made as thin as possible and should be well stained. The mounts should be free from all foreign bodies. thread like appearances or spots as these, although overlooked by the eye, appear with annoying distinctness on the photographic plate.

The color of the stain also influences the result, black and brown colors photographing best. By the use of proper ray filters and of orthochromatic plates, almost any color may be made to give a good image. It is also to be remembered that better definition is obtained in photographing a colored object when a large aperture of illumination is used.



No. Price.

2800. **"Complete" Photo-micrographic Camera** with one B. & L. Single Plate Holder, 6½ x 8½, and set of kits. Sliding Board for microscope and accessories Lens Board for holding a photographic lens in the central section and fray Rods, **$60.00**

2805. **B. & L. Single Plate Holder** for plates 6½ x 8½ with interchangeable kits down to 3¼ x 4¼, each, - - - - - - - - - - - **6.00**

2810. **Extra Lens Board,** each, - - - - - - - - - **.50**

2815. **Camera Table,** as illustrated and described on page 140, - - - - **15.00**

This camera combines all the essentials for the best photo-micrographic work, with complete arrangements for copying, enlarging, reducing and lantern slide making, being in this respect superior to any other photo-micrographic camera on the market.

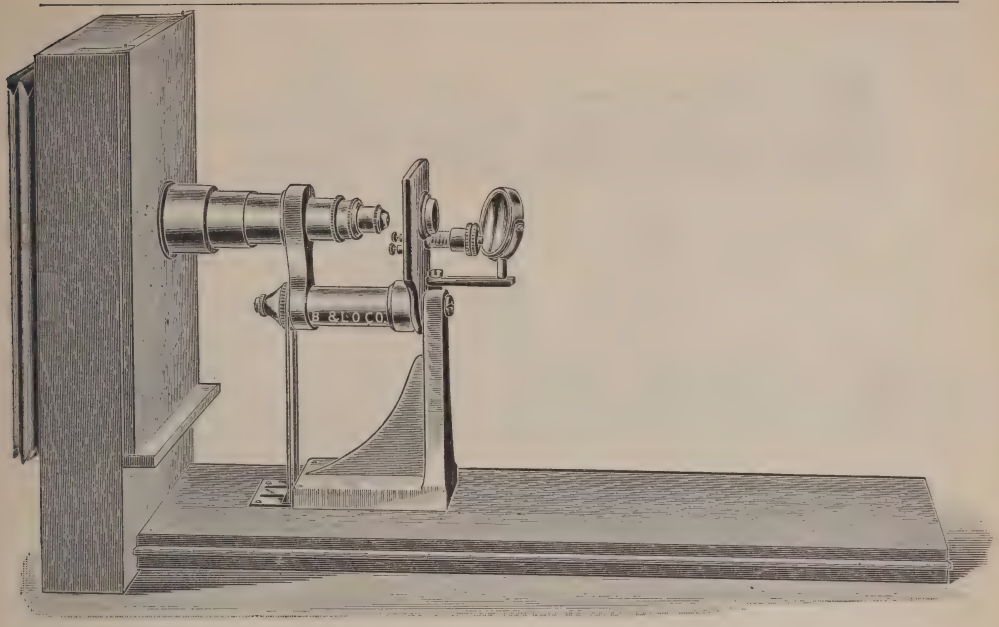
Specifications, size of plates 6½ x 8½ down to 3¼ x 4¼. Extension of bellows, 7½ feet. Woodwork of cherry, highly finished. Bellows of leather, best quality with reinforced corners. Front Board and Back Board arranged for receiving Plate Holders, or Plate Holder Kits without plate holder, Lens Board or Board with light tight chamber; and having lateral and vertical adjustments for centering the ground glass or negative to the image or plate.

Bellows with central section of wood, having Lens Board and side door so that a photographic lens may be used for copying, enlarging, reducing or lantern slide work. Plate holder kits also fit in the section in place of lens board. Base of camera in two sections, the rear section sliding in groove in forward section in such a manner as to secure rigidity and at the same time permit easy and rapid adjustment. Focusing rod located medially beneath the camera base and consisting of a metal tube of the length of the rear section and sliding outside of a solid metal rod, having a groove extending its entire length. The outer tube connects with the rod by means of a metal pin, projecting from its inner surface into the groove of the rod. The focusing rod is thus capable of the same extension and contraction as the camera itself without in any way interfering with its delicacy of movement. Sliding supports are provided to prevent sagging of the bellows when the camera is extended. The front of the camera is arranged to receive sliding board for the microscope attachment or Rafter attachment as described on following pages.

The front, back and middle sections are adjustable on the base so that the camera may be made to occupy any desired position.

The base is also arranged to fit the camera table, if ordered with table.

The B. & L. Single Plate Holders are so constructed that the sensitive plate is brought in exact coincidence with the plane of the ground glass. Kits are furished for using plates of 6½ x 8½, 4¼ x 6½, 4 x 5 and 3¼ x 4¼ sizes. The kits are so arranged that they fit either front or back board or the middle section to hold negative or plate for enlarging, reducing or lantern slide work. The focusing screen is of fine ground glass, having a transparent central area for finest focusing and with cross lines for centering the image.



No.		Price.
2820.	**Microscope attachment** for complete Photo-micrographic Camera, - -	**$30.00**
2830.	**Abbe Condenser with Iris Diaphragm, N. A.** 1.42, - - -	**13.00**
2835.	**Achromatic Abbe Condenser N. A.** 1.00, with iris diaphragm fitted between the combinations, - - - - - - - - -	**26.00**
2840.	**Support for Ray Filters,** containing two glass cells for holding the filtering fluid and adjustable for height, - - - - - -	**7.50**
2845.	**Bi-Convex Condensing Lens,** 4 in. diameter on support adjustable for height,	**6.00**
2850.	**Wellsbach Lamp** with metal chimney, - - - - -	**8.00**

The microscope attachment consists of the microscope, as shown in the illustration (the front of camera and base board shown are not a part of the apparatus).

The base of the microscope is so formed that the body of the instrument is brought exactly in a horizontal position, the stage being vertical and perfectly rigid.

The fine adjustment is by delicate micrometer screw, acting on the triangular bearing of the arm. The milled head of the screw is silvered and graduated and is grooved to receive the band connecting it with the focusing rod.

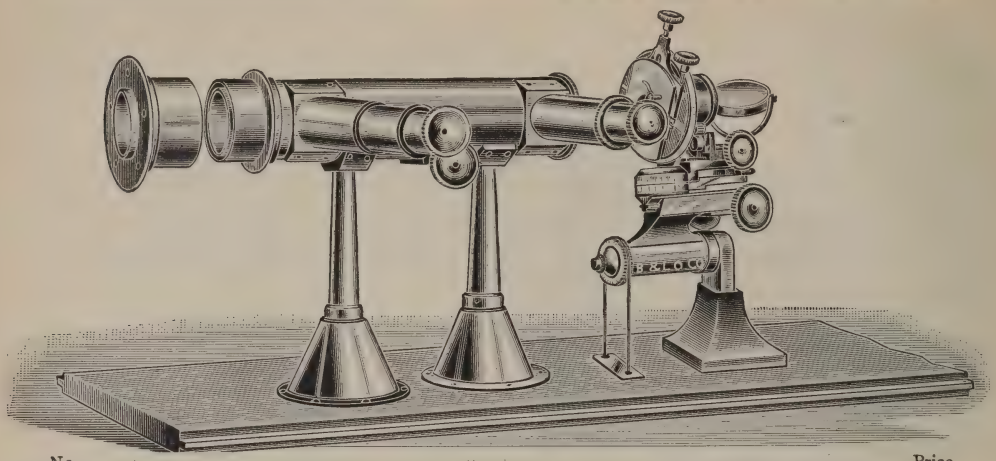
Coarse adjustment is by sliding tube.

The stage has a sliding object carrier, moving upon a glass surface, permitting ready adjustment of the object. The object carrier can be removed when desired and the slides held on the stage with spring clips.

The substage consists of a substage ring mounted on a frame by means of three binding screws, moving in slots, thus permitting the ring to be centered to the objective.

The substage has mechanical movement by means of quick acting screw permitting rapid and accurate focusing of the condenser. The substage may be thrown entirely out of the optical axis when desired. A mirror for focusing or for use with indirect sunlight is also provided.

The microscope attachment is brought in connection with the camera by means of a light tight sleeve in such a manner that while all light is excluded, the microscope attachment does not come in contact with the camera.



No.		Price.
2860.	**Rafter's Attachment** with mechanical stage, for the Complete Photo-micrographic Camera,	**$165.00**
2862.	**Rafter's Attachment** but with plain revolving stage,	**130.00**
2865.	**Achromatic Amplifier,**	**6.50**
2870.	**Support for Ray Filters,** containing two glass cells for holding the filtering fluid and adjustable for height,	**7.50**
2875.	**Biconvex Condensing Lens,** 4 inches diameter on support adjustable for height,	**6.00**
2880.	**Wellsbach Lamp,** with metal chimney and Iris Diaphragm, on base,	**12.00**

This is a very convenient and stable optical equipment for photomicrography and is so arranged as to permit the ready use of the Achromatic Amplifier, as well as eyepieces for the projection of the image.

It consists of a large horizontal metal body, mounted on two massive metal columns, insuring perfect stability. The front of the body has Society screw, and to this the objective is attached. Within the main body the tube for the amplifier or eyepiece is adjustable by rack and pinion. The back of the body connects with the camera by means of a light tight sleeve, as shown in the illustration, and which is so arranged that while all light is excluded, the body does not come in contact with the camera.

For centering the object and for finding suitable field, two lateral tubes are attached to the main tube, into either of which a rectangular eyepiece tube, supplied with the attachment, may be slipped. The rectangular eyepiece has cross hairs corresponding with the cross lines on the ground glass of the camera, so that when an object is seen centered to the cross hairs of the eyepiece, it will also be centered on the ground glass. The front tube is used with the objective only and the back tube when the amplifier or an eyepiece is used, the unused tube being always closed by a cap furnished for that purpose.

The object is carried on a special microscope, consisting of a heavy metal base, supporting the mechanical stage, substage and adjustments, and so arranged as to at all times maintain the stage at exact right angles to the optical axis.

The fine adjustment is by delicate micrometer screw of greatest accuracy, acting on the triangular bearing of the arm and having silvered and graduated milled head with grooved circumference to receive the band connecting with the fine adjustment rod. The course adjustment is by diagonal rack and pinion.

The substage is also adjustable by rack and pinion and has centering arrangement whereby the condenser may be centered to the objective. The stage is our revolving mechanical stage No. 1570.

The Achromatic Abbe Condenser with iris diaphragm fitted between the combinations, is a part of the Rafter attachment. The base board upon which the attachment is mounted, is of sufficient extent to permit the convenient placing of ray filters, condensing lens and lamp.

No.		Price.
2885.	**Support with two glass cells for Ray Filters,** on circular base, with means for vertical adjustment,	**$7.50**
2887.	**Ground Glass Screen,** on base, adjustable for height,	**4.00**
2890.	**Revolving Diaphragms** on circular base with means for vertical adjustment,	**4.00**
2895.	**Bi-convex Condensing Lens,** 100 mm. diameter, on circular base, with means for vertical adjustment,	**6.00**
2896.	**Triple Condenser System,** on circular base, adjustable for height,	**30.00**
2900.	**Alum Cell,** on circular base, with means for vertical adjustment,	**8.00**
2902.	**Iris Diaphragm Shutter,** on base adjustable for height,	**21.00**
2904.	**Rectangular Eyepiece,** in tube with body for attaching between the microscope and camera,	**10.00**
2905.	**Oil Lamp,** on support adjustable for height,	**5.00**
2910.	**Wellsbach Gas Lamp,** with Metal Chimney and Iris Diaphragm, on circular base with means for vertical adjustment,	**12.00**

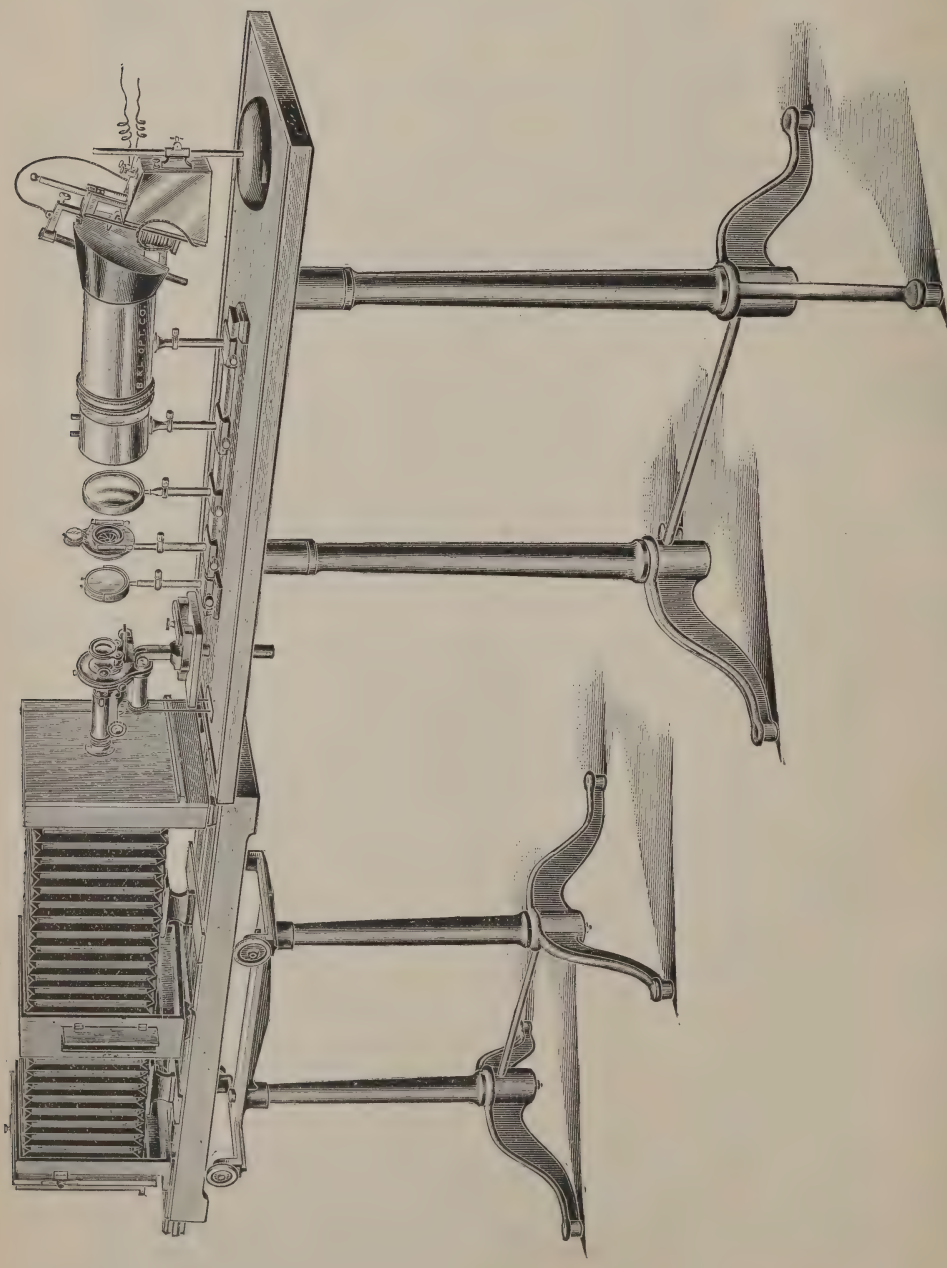
This Lamp is especially arranged for Photo-micrography; the aperture in the Chimney has Iris Diaphragm, by means of which the amount of light passing through the illuminating apparatus can be accurately controlled, and which also permits the use of that portion of the flame having the most uniform intensity.

2915.	**Extra Mantle,** for Wellsbach Lamp, each,	**.85**
2920.	**Automatic Electric Lamp** on base adjustable for height,	**70.00**

This Lamp embodies those essential features of a light for Photo Micrography —a steady flame of uniform intensity remaining perfectly centered. The flame is maintained at one point by automatic device which moves both the negative and the positive carbons. The lamp is very compact, is perfectly insulated so that there is no danger in handling it, even with the current turned on, and it is provided with vertical and lateral adjustments for centering the flame. It may be used on any continuous circuit, either arc or incandescent. (We can also furnish a lamp for the alternating current if desired.) With currents of low tension, it is desirable to employ the adjustable Rheostat in connection with the lamp, as by this means, any desired intensity of illumination may be obtained.

2925.	**Adjustable German Silver Rheostat,**	**24.00**
2930.	**Fixed German Silver Rheostat,**	**12.00**
2935.	**Carbons,** per doz.,	**.60**
2940.	**Focusing Glass,**	**2.00**

This is an indispensable accessory to photo-micrographic work and consists of a magnifying glass, having a large and flat field, mounted in a tube of about its own focal length. The lens is also adjustable in the tube. By this construction all light except that coming from the object is excluded from the eye, and it is possible to obtain a much sharper focus than in any other manner. In use, the tube of the focusing glass is placed in contact with the ground glass of the camera and the image inspected over the entire area. Each person should, before trying to focus with the focusing glass, adjust the lens so that when the tube is placed against a transparent plate, objects on its surface will be sharply in focus.



COMPLETE PHOTO-MICROGRAPHIC CAMERA, CAMERA TABLE AND OPTICAL BENCH.

No. Price.

2950. Optical Bench, complete, with the following accessories on supports adjustable for height, Automatic Electric Arc Light (for continuous circuit, either arc or incandescent). Three Lens Condensing System, Alum Cell, Bi-convex Condensing Lens, Two Ray Filter Cells on Support. Iris Diaphragm Shutter on Support, and Revolving Diaphragms on Support, price, - - - - - **$160.00**

2952. Optical Bench, complete, with the following accessories on supports adjustable for height, Wellsbach light with metal chimney and Iris Diaphragm, Bi convex Condensing Lens, Alum Cell, Support with two Glass Cells for Ray Filter and Iris Diaphragm Shutter, - - - - - - - - - - **70.00**

2954. Optical Bench, complete, with the following accessories on supports adjustable for height. Oil Light, Bi-convex Condensing Lens Revolving Diaphragms and Support with two Glass Cells for Ray Filters, - - - - - - **38.00**

The Optical Bench consists of a highly finished hardwood table, supported on two massive columns in such a manner as to secure the utmost stability. The optical accessories are mounted on supports which are adjustable for height, enabling them to be quickly and easily centered to the optical axis of the microscope.

The bases of all the accessories are arranged to slide on a broad metal V piece, upon which they may be fixed at any point by a screw clamp. This arrangement secures perfect alignment of all accessories in the same vertical plane.

The lamp, Electric, Wellsbach or Oil as the case may be, is carried on a separate standard.

The microscope is held in position on an adjustable base to which it is firmly clamped.

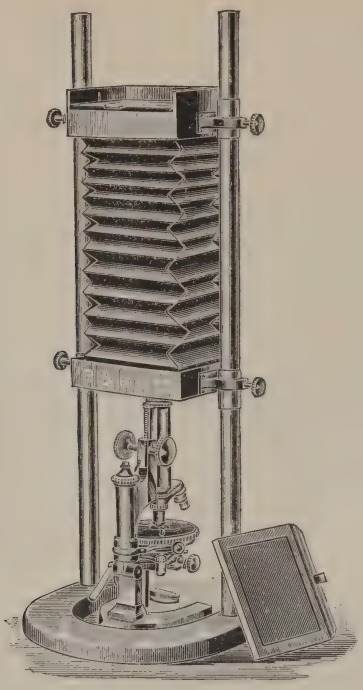
The triple condensing system consists of a double combination of condensing lenses, 100 mm. in diameter, in combination with a meniscus lens of the same diameter, mounted in adjustable mounting. This form of condenser not only gives a more nearly achromatic image of the source of light, with less spherical distortion, but also enables the focus of the condensing system to be readily changed.

The Ray Filters are each formed of two perfectly ground and polished plane glasses, between which is cemented a glass ring, having two perforations, through which the cell may be filled, emptied or cleaned. With this convenient construction of the Ray Filter it is possible to use any variety of solutions for the absorption of light rays. The cells are furnished without solution, unless otherwise ordered, when a nominal charge will be made for the solutions used.

The Iris Diaphragm Shutter not only serves as an iris diaphragm for controlling the aperture of the pencil of light illuminating the object, but gives a perfect exposure of the plate without the slightest danger of jarring the apparatus. Exposures of from $\frac{1}{100}$ to 3 seconds are made automatically by a simple pressure of the pneumatic bulb. The shutter may also be operated by the pneumatic release for any desired exposure longer than 3 seconds.

2955. Camera Table, - - - - - - - - - **15.00**

The construction of the Camera Table is shown in the figure on page 140; the object of this table is to furnish a perfectly stable support of the most convenient height and form for manipulation of the camera, and to provide an easy means of adjusting the camera to the optical bench. The Camera Table is of iron throughout, neatly japanned. The camera rests upon the four grooved pulleys and there is a special device for rigidly clamping it at any point on the table.



No.		Price.
2960.	**Vertical Photo-micrographic Camera** (without microscope), with one double plate holder for 4 x 5 plates and with kits for 3¼ x 4¼ plate, - - -	**$40.00**
2965.	**Extra Double Plate Holders,** each, - - - - - -	**1.25**
2970.	**Extra Kits,** for 3¼ x 4¼ plates, each, - - - - - -	**.35**

To meet the demand for a Vertical Photo-Micrographic Camera at a moderate price, we have designed the one illustrated, which is substantially finished throughout. The base is of horseshoe type, made of large size (27½ x 28½ cm.) to insure perfect stability, and is of japanned iron. The support bars are made of steel, 2½ cm. in diameter and 1 m. long, on which the camera moves vertically and on which it can be fixed by milled head clamps. The lower right and left milled head clamps rigidly support the lower part of the camera, overcoming entirely any undue action on the fine adjustment, as the microscope is entirely free from the weight of the camera. The ground glass can be brought exactly at right angles to the optic axis by means of graduations on the vertical bars. The graduations will serve further in calculating magnification. The bars are 25 cm. apart, giving sufficient space for the head when adjusting the object to the microscope. The bellows is 50½ cm. long, mounted in highly polished mahogany, and is connected to the microscope by means of a light, tight, double metal chamber, blackened inside and out to prevent reflection, and which effectually prevents entrance of any rays of light. In making this connection with the chamber, the camera does not come in contact with the microscope tube. The camera and microscope are entirely separate, and rest on their respective bases. Size of plate 4 x 5 or 4¼ x 3¼ inches.

PHOTO-MICROGRAPHIC MATERIALS.

DRY PLATES.

No.	Size.	Make.	Per Dozen.
3001.	3¼ x 4¼,	Eastman,	**$ .60**
3002.	4 x 5 ,	"	**.80**
3003.	4¼ x 5½,	"	**1.00**
3004.	6½ x 8½,	"	**2.00**
3005.	3¼ x 4¼,	Seed,	**.60**
3006.	4 x 5 ,	"	**.80**
3007.	4¼ x 5½,	"	**1.00**
3008.	6½ x 8½,	"	**2.00**
3009.	3¼ x 4¼,	Carbutt or Forbes Orthochromatic,	**.60**
3010.	4 x 5 ,	" " "	**.80**
3011.	4¼ x 5½,	" " "	**1.00**
3012.	6½ x 8½,	" " "	**2.00**
3013.	3¼ x 4¼,	Eastman Bromide Lantern Slide,	**.60**
3014.	3¼ x 4¼,	" " " " Extra Thin,	**1.20**

PHOTOGRAPHIC PAPER.

GELATINO-CHLORIDE.

	Name.	Size.	Per Dozen.	Per Gross.
3015.	Eastman's Solio,	3¼ x 4¼,	**$ .25**	**$2.10**
3016.	" "	4 x 5 ,	**.30**	**2.60**
3017.	" "	4¼ x 5½,	**.30**	**2.60**
3018.	" "	6½ x 8½,	**.85**	**8.00**
3019.	" "	4 x 5 , Seconds **$1.00** per hundred.		
3020.	" Karsak,	3¼ x 4¼,	**.25**	**1.60**
3021.	" "	4 x 5 ,	**.30**	**2.00**
3022.	" "	6½ x 8½,	**.75**	**5.40**
3023.	" "	3⅞ x 5½, Seconds **$1.20** per gross.		

ARISTO.

			Per Dozen.	Per Gross.
3024.	"	Western Collodion, 3¼ x 4¼,	**$ .25**	**2.10**
3025.	"	" " 4 x 5 ,	**.30**	**2.60**
3026.	"	" " 4¼ x 5½,	**.30**	**2.60**
3027.	"	" " 6½ x 8½,	**.85**	**8.00**

BROMIDE.

			Per Dozen.
3028.	"	Permanent Bromide (AB or C quality), 3¼ x 4¼,	**$ .30**
3029.	"	" " " " 4 x 5 ,	**.50**
3030.	"	" " " " 4¼ x 5½,	**.65**
3031.	"	" " " " 6½ x 8½,	**1.50**
3032.	"	Enameled, " " " (Prices same as for Permanent Bromide.)	
3033.	"	Platino, " " " (Prices same as for Permanent Bromide.)	
3034.	"	Eureka, " " " No. 1, 3¼ x 4¼,	**.20**
3035.	"	" " " " " 4 x 5 ,	**.30**
3036.	"	" " " " " 4¼ x 5½,	**.40**
3037.	"	" " " " " 6½ x 8½,	**.85**
3038.	"	Eureka, Enameled, Bromide (AB or C quality), Thin (Prices same as for No. 1.)	
3039.	Blue Print Paper,	3¼ x 4¼,	**.25**
3040.	" " "	4 x 5 ,	**.25**
3041.	" " "	4¼ x 6½,	**.40**
3042.	" " "	6½ x 8½,	**.60**

PHOTOGRAPHIC REAGENTS.

No.		Price.
3043.	Bromide of Ammonia, per oz.,	$ .75
3044.	Bicarbonate of Soda, per oz.,	.05
3045.	Acetate Soda, 2 oz. bottle,	.20
3046.	Bromide Potassium, per oz.,	.15
3047.	Carbonate of Soda, per lb.,	.15
3048.	Carbonate of Potash, per lb.,	.25
3049.	Citric Acid, 4 oz. bottle,	.30
3050.	Eikonogen, per oz.,	.60
3051.	Eikonogen Developing Powders, Pkg. of 12 for 48 oz. developer,	.60
3052.	Gold Chloride, 1 gram vial,	.80
3053.	Hydrochinon, per oz.,	.60
3054.	Hyposulphite of Soda, pound box,	.10
3055.	Hyposulphite of Soda, 5 lb. box,	.40
3056.	Intensifier, per 8 oz. bottle,	.50
3057.	Metol, per oz.,	1.20
3058.	Oxalate of Potash, per lb.,	.40
3059.	Pyrogallic Acid, per oz.,	.60
3060.	Pyro Powders, per Pkg. of 12 for 48 oz. developer,	.60
3061.	Solio Toning and Fixing Solution, per 8 oz. bottle,	.65
	This solution tones and fixes the Solio or Karsak Paper at one operation, rendering silver printing almost as simple as the making of a blue print.	
3062.	Sulphite of Soda, per lb.,	.25
3063.	Sulpho-cynide of Ammonia, per oz.,	.20
3064.	Tungstate of Soda, per oz.,	.15
3065.	Proto Sulphate of Iron, per lb.,	.40

DEVELOPING TRAYS.

FOR DEVELOPING, FIXING OR TONING.

			Shallow.	Deep.
3066.	Hard Rubber,	4 x 5, each,	$ .40	.65
3067.	" "	5 x 8, each,	.75	.90
3068.	" "	6½ x 8½, each,	1.00	1.20
3069.	" "	8 x 10, each,	1.50	1.60
3070.	Papier Maché,	4 x 5, each,	$ .40	
3071.	" "	5 x 8, each,	.75	
3072.	" "	6½ x 8½, each,	1.00	
3073.	" "	8 x 10, each,	1.35	

DARK ROOM LANTERNS.

3074.	Ideal, large, with reflector and eyeshade, 3 sides glass. May be used for making transparencies or printing on Bromide Paper,	4.00
3075.	Universal, No. 2, with one ruby pane, eye shade and hinge back,	1.35

MISCELLANEOUS ACCESSORIES.

3076.	Ferrotype Plates, 10 x 14 inches, each,	.15
	When it is not desired to burnish prints, they may be squeeged on these plates, giving an equally polished surface.	
	Squeegees and Print Roller, for mounting prints on cards or squeegeeing on Ferrotype Plates,	
3080.	With 6 inch roll,	1.35
3081.	With 12 inch roll,	2.00
3082.	Cream Paste, for mounting prints, ¼ pint, **25** cents; ½ pint, **30** cents.	
	Negative Envelopes of strong manilla paper,	
3083.	3¼ x 4¼, per package of 50,	.25
3084.	4 x 5, " "	.25
3085.	4¼ x 6½, " "	.30
3086.	6½ x 8½, " "	.45

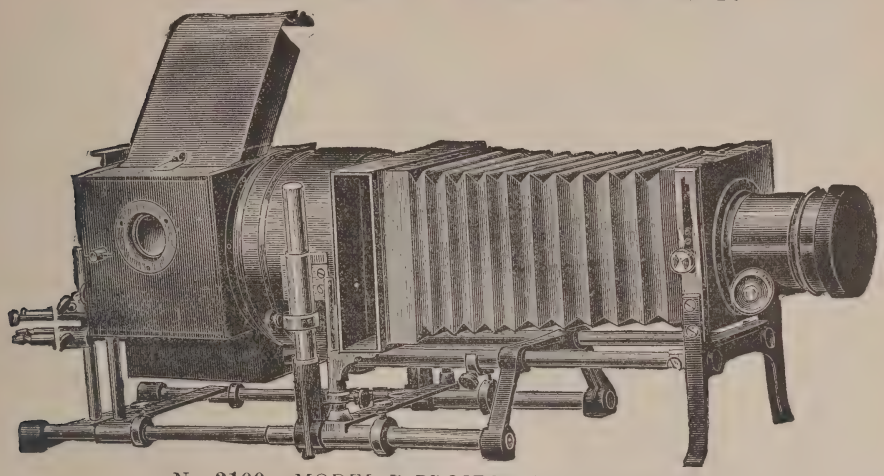
CARD MOUNTS.

	Unenameled back and face, assorted colors,	
3087.	4 x 5, per package of 2 dozen,	.30
3088.	4¼ x 6½, " "	.45
3089.	6½ x 8½, " "	1.00

LANTERN SLIDE MOUNTS.

3090.	Gummed Black Binding Strips, round or square opening, **25** cents per 100.
3091.	Slide Mats, square or oblong opening (the latter horizontal or vertical), **30** cents per package of 25.

PROJECTION APPARATUS.



No. **3100.**—MODEL B PROJECTION APPARATUS.

This Projection Apparatus we believe to be the best adapted to general work of any now on the market, it being quickly and easily adjustable, light, and at the same time firm and of stable construction.

The optical parts are all carried on a frame work, consisting of parallel bars joined by suitable support, thus securing coincidence of the optical centers and at the same time permitting perfect freedom for adjustment.

The Projection Objective is mounted on an adjustable front board which may be raised or lowered and fixed at any point. It is connected with the slide box by means of an adjustable bellows hood which permits the adjustment of the slide to the objective as necessitated by the different powers of the lenses used, or varying lengths of rooms. The bellows is easily detached, if desired.

The Condensing Lenses, consisting of a pair of powerful plano convex lenses 4½ inches diameter, mounted with special reference to preserving them against changes in temperature to which they are subjected, are carried in a moveable ring back of the slide box, the mounting being provided with a flange into which the ring of the lamp hood slips, thus forming a light proof chamber between the lamp and the objective. The condensers may be vertically adjusted on supporting rods shown in the figure.

The back of the stereopticon frame is so arranged that any desired form of lamp may be attached. The Oil, Wellsbach, Lime or Electric lights being equally applicable.

When it is desired to use the apparatus for projection of microscopic objects, the Projection Objective and its supporting rods, the bellows and the slide box, may be removed to be replaced by the optical bench described on page 149.

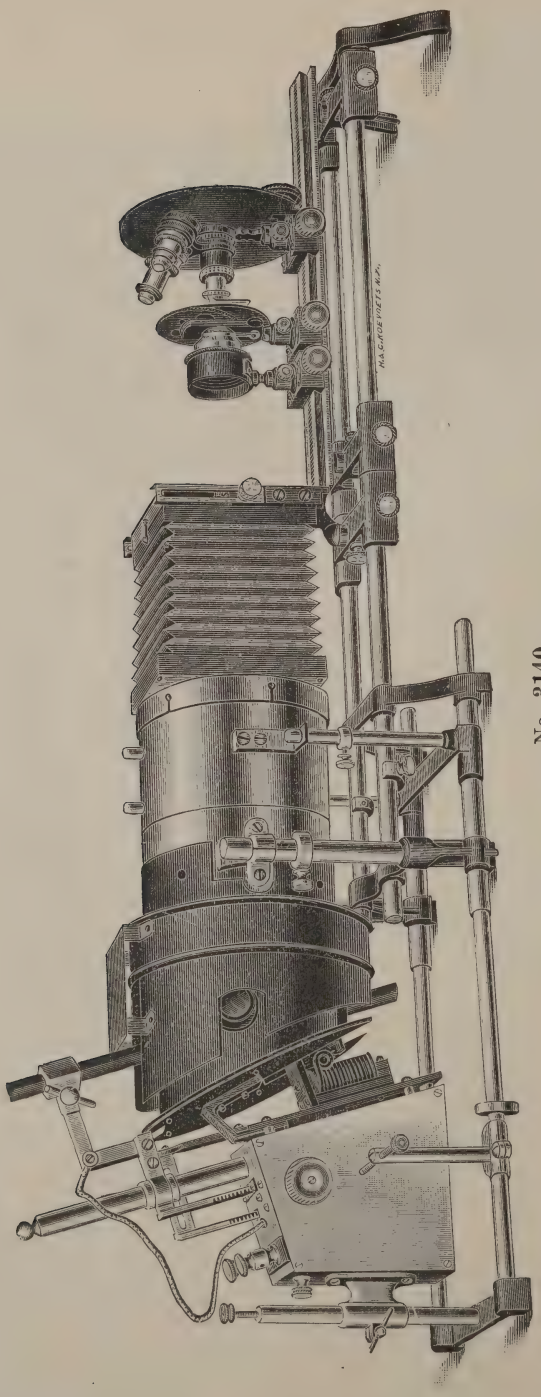
All of the changes and adjustments may be made without the aid of tools. The parts are all interchangeable, hence, readily duplicated.

If, after purchasing this lantern, double or triple lanterns are desired, they they may be added without extra changes being necessitated.

When ordering parts, state that they are to be for Model B.

No.		Price.
3100.	**Model B Projection Apparatus,** as shown in cut, with Lime Light and with ¼ plate objective,	**$80.00**
3105.	**Model B Projection Apparatus,** with Reservoir Oil Lamp and ¼ plate projection objective,	**80.00**
3110.	**Model B Projection Apparatus,** with Wellsbach Lamp, and ¼ plate projection objective,	**80.00**
3115.	**Model B Projection Apparatus,** with Improved Automatic Electric Lamp, and ¼ plate projection objective,	**125.00**
	⅛ Plate Objective extra for any of above,	**14.50**
	⅛ Plate Objective in place of ¼ plate objective for any of above, add	**7.50**

See following pages for description of objectives and lamps.



No. **3140.**

MODEL B PROJECTION APPARATUS.

Fitted with Automatic Electric Lamp and Optical Bench for Microscopic Projection work.

IMPROVED PROJECTION MICROSCOPE.

This attachment to the Model B Projection Apparatus consists of an Optical Bench, attachable to the Projection Lantern, and upon which the various accessories are placed. As used for protecting images of microscopic objects, the accessories are mounted on bases movable in the optical axis by means of rack and pinion.

Delicate objects require protection from the intense heat at the focus of the condensers. This is accomplished by passing the light through an alum cell which absorbs the heat rays, at the same time permitting the light rays to pass to the Abbe condensing system, carried in a separate mounting adjusted to the object stage. The objectives are attached to a revolving nosepiece (double, triple or quadruple as desired), and are focused upon the object by the rack and pinion base, a micrometer screw fine adjustment being also provided for final focusing.

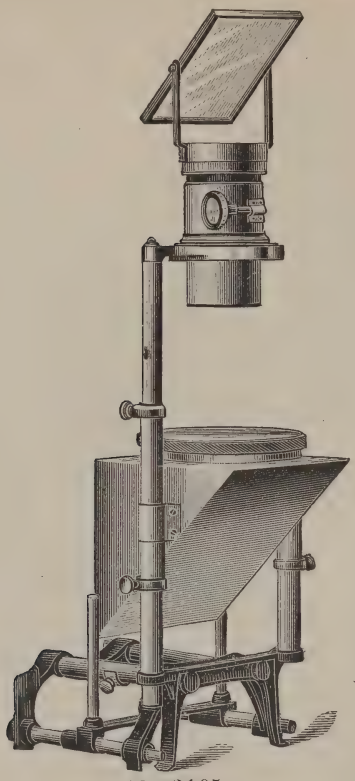
While the accessories just mentioned are sufficient for all ordinary subjects, the **Polariscope** may be added, if desired, as well as the **Crystal Stage,** supports for **Physical Apparatus, Mirror, Tuning Forks, Focusing Lenses, Diaphragms, Chemical Tanks, Parallelizing Lenses,** and every conceivable appliance for projection work.

Each piece being separate, is readily adjustable as desired.

Any desired size of condensing lenses may be used in the adjustable support.

The powers of Projection lenses most practical and suited for use with this Projection Microscope, are described and listed on page 153.

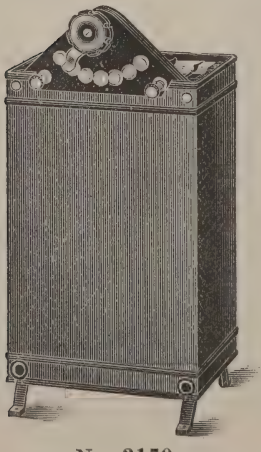
No.		Price.
3120.	Optical Bench, Attachable to Model B Projection Apparatus, including Abbe substage condenser, slide stage and support for one objective,	**$ 80.00**
3125.	No. 3100 with No. 3120, inclusive of alum cell,	**165.00**
3130.	No. 3105 with No. 3120, " " "	**165.00**
3135.	No. 3110 with No. 3120, " " "	**165.00**
3140.	No. 3115 with No. 3120, " " "	**210.00**
3145.	**Nicol Prisms** and supports, per pair,	**67.50**
1500.	**Double Revolving Nosepiece,**	**5.00**
1510.	**Triple Revolving Nosepiece,**	**7.50**
1520.	**Quadruple Revolving Nosepiece,**	**12.00**
3150.	**Parallelizing** and **Amplifying Lens** and supports,	**9.00**
3155.	**Alum Cell,** 3 inches thick,	**9.00**
3160.	**Bellows Hood** and supports,	**9.00**
1400.	**Abbe Condenser** of 1.20 aperture,	**6.00**



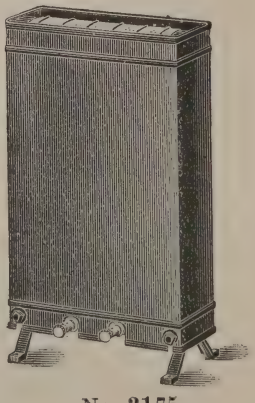
No. **3165.**

No.		Price.
3165.	**Vertical Attachment,** adjustable to Model B Projection Apparatus, - -	**$60.00**

This attachment is made with great care, securing accurate results, and is unequalled for fine finish and adjustability. It may be used in conjunction with the Model B Projection Apparatus, or mounted on special stand for use with other lanterns. The lower mirror, with its condenser support, is vertically adjustable. The sliding support for the objective lens admits of the use of a lens of any desired focus.



No. **3170.**



No. **3175.**

3170.	**Adjustable German Silver Rheostat,** - - - - -	**$24.00**
3175.	**Fixed German Silver Rheostat,** - - - - - - -	**12.00**

These rheostats are suitable for use on low tension currents. They are well made, and exceedingly compact, and made to stand in any position. The case containing the resistance coils is but 13½ inches high and 8 inches wide, and serves as a protection against heat.

IMPROVED AUTOMATIC ELECTRIC LAMP.

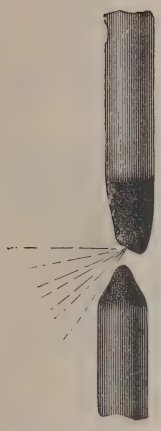


Fig. 1.
Side view of Carbons.

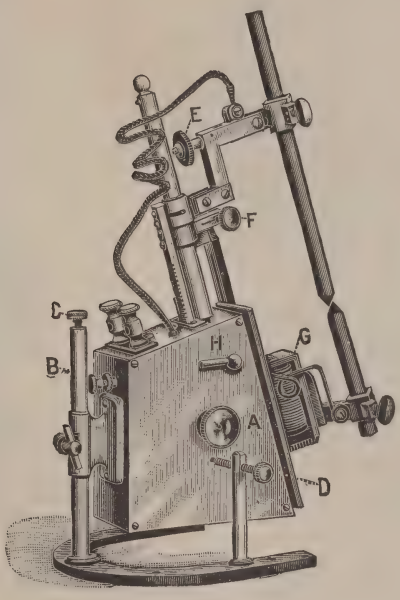


Fig. 2.
Front view of Carbons.

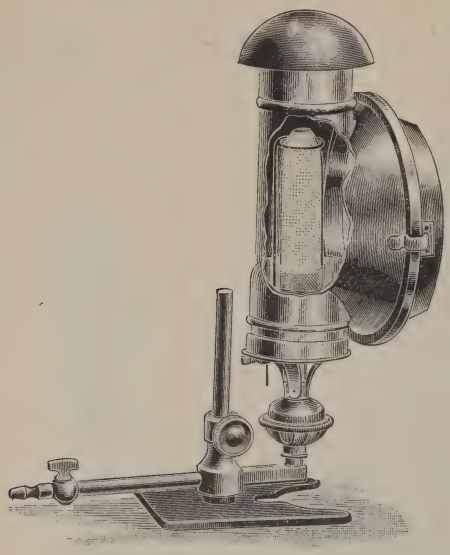
No. Price.

3180. Improved Automatic Electric Lamp, - - - - - - - - - $70.00

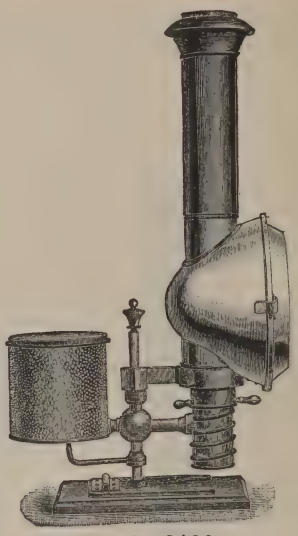
Reference letters in the engraving indicate the following adjustments: C, screw mechanism for raising and lowering the lamp; D, screw mechanism for lateral adjustment of lamp; A, knob for separating carbon holders when fresh carbons are to be inserted; H, adjustment for feeding the carbons together after new ones have been inserted; G, magnet for striking the arc and slightly separating the carbons as soon as the current is turned on; E and F provide for forward and back and lateral adjustments of the upper carbon, so that it may be placed in the most advantageous position in relation to the lower one, as explained further on; B, the adjustment for regulating the length of the arc. We claim for this lamp: That it is the most compact one on the market, the regulating mechanism being contained in a metal case 2 in. thick, $3\frac{1}{4}$ in. wide, and $4\frac{1}{2}$ in. high; it is the only absolutely steady and noiseless self-centering arc lamp suitable for projection purposes. Its mechanism is positive, and the feeding of the carbons is not dependent upon gravity, so that the lamp may be placed with the carbons at any desired angle. It is perfectly insulated and may be handled with impunity, and may be used on any continuous circuit, either arc or incandescent. (We have also perfected a lamp of the same size and general construction for use on the alternating current, particulars of which will be furnished on application.) Owing to its miniature size, it may readily be used on any modern lantern, and is interchangeable with other forms of light. The center of the condensing lenses may be as low as 5 inch. from the base. It may be used with storage batteries. In connection with our adjustable rheostat, the current may be varied at will, thus controlling the amount of illumination.

The carbons should be inclined at an angle, as shown. If they are vertical in relation to the condensers, even if the negative carbon is advanced out of line with the positive, light will also proceed from the negative carbon as well as the positive, thus making two sources of light instead of one—a condition fatal to definition on high-class work. If, however, they are tilted about thirty degrees from the vertical (see cuts Fig. 1 and Fig. 2), the luminous spot on the negative carbon is obscured from the condenser and the crater on the positive carbon is presented in a most favorable way.

Owing to the fact that both carbons are automatically fed to a given point as they are consumed, and that they may be inclined at any angle, it is the only lamp on the market suitable for microscopic and other projections requiring accurate optical results.



No. **3185.**



No. **3190.**

No. Price.

3185. Wellsbach Lamp, - - - - - - - - - - **$18.00**

The Wellsbach Gas Burner is acknowledged to be the best form of gas burner known for illuminating purposes and requires no further description than to say that in adapting it for projection, the light is enclosed in a suitable metal hood with parabolic reflector, converging the greatest possible percentage of its rays upon the screen. As this burner gives more light than the oil lamp and is convenient and clean to use, it should be employed where ordinary illuminating gas is available, in preference to oil.

3190. Reservoir Oil Lamp, - - - - - - - - - - **18.00**

The Reservoir Oil Lamp, as illustrated above, is the most complete oil lamp on the market for the stereopticon.

The burner is of the most approved form, the wick being operated by hard rubber handles which are not easily heated.

The reflector is parabolic, 5 inches in diameter and, having a clear glass window in front and at the top a sheet iron chimney, supplies the place of both hood and combustion chamber. By this arrangement a clear white light is generated in the focus of the reflector, which transmits the entire volume through the condensing lenses.

The oil is contained in a reservoir, the lowest part of which is higher than the part of the wick to which the oil is fed, thus insuring a light of uniform brilliancy as long as there is oil in the reservoir.

The lamp is adjustable in any direction, making it suitable for use with lenses mounted in any convenient way.

It is supplied with the Model B Projection Apparatus, if desired.

3195. Oxy-Hydrogen Jet, - - - - - - - - - - **18.00**

With mechanical means of raising, lowering and turning the lime and adjusting the jet, applicable to Model B Projecting Apparatus.

The most convenient form of vessel for storing and transporting oxygen and hydrogen gases is a strong metal cylinder with seams rivited and brazed and a convenient outlet for attaching hose or valve.

3200. **Steel Cylinder,** with capacity of 25 feet under 225 pounds to the square inch pressure, each, - - - - - - - - - - - - **$22.50**
3205. **Light Regulator Valves,** as shown on top of the cylinders, each, - - **4.00**
3210. **Pressure Gauge,** applicable to any cylinder, - - - - - - **6.00**
3215. **Nickeled Wrench,** for opening and closing cylinder, - - - - **1.00**
3220. **Nickeled Lime Tongs,** for handling hot limes, - - - - - **1.50**
3225. **Limes,** per dozen, - - - - - - - - - - **1.50**

PROJECTION LANTERN OBJECTIVES.

NO.	SIZE.	DIAMETER.	PRICE.
3240	4/4	3 in.	**$32.00**
3245	2/3	2½ in.	**21.00**
3250	1/2	2¼ in.	**14.50**
3255	1/3	1⅞ in.	**12.00**
3260	1/4	1⅝ in.	**7.00**

These objectives are of our own manufacture and are especially corrected for flatness of field and have excellent defining power. They are furnished in adjustable mountings with rack and pinion for focusing.

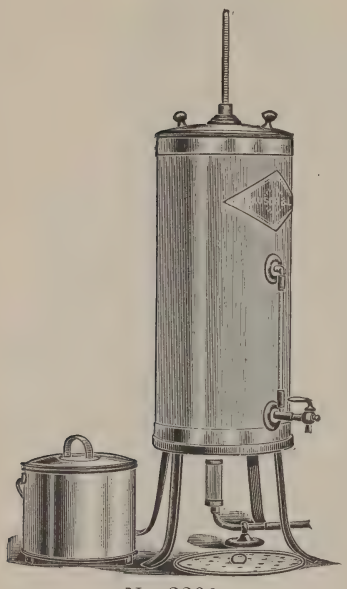
The following table gives the various sizes of pictures to be had with different objectives at varying distances from the screen when three-inch object is used:

SIZES OF LENSES.	10 ft.	20 ft.	30 ft.	40 ft.	50 ft.	60 ft.	70 ft.	80 ft.	90 ft.	100 ft.	110 ft.	120 ft.	Size, in feet, of picture on the screen.
1⅝ inches.	5	10	15	20									
1⅞ "	4	8	12	16	20	24							
2¼ "		6	9	12	15	18	21	24					
2½ "			7½	10	12½	15	17½	20	22½	25			
3 "			6	8	10	12	14	16	18	20	22	24	

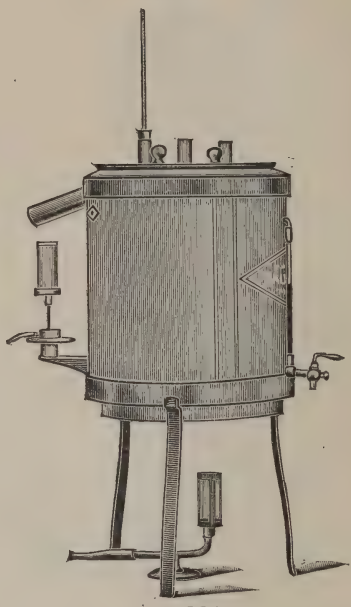
PRICES OF CONDENSING LENSES.

3270. 4⅛ inch diameter - - - - **$2.50** each, per pair mounted, **$10.00**
3275. 4½ " " - - - - - **3.00** " " " **12.00**
3280. 5 " " - - - - **3.75** " " " **15.00**

BACTERIOLOGICAL APPARATUS.



No. **3300.**



No. **3310.**

No. | Price.

3300. **Koch Steam Sterilization Apparatus,** with Thermometer No. 3735b and Burner, No. 3615, - - - - - - - - - - - **$17.00**

3305. **Koch Steam Sterilization Apparatus,** without Thermometer or Burner, - **15.00**

This sterilizer is made entirely of copper, coated with thick sheet asbestos. In order to facilitate cleaning and to prevent wear, the asbestos is covered with white enamel which is baked on at a high temperature and which will not crack or mar. Stop cock and gauge are also provided. The dimensions of the sterilizer with legs attached are,—height, 80 cm., diameter, 30 cm., depth inside, 50 cm.

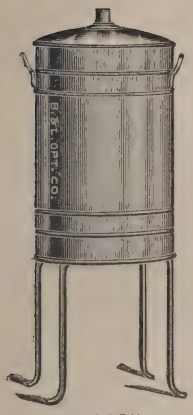
The interior of the sterilizer is divided into two chambers, the upper for steam and the lower for water. The Nutrient Media, Potatoes, etc., to be sterilized are placed in the metal receiver shown in the figure aud lowered into the sterilizing chamber when the temperature reaches 100 C. This apparatus is also useful for filtering Agar Agar as the funnel and receptacle for the Agar can be placed inside during filtration.

3310. **Steam Sterilization Apparatus** for **Blood Serum,** with Thermometer No. 3735b and two Burners, Nos. 3615 and 3625, - - - - - - **23.25**

3315. **Steam Sterilization Apparatus** for **Blood Serum,** without Thermometer or Burners, - - - - - - - - - - - **20.00**

This apparatus also is made entirely of copper, coated with asbestos and enameled. Dimensions with legs attached are,—height, 60 cm., diameter, 45 cm., depth inside, 27 cm.

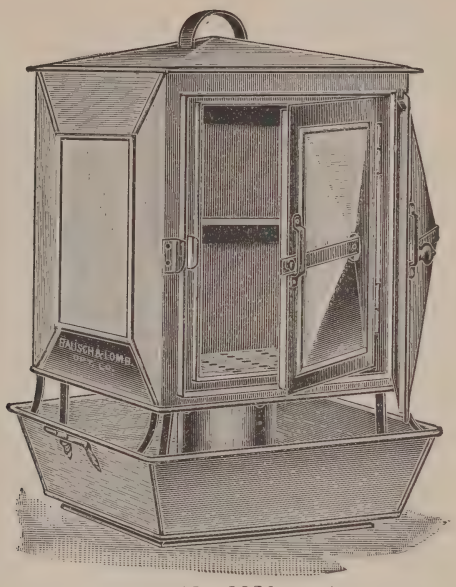
Owing to the extreme difficulty of sterilizing Blood Serum without destroying its value as a culture medium, it is necessary to have a very perfectly constructed apparatus for this purpose. We believe the form herewith listed to be entirely satisfactory. It has double walls, forming an interspace to contain water. The sterilizing chamber is closed with a lid which is also double walled and provided with a tubular prolongation of the water chamber, which permits the water in the lid to be heated separately from that in the cylinder, which is warmed from below. The lid is provided with suitable tubulations for thermometer.



No. 3325.

PHYSICIAN'S STEAM STERILIZER.

ALL COPPER.



No. 3320.

BOSTON BOARD OF HEALTH STEAM STERILIZER.

No.		Price.
3320.	**Steam Sterilizer,** Boston Board of Health form, - - - - -	**$26.00**

This sterilizer is made of copper throughout, with double doors, and is constructed on the same principles as the Arnold Sterilizers on the following page. The large size, square form, and doors opening conveniently, make this sterilizer much more desirable for laboratory purposes than the round or oval shapes.

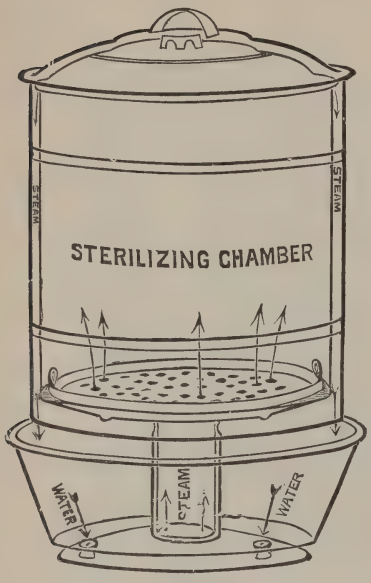
The dimensions are,—height, 40 cm., width, 30 cm., depth, 30 cm.

3322.	**Steam Sterilizer,** Boston Board of Health form, - - - - -	**24.00**

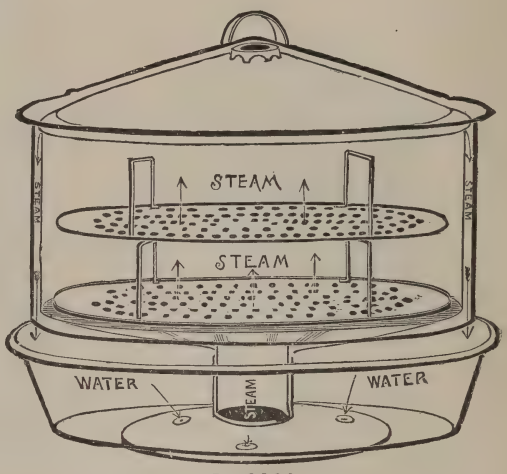
Same as No. 3320, but smaller, height 35 cm., width 20 cm., depth 20 cm.

3325.	**Physician's Steam Sterilizer,** - - - - - - -	**3.50**

This sterilizer consists of a cylindrical copper vessel mounted on suitable legs and having two chambers, one above the other. The lower chamber to contain water, and being separated from the upper, in which the articles to be sterilized are placed, by a removable perforated partition, upon which the tubes or flasks rest. A ring extending around the upper chamber prevents the plugs of the tubes being saturated by moisture condensed on the sides of the chamber. This sterilizer is similar to that used in the Hygienic Laboratories of the University of Michigan for individual work. It will be found admirably suited to the use of physicians and others who do not require extensive apparatus. Depth inside of chamber 8½ inches.



No. **3335.**

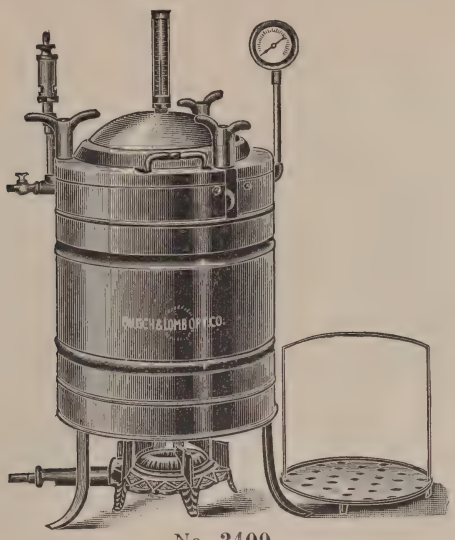


No. **3380.**

No.		Price.
3330.	**Arnold Steam Sterilization Apparatus,** Round, - - - -	**$ 2.50**
	This is the only inexpensive apparatus which maintains an unvarying temperature of 100° C in all parts of the sterilizing chamber, without needing any care or attention. For this reason they are rapidly displacing all other methods heretofore employed by prominent institutions throughout the country, also extensively used by physicians in their offices. It is made of heavy tin with copper bottom. The dimensions are 18 cm. high, 21 cm. diameter.	
3335.	Same as No. 3330, but all copper, - - - - - - - -	**7.00**
3340.	Same as No. 3330, but of dimensions as follows: 25 cm. high, 22 cm. diameter,	**3.00**
3345.	Same as No. 3340, but all copper, - - - - - -	**8.00**
3350.	Same as No. 3330, but of dimensions as follows: 29 cm. high, 25 cm. diameter,	**3.50**
3355.	Same as No. 3350, but all copper, - - - - - - -	**9.00**
3360.	Same as No. 3330, but of dimensions as follows: 32 cm. high, 29 cm. diameter,	**4.00**
3365.	Same as No. 3360, but all copper, - - - - - -	**10.00**
3370.	**Arnold Steam Sterilization Apparatus,** Oval, - - - - -	**5.00**
	This apparatus is the same in construction as the above. The sterlizing chamber is fitted with two racks, or one rack and one zinc tray. It is made of heavy tin with copper bottom. The dimensions are 15 cm. high, 35 cm. long, 22 cm. wide.	
3375.	Same as No. 3370, but all copper, - - - - - -	**6.00**
3380.	Same as No. 3370, but of dimensions as follows: 17 cm. high, 40 cm. long, 25 cm. wide, - - - - - - - - - - -	**7.00**
3385.	Same as No. 3380, but all copper, - - - - - -	**12.50**
3390.	Same as No. 3370, but of dimensions as follows: 20 cm. high, 45 cm. long, 30 cm. wide, - - - - - - - - - -	**15.00**
3395.	Same as No. 3390, but all copper, - - - - - -	**17.50**

SPECIAL SIZES ARE MADE TO ORDER.

AUTOCLAV OR DIGESTOR.



No. **3400.**

FOR STERILIZING AT HIGH TEMPERATURES.

The Autoclav herewith listed is of an entirely new construction, being made after our own designs and with special reference to compactness, durability and convenience of using. The boilers are of the best quality wrought copper, seamless, and are tested and warranted to 50 lbs. to the square inch pressure. We have been able to dispense with the cumbersome arrangement used in the older forms for securing the cover in position, substituting a simple clamping device, which is equally efficient.

The pressure gauge is placed on the side of the boiler, rendering it less liable to be broken. A safety valve is provided which is so arranged that it will relieve the pressure at any desired point thus controlling the temperature automatically. It also has a steam cock, permitting the autoclav to be used for distillations or as a steam generator.

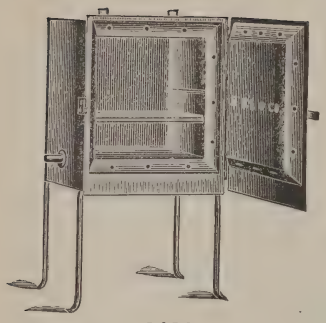
The thermometer is of special construction and is so arranged as to indicate the exact temperature of the inside of the chamber.

The articles to be sterilized are supported in the boiler on a specially devised rack, with one or two shelves, as desired, suitable for either tubes, flasks or plates, and insuring the greatest possible economy of space.

The boiler is supported on a conical iron base, which adds to the efficiency of the burner, and brings the apparatus to convenient height for use.

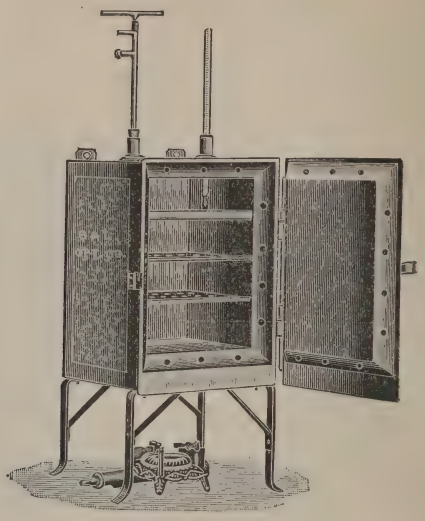
By means of the Autoclav it is possible to dispense with the time consuming methods of discontinuous sterilization, and obtain perfectly sterile media with a single heating of comparatively short duration. It may also be used as an ordinary steam sterilizer for sterilizing at 100°C.

No.		Price.
3400.	**Autoclav,** size of boiler, 9 inches deep, 8 inches diameter inside,	**$54.00**
3410.	**Autoclav,** size of boiler, 12 inches deep, 8 inches diameter inside,	**65.00**
3420.	**Autoclav,** size of boiler, 17 inches deep, 10 inches diameter inside,	**85.00**
	Burner, for either of the Autoclavs, extra,	**2.00**



No. **3430.**

PHYSICIAN'S HOT AIR STERILIZER.



No. **3445.**

ASBESTOS COATED HOT AIR STERILIZER.

No.		Price.
3430.	**Hot Air Sterilizer,** Physician's, without thermometer, thermostat or burner, -	**$10.00**
3435.	**Hot Air Sterilizer,** Physician's, with thermometer No. 3735b, thermostat No. 3700, and burner No. 3600, - - - - - - - -	**13.15**

This apparatus is made of iron throughout, double walled and has ventilators at the top for controlling the temperature. Suitable tubulations for thermostat and thermometer are provided. This is a thoroughly useful instrument for physicians or individual use. The dimensions are, height, 9 inches, width 6 inches, depth 6 inches inside measure.

3440.	**Double Walled Sterilization Apparatus,** Hot air, without thermometer, thermostat or burner, - - - - - - - - -	**18.00**
3445.	**Double Walled Sterilization Apparatus,** Hot air, same as No. 3440, but with thermometer, No. 3735b, thermostat No. 3700, burner No. 3682, -	**22.75**

This apparatus is made of best **Russia Iron** inside, and is **covered** with **heavy asbestos** board; is supported on iron legs and is also provided with hooks so that it may be fastened against the wall. The sterilizing chamber is fitted with three shelves which will accommodate vessels of varying size. The sterilizer is heated from below by means of a powerful burner, the temperature of the interior chamber being indicated by a thermometer inserted through the tubulation in the top. A second tube is provided for a gas regulator. The dimensions are, with legs attached, height 75 cm., width 30 cm., depth 32 cm. The inside dimensions of the chamber being, height 30 cm., width 23 cm., depth 21 cm.

3455.	**Double Walled Sterilization Apparatus,** Hot air, extra large size, - -	**24.00**

This apparatus is in construction the same as No. 3440, but is double the width and preferable for laboratory use. Dimensions are, with legs attached, height 75 cm., width 58 cm., depth 32 cm. Inside dimensions of the chamber, height 30 cm. width 46 cm., depth 21 cm.

INCUBATORS.

As the **pioneer manufacturers** in this country **of incubators** and similar appliances, we offer the following apparatus of **superior quality** and **best adapted** to the requirements of the **American laboratory.** We have embodied in our instruments the suggestions of **eminent American bacteriologists** and have used our own best efforts to bring them to the **highest state** of **perfection.** We lay great stress on the following **advantages of buying** this **apparatus** of **American manufacture** in **preference** to that of foreign make. viz:

Our instruments cost less than the foreign.

We **guarantee** them to be **equally efficient** and **durable.**

It is much **easier** and **costs less** to **repair** one of **our instruments** than to repair one of foreign make and of **unknown construction.**

These instruments are **constantly liable** to **damage** through **overheating, neglect,** etc., and this **item of repair** should be **strongly considered** by those contemplating the purchase of such goods.

We feel sure of meeting the requirements of all with our **new instruments,** as we are now able to produce them capable of **maintaining** a practically **unvarying temperature** and of **sizes** convenient **for every variety** of **laboratory,** from that suited to the individual, requiring only a few cultures, up to the **largest size which can be operated with uniformity of temperature** in **all parts** of the chambers. **Laboratories** requiring **more space** than is afforded by our **largest size** will secure **best results** by using one or more **additional incubators,** although we are **prepared** to **make any** desired **size** or **form** to order.

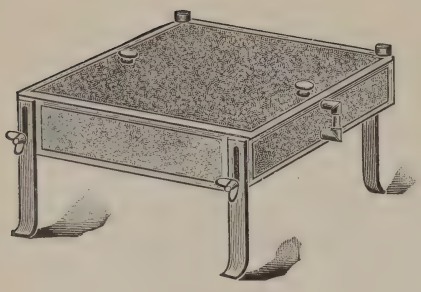
All incubators as now made by us are of **heavy copper** throughout, and the construction is such that the **water chambers** will **not melt** or become **defective** with any **ordinary** amount of heat, should the **water** by any accident become **completely evaporated** from the chambers.

To **secure equality** of **temperature** and to **prevent** undue **loss** of **heat,** the outside is coated with **thick sheet asbestos,** which is afterward **heavily enameled** with white enamel. This **enamel** is **baked on** at a very **high temperature,** hence **will not discolor,** crack or scale. It **may be washed** as often as desired without injury.

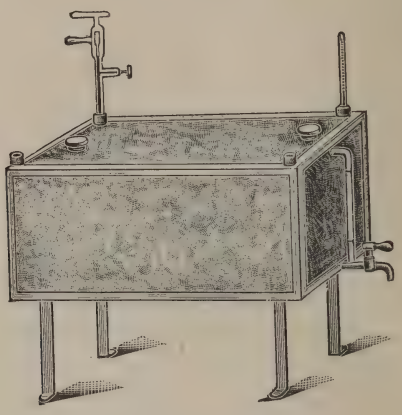
The **walls** of the incubating chamber in numbers 3485, 3487, 3490, 3492, 3495, 3497, are of **fluted copper,** securing **greatest uniformity in distribution of heat.** There are **two doors** of **heavy glass** and with **prismatic fastenings,** thus securing between them a **permanent air chamber** of such effectiveness as to **prevent** the appreciable **radiation** of heat through it. As an **extra precaution,** the **outer** glass **door** is covered with a **movable enameled asbestos panel,** which **permits** the ready **examination** of the condition of **cultures** and **thermometer** in the chambers **without** actually **exposing** them **to the** action of the **outer air.** Free circulation of air in the incubating chamber is secured by taking **fresh air** from **outside** through a tube **traversing the length of** the **water chamber** and delivering the air warmed to the **same temperature** as the **air of** the **chamber.**

When comparing our instruments with those of other make, note the superior **durability** of construction of our apparatus, **perfect fitting** of joints, **hardness** of enamel, **accurate fitting** of doors and such details as **attachment** of **felt** to **edges** of **doors.** In ours this is done by **sewing** the felt **around** a rod which is **rivited** on and which will **last as long as** the **instrument.**

For **Serum Cultures** we have arranged a long **tray, corrugated** to receive **test tubes** on its surface, and which is placed on the **regular shelf supports** so as to stand at the proper angle **for inspissation.** By this means our incubators may be used as **Sterilizers, Inspissators** and **Incubators** combined, for blood serum.



No. **3465.**



No. **3472.**

No.		Price.
3465.	**Apparatus for Solidifying Blood Serum,** - - - - -	**$18.00**

This apparatus consists of a shallow case with cover, both covered with sheet asbestos coated with white enamel. Its dimensions are, with legs attached, 34 cm. high, 27 cm. wide, 10 cm. deep. The case is double walled, and the water contained in the interspace is heated from below. It is supported on four legs. The two front ones move in grooves in the case, so that the latter can be placed obliquely at the angle required and secured in position by screw clamps. It is employed for coagulating sterile liquid serum, and for solidifying nutrient agar-agar so as to give a sloping surface.

3470. **Incubator** (Koch's), exclusive of thermometer and thermostat, - - - **20.00**

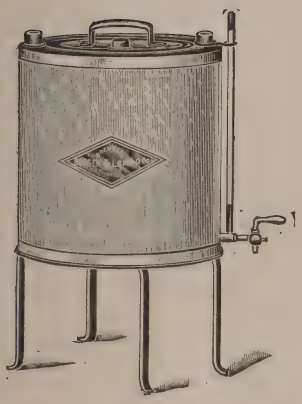
This apparatus is made of copper, tin lined inside, and covered on the outside with thick sheet asbestos coated with white enamel. It has water gauge and stop cock and is supported on four legs. Its dimensions are 50 cm. high, 47 cm. long, 30 cm. wide. The case is double walled. Water contained in the interspace is heated from below. At each end tubes are provided which communcate with the water chamber below. In these thermometer and thermostat can be inserted.

3472. **Incubator** (Koch's) with thermometer No. 3735b and thermostat No. 3705, - **22.75**

3475. **Incubator,** Physician's, without Thermometer, Thermostat or Burner, - - **12.00**

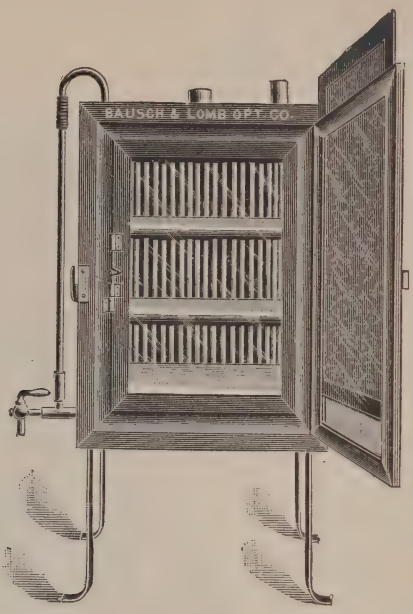
3478. **Incubator,** Physician's, with Thermostat No. 3705, Thermometer 3735b and Burner No. 3620, - - - - - - - - - **15.75**

This Incubator is designed especially for the use of Physicians and others who wish to conduct a series of cultures and who do not require to make a large number at once. It is cylindrical, double walled, and covered with thick asbestos which is coated with white enamel. The incubating chamber is 9 inches high and 8 inches in diameter. The apparatus is mounted on iron legs and has stop cock and water gauge.



No. **3475.**

PHYSICIANS' INCUBATOR.



No. **3485.**

MEDIUM SIZE INCUBATOR.

No.		Price.
3480.	**Incubator,** small size, - - - - - - - - -	**$25.00**

This apparatus is made of polished copper, double walled, with conical bottom. It has the necessary tubulations for thermometer, thermostat, etc., and is supported on four legs. It is made with one compartment having one shelf. There are, however, additional supports for the shelf, permitting the placing of various sized flasks in the chamber. If it is desired to use blood serum, this instrument can be used as a Sterilizer, Inspissator and Incubator by inserting the Test Tube Support described under No. 3571. The door is of glass, with sliding asbestos plate, walls of inner chamber of fluted copper.

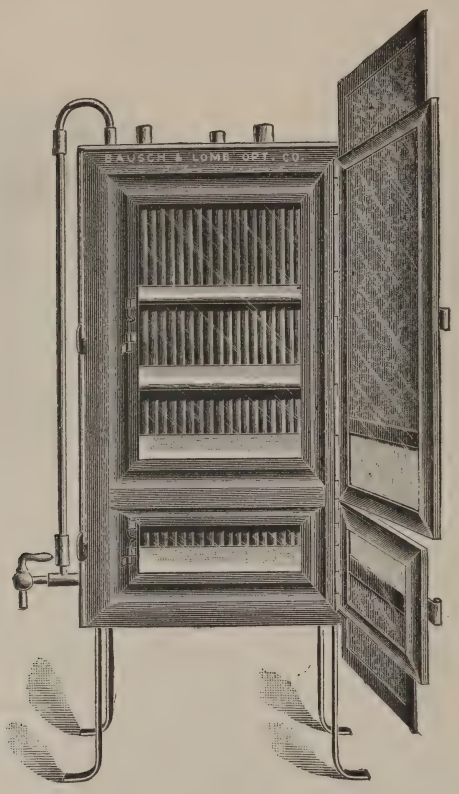
Dimensions of chamber, 23 cm. high, 15 cm. wide, 15 cm. deep.
Outside dimensions, 30 cm. high, 23 cm. wide, 23 cm. deep, exclusive of legs.

3482.	**Incubator,** small size, same as No. 3480, but with Thermometer No. 3735a, Thermostat No. 3705, and Burner No. 3615, - - - - - -	**28.00**
3485.	**Incubator,** medium size, - - - - - - - - -	**35.00**

This apparatus is made of polished copper throughout with water gauge, stop cock and the necessary tubulations for thermometer, thermostat, etc., and supported on four legs. It is double walled, with conical bottom, and finished in the best possible manner. It is made with one compartment, having one shelf. There are two supports for the shelf, thus permitting the use of dishes of various heights. For Blood Serum Cultures it is only necessary to add the Test Tube Support described under No. 3571. Inner and outer doors are of glass, outer with sliding asbestos plate for viewing cultures.

Dimensions of chamber, 30 cm. high, 23 cm. wide, 23 cm. deep.
Outside dimensions, 40 cm. high, 23 cm. wide, 32 cm. deep.

3487.	**Incubator,** medium size, same as No. 3485, but with Thermometer No. 3735a, Thermostat No. 3705, and Burner No. 3615, - - - - - -	**38.00**



No. **3490.**

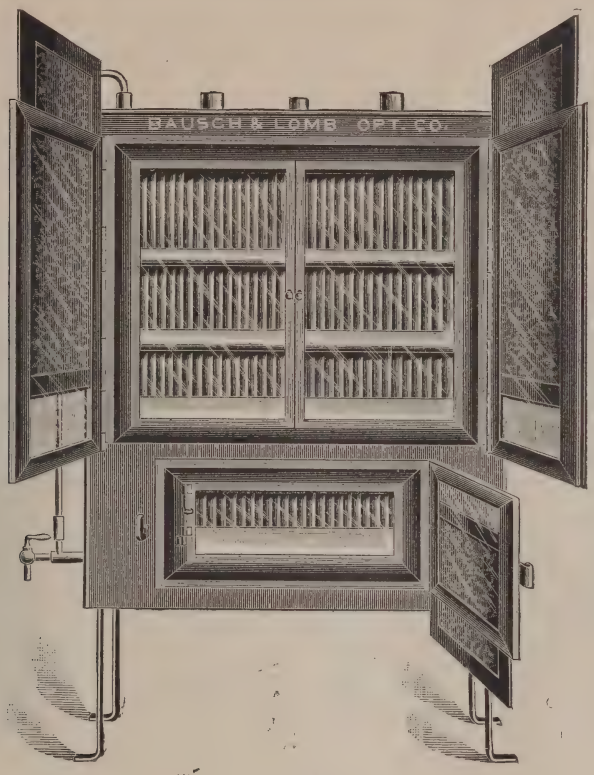
LARGE SIZE INCUBATOR.

No.		Price.
3490.	**Incubator,** large size, - - - - - - - - - -	**$65.00**

This Incubator is made with two compartments, the upper 40 cm. high, 28 cm. wide, 28 cm. deep, and the lower 10 cm. high, 18 cm. wide, 28 cm. deep. Outside dimensions of Incubator, exclusive of legs, 65 cm. high, 40 cm. wide, 40 cm. deep. The metal wall separating the upper and lower chambers is perforated in such manner as to promote the proper circulation of air between the two compartments. The upper chamber has two shelves, and there are three sets of supports for the shelves, permitting the use of vessels of various heights. The Test Tube Support No. 3571 may be used in this chamber if desired for sterilizing and coagulating blood serum and for growing the cultures.

The metal parts of this apparatus are all of polished copper, lacquered to prevent tarnishing. The outer walls are covered with thick sheet asbestos, enameled with our hard white finish. The inner walls of chambers are of fluted copper. There are two glass doors for each compartment, the outer in each having a sliding asbestos plate which permits the observation of objects within, without subjecting them to loss of heat.

3492.	**Incubator,** large size, same as No. 3490, but with Thermometer No. 3740, Thermostat No. 3705, and Koch's Safety Burner No. 3645, - - -	**76.00**



No. 3495.

LARGE LABORATORY INCUBATOR.

No.		Price.
3495.	**Large Laboratory Incubator,** - - - - - - -	**$90.00**

This is our most complete Incubating apparatus, and is as large, we believe, as can be conveniently used with perfect uniformity of temperature in all parts of the chambers. The large size makes it especially suited to an extensive series of cultures such as are required in large college laboratories, the laboratories of health departments, antitoxine cultures, etc. The metal parts are of heavy copper, the exposed surfaces being lacquered to prevent tarnishing. The walls are coated with heavy sheet asbestos, enameled with our hard white enamel finish. There are two double doors for the upper chamber, the two outer having sliding asbestos plates, permitting the examination of the cultures without changing the temperature of the chamber. The lower chamber also has double doors, the outer with sliding plate. The edges of all outer doors are of prismatic form, coated with felt to insure air tight fastening.

The walls of the inner air chamber are of fluted copper, aiding in the equal distribution of heat. The upper chamber has two shelves for culture tubes, etc.

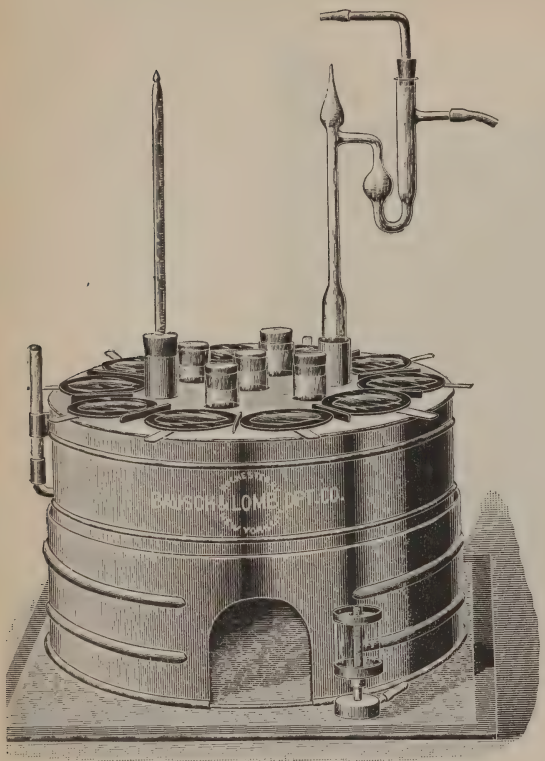
Test Tube Support No. 3571 may also be used in this Incubator for sterilizing and solidifying blood serum and for cultures upon it.

The dimensions are as follows:

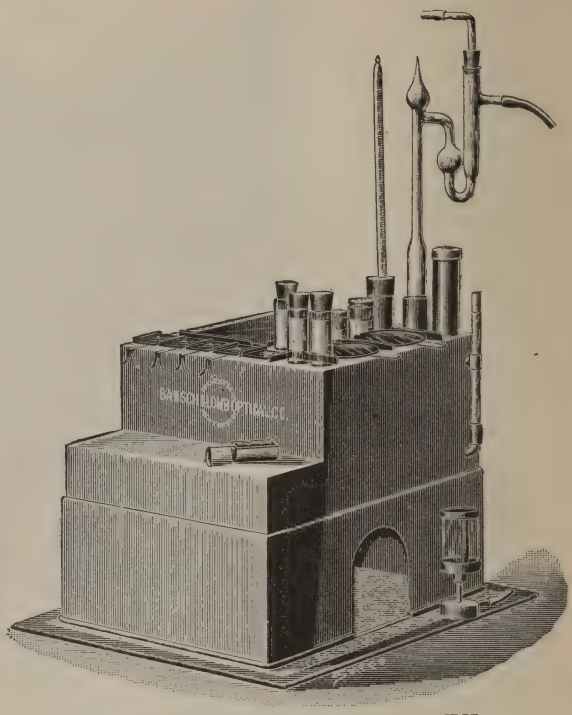
Upper chamber, 40 cm. high, 50 cm. wide, 25 cm. deep.

Lower chamber, 10 cm. high, 30 cm. wide, 25 cm. deep.

3497. **Large Laboratory Incubator,** with Thermometer No. 3740, Thermostat No. 3705, and Double Koch's Safety Burner No. 3650, - - - **105.00**



No. **3501.**—LABORATORY WATER BATH.



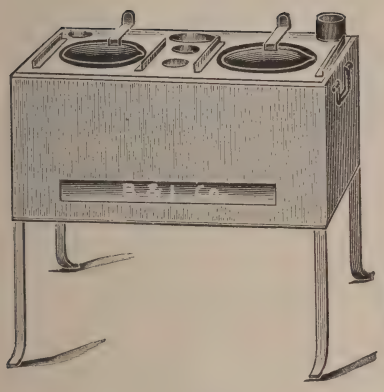
No. **3505.**—NAPLES WATER BATH.

No.		Price.
3500.	**Laboratory Water Bath,** with base and asbestos mat, without Thermometer, Thermostat or burner, - - - - - - - - - -	**$14.00**

The Laboratory Water Bath is 320 mm. in diameter and 90 mm. deep from top plate to bottom of water chamber. It is of heavy copper throughout and has extra bottom to prevent burning out, finished in best possible manner and supported on a Russian iron base which serves to retain the heat of the flame and aids in maintaining uniform temperature. A water gauge at the side indicates quantity of water in the bath. A heavy asbestos plate beneath prevents heating the table and reduces the danger of fire. There are ten nickeled cups for paraffine, seven deep (55 x 45 mm.) and three shallow (60 x 18 mm.), each being covered by a glass plate held in place by metal strips at the side. There are also five glass tubes (25 x 75 mm.) fitted to tubulations extending into the water chamber, and in which imbedding, infiltration, digestion, etc., may be performed. Necessary tubulations for Thermometer and Thermostat are provided. While intended for gas heating, this bath may also be satisfactorily warmed with a small lamp, various temperatures being secured by raising or lowering the cups in their cells and fastening them in place with a simple wedge.

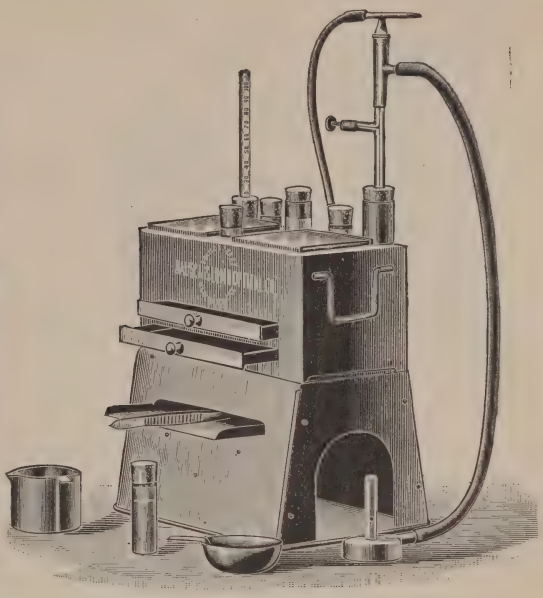
3501.	**Laboratory Water Bath,** as described above, with Thermostat No. 3710, Thermometer No. 3735a, and Burner No. 3625, - - - - - -	**17.75**
3505.	**Naples Water Bath,** with Base and Asbestos mat, without Thermometer, Thermostat or Burner, - - - - - - - - - -	**18.00**

The Naples Water Bath is a complete apparatus for the most delicate work; paraffine imbedding, digestion, preparation of mounting media, etc. It is of heavy copper throughout, with extra false bottom to protect the copper from flame and with base of best Russian iron resting on asbestos plate. The dimensions of the bath are 230 x 300 mm. There are two large cups for stock paraffine. The objects to be embedded are placed in semi-cylindrical nickeled pans 36 mm. long and 14 mm. deep, of which there are five, each with glass cover and support to prevent overturning. There are also three large (25 x 75 mm.) and three smaller (18 x 75 mm.) glass vials fitting into tubulations extending into the water chamber. An imbedding chamber 100 x 140 mm. with tube for Thermometer and with glass cover through which the condition of material may be observed permits the use of



No. **3510.**

PARAFFINE IMBEDDING BATH.



No. **3516.**

MILLER'S PARAFFINE BATH.

No. Price.

watch glasses or vials for imbedding or for digestion experiments, etc. There is a drying chamber under the imbedding chamber which opens at the side of the bath. A warm table 230 x 70 mm. occupies the front of the bath and is very useful for keeping imbedding boxes warm, drying mounts, fixing objects to slides, etc.

3506. **Naples Water Bath,** complete, with Base, Asbestos Plate, Thermometer No. 3735a, Thermostat No. 3710, and Burner No. 3625, - - - **$21.75**

3510. **Paraffine Bath,** with support, - - - - - - - - **6.00**

This Bath is made of polished copper, tin lined, with a false sheet iron bottom. It has two cups provided with glass covers, one being 45 mm. deep and 55 mm. diameter, the other watch glass shaped and 65 mm. diameter and 16 mm. deep. Three bottles also accompany the same. A shelf in the lower part of the Bath is arranged to receive forceps, etc. The dimensions are:

200 mm. long, 100 mm. wide, 100 mm. high, exclusive of legs.

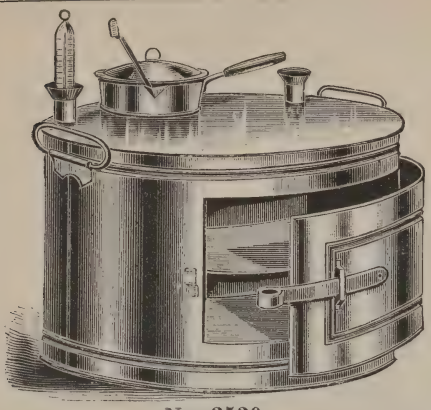
3512. **Paraffine Bath,** No. 3510, with Thermometer No. 3735a, Thermostat No. 3710, and Burner No. 3620, - - - - - - - - **9.50**

3515. **Miller's Paraffine Bath,** with base, exclusive of Thermometer, Thermostat and Burner, - - - - - - - - - **10.00**

The above cut represents an improved form of Paraffine Bath, designed by Dr. W. S. Miller, of the University of Wisconsin, for use in the Histological Laboratory. It presents several advantages over the ordinary form. The Bath is of polished copper and is provided with a false sheet iron bottom to prevent burning out of the copper. There are two cups. One is 45 mm. deep, 55 mm. diameter; the other has the shape of a watch glass and is 65 mm. in diameter and 18 mm. deep. This last form has a great advantage over the ordinary one, especially in imbedding embryological material. Besides these cups, five vials are furnished which may be used for special purposes. There are two sizes of the vials. The Bath has two drawers, each of which holds six slides. They are of especial value in protecting slides from dust and may also be used for "watch glass" imbedding. Each Bath has a sheet iron base which is provided with a shelf on which forceps, spatulas, etc., may be laid to keep warm. The dimensions are as follows:

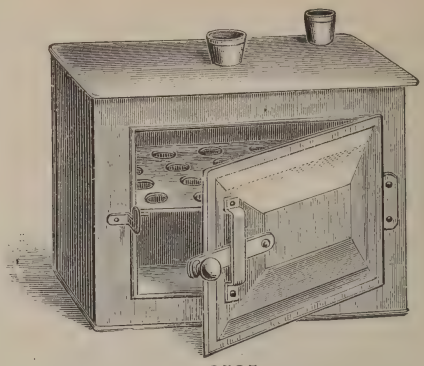
Bath, 200 mm. long, 100 mm. wide, 100 mm. high.
Base, 225 mm. long, 125 mm. wide, 100 mm. high.

3516. **Miller Paraffine Bath,** complete, with Thermostat No. 3710, Thermometer No. 3735a, and Burner No. 3720, - - - - - - - - **13.50**



No. **3530.**

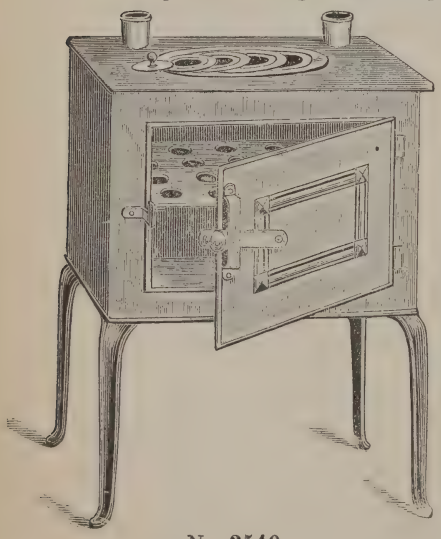
REEVES WATER BATH.



No. **3535.**

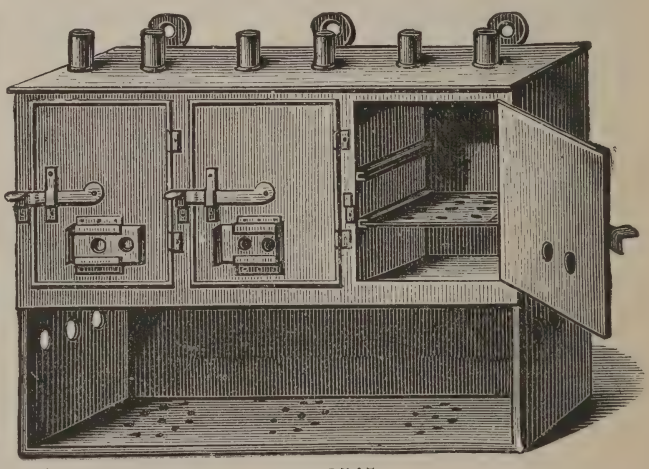
WATER BATH OVEN.

No.		Price.
3530.	**Reeves Water Bath and Oven,** with Thermometer, - - - This Bath is of extra heavy copper, and is extremely useful as a combined imbedding and drying oven. There is a stock paraffine cup of 500 cc. capacity, with handle, cover and object lifter. The drying chamber has removable shelf. Tubulations for Thermometer and Thermostat are provided.	**$10.00**
3535.	**Water Bath Drying Oven,** with iron legs, - - - - - - This Oven is of heavy copper throughout, having an extra sheet iron bottom to prevent burning out, and is supported on iron legs. Inside dimensions 250 x 300 mm.	**10.00**



No. **3540.**

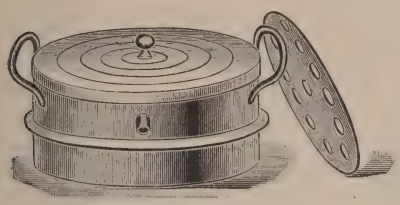
WATER BATH DRYING OVEN, with Water Bath Top.



No. **3545.**

WATER BATH DRYING OVEN, Large Size.

3540.	**Water Bath Drying Oven,** with rings for dishes, - - - - This Bath is similar to No. 3535, but the top plate has a series of rings fitting into each other in which flasks, cups, etc., may be supported, forming a water bath on the top of the oven.	**12.00**
3545.	**Drying Oven,** large size, with double wall, three chambers, each 175 x 175 x 220 mm., base for burners and supports for fastening to wall, - - This Bath is for large laboratories and is of polished copper throughout. The water chamber surrounds the three drying compartments, each of which is 175 mm. wide, 175 mm. deep, and 220 mm. high. Each compartment has its own door, with adjustable ventilator, and has two tubulations and two shelves. The entire bath rests on a sheet iron base, which will contain the burners and which extends up the back of the Bath, forming a support for attaching to the wall if desired.	**20.00**



No. **3550.**

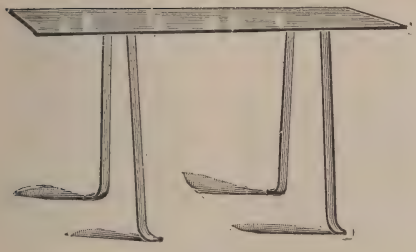
WATER BATH.

No. **3555.**

PARAFFINE IMBEDDING TABLE.

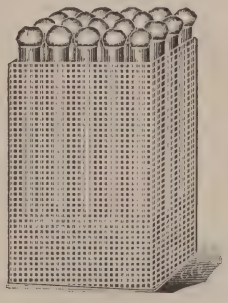
No.		Price.
	Water Bath, of polished copper, tin lined, with concentric copper rings, cover, steam escape and extra plate perforated to receive test tubes.	
3550.	125 mm. diameter, 4 rings and perforated plate, - - - - -	**$1.00**
3551.	150 mm. diameter, 5 rings and perforated plate, - - - - -	**1.25**
3552.	100 mm. diameter, 6 rings and perforated plate, - - - - -	**1.50**
3555.	**Paraffine Imbedding Table,** with supports and two copper trays with glass covers,	**1.50**

This Imbedding Table is intended for imbedding objects in paraffine where an expensive apparatus is not desired. It consists of a triangular copper plate 400 mm. long and 190 mm. wide at the wide end. The plate is supported on three legs. A burner is placed under the acute angle of the plate, the heat being transmitted through the metal. A place will be found at which paraffine will just melt. The copper imbedding trays are placed at this point and imbedding carried on as in the ordinary water bath.



No. **3560.**

WARMING TABLE.



No. **3565.**

TEST TUBE BASKET.

No. **3570.**

PLATE BOX.

3560. **Warming Table,** as suggested by Dr. G. Carl Huber, University of Michigan, Ann Arbor, Mich., - - - - - - - - - **.80**

This table is indispensable for fixing blood preparations to be stained by the Ehrlich methods, etc. Also useful for fixing sections to the slide, drying, mounting, and other similar uses.

3565. **Baskets of Tinned Metal,** 125 x 100 mm. and 150 mm. high, each, - - **.25**

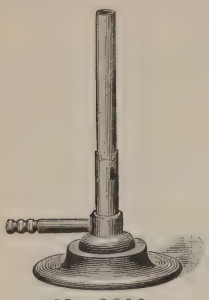
These baskets are necessary for holding test tubes, either filled or empty, especially during sterilization.

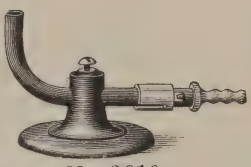
3570. **Metal Box for Culture Plates,** each, - - - - - **1.50**

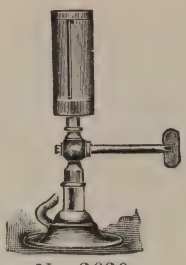
Of sheet iron, with deep overhanging cover, for containing glass culture plates during sterilization, and for storing them until used.

3571. **Support** for **Sterilizing, Solidifying** and **Incubating** Blood Serum preparations, each, - - - - - - - - - **1.00**

These supports are of wire and so arranged that one may be placed upon the other in the Incubator, all remaining at the proper angle of inclination. When ordering, state whether for No. 3480, 3485, 3490 or 3495.


No. 3600.


No. 3610.


No. 3630.

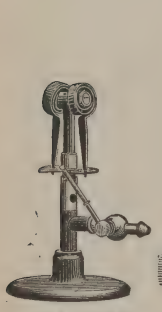

No. 3625.

No.		Price.
3600.	**Bunsen Burner,** with flame check, height 150 mm., each,	**$ .40**
3610.	**Bunsen Burner,** low form, each,	**.50**
3615.	**Bunsen Burner,** low form, with mica chimney, each,	**.75**
3616.	**Bunsen Burner,** with two tubes, 150 mm. high, each,	**.80**
3617.	**Bunsen Burner,** with three tubes, 150 mm. high, each,	**1.00**
3618.	**Bunsen Burner,** with four tubes, 150 mm. high, each,	**1.25**
3620.	**Micro Bunsen Burner,** height 100 mm., without mica chimney, each,	**1.00**
3625.	**Micro Bunsen Burner,** height 100 mm., with mica chimney, each,	**1.25**

Burners 3620 and 3625 are especially constructed for small water baths, etc. The gas is projected into the air chamber through a very small opening, hence a very fine flame can be obtained which may be cut down to smallest point without lighting back.

3630. **Gas Burner,** height 165 mm., with cock and mica chimney, **2.50**

This burner has cock to regulate the amount of gas admitted to the burner.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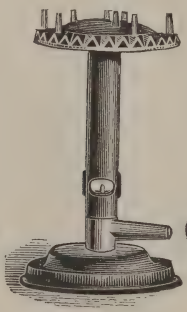
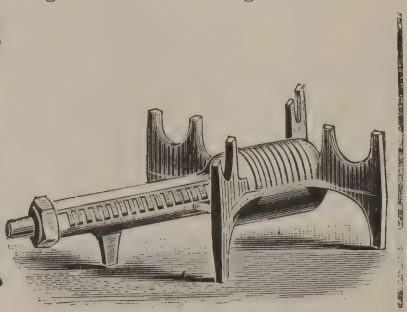

No. 3660.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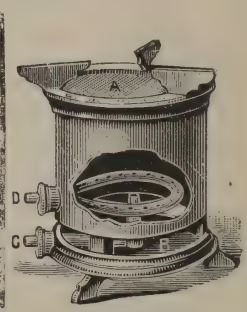


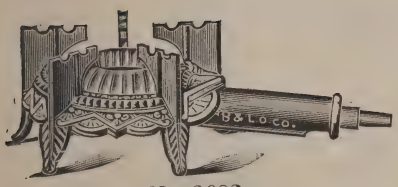
No. 3680.

3635.	**Koch's Safety Burner,** small, with support,	**4.50**
3640.	**Koch's Safety Burner,** medium, with support,	**5.00**
3645.	**Koch's Safety Burner,** large size, on adjustable support,	**8.00**
3650.	**Koch's Safety Burner,** large size, with two safety burners on adjustable support,	**12.00**

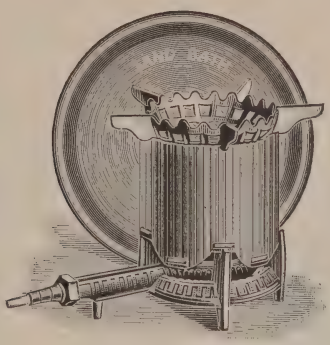
The Koch Burner should in all cases be employed where Incubating or other apparatus is to be left without attention. The burner is so arranged that in case the flame is accidentally extinguished the gas is automatically closed off. As gas pressure is always liable to vary, and draughts, etc., are liable to occur anywhere which might extinguish a low flame, all carefully directed laboratories will take advantage of this safeguard.

3660.	**Star Burner,** with base, diam. of Burner 3½ inches,	**1.00**
3665.	**Star Burner,** with base, diam. of Burner 3 inches,	**.90**
3670.	**Star Burner,** with base, diam. of Burner, 1½ inches,	**.80**
3675.	**Radial Burner,** heats at the rate of 2 qts. water to 100° C. in 12 minutes,	**1.25**
3680.	**Low Temperature Burner,** with blast pipe,	**2.50**

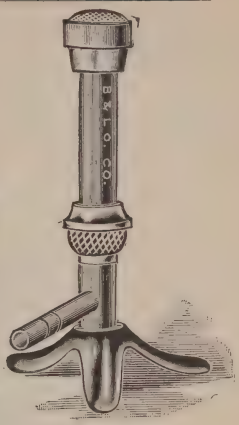
This Burner is so arranged as to give any temperature, from a gentle current of warm air to a red heat, and is so perfectly under control that a flask may be placed on the tripod and heated to any required temperature without the slightest danger of fracture.



No. 3682.
CONCENTRIC RADIAL BURNER.



No. 3683.
LABORATORY GAS BURNER.

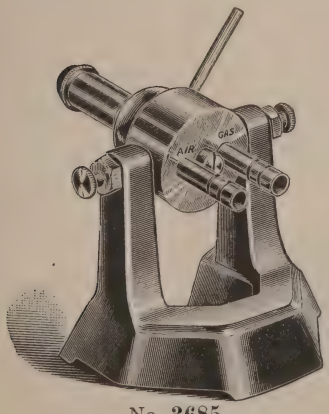


No. 3684.
SAFETY BUNSEN BURNER.

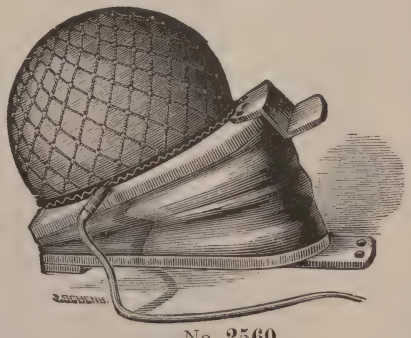
3682. **Concentric Radial Burner,** each, - - - - - - - - **$ 2.00**
This burner has no loose parts and is practically undamageable and indestructible with the roughest use, as it is made of annealed cast iron. It works equally well with either coal, water or air gas. The flames are practically solid when in use, with no tendency to run to a point in the center. Diameter of burner ring, 90 mm.

3683. **Laboratory Gas Burner,** each, - - - - - - - - **4.00**
This burner is of the radial form and is made with a cylindrical support for various forms of vessels by which the distance of the vessel from the flame can be varied. The support will carry round-bottomed flasks, porcelain dishes or flat-bottomed dishes of any size with perfect steadiness. A sand bath 175 mm. in diameter and 25 mm. deep accompanies the burner. The flame will burn down to the lowest point steadily.

3684. **Safety Bunsen Burner,** each, - - - - - - - - **1.50**
With gauze top which prevents the flame from lighting back. The gauze slides in, and in case of accident can be replaced in a few seconds. The burner is mounted on a brass stand and is 120 mm. high.



No. 3685.

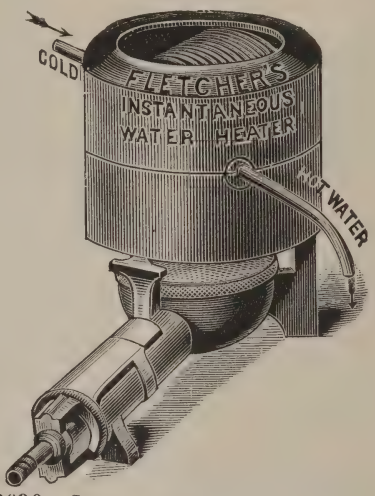


No. 2560.

3685. **Compound Blow Pipe,** for glass blowing, etc., - - - - **12.00**
This is a double concentric blow-pipe, the gas and air being changed automatically from the larger to the smaller blow-pipe by a slight movement of the lever at the back, the same movement also adjusting both gas and air to each other for each blow-pipe. The combination of two blow-pipes in this manner gives a great range of power from a delicate pointed jet to a brush flame. This burner is of sufficient power and range for the glass work and similar operations requiring high temperatures in the Bacteriological and Biological Laboratory. Foot Blower, No. 2560, or some other blower of equal power, is required for use with it.

2560. Foot Power Blower, with rubber disc and netting, - - - - **$5.50**
This blower can be used on a dusty floor without taking up dust.
2561. Extra Rubber Discs for No. 2560, each, - - - - - - **.70**
2562. Extra Nets for No. 2560, each, - - - - - - - - **.50**

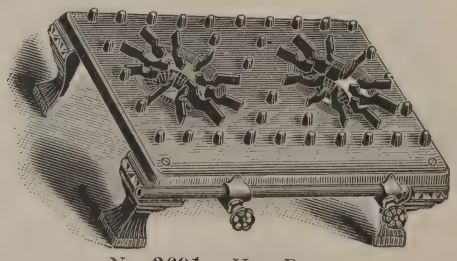
No. **3689.**—Laboratory Lamp.



No. **3690.**—Instantaneous Water Heater.

3689. Laboratory Lamp, with automatic draught, - - - - - **6.00**
This lamp is entirely of metal with large oil reservoir. A spring mechanism in the base actuates a fan causing a continuous draught, and giving a highly luminous and smokeless flame, no chimney being required. This is a very useful lamp when oil is required as an illuminant for laboratory work.

3690. Instantaneous Water Heater, complete with burner, - - - - **6.00**
This is an extremely useful piece of laboratory furniture as it will, when connected to ordinary cold water supply, deliver hot water within three seconds after the gas is lighted, and any temperature may be maintained, warm, hot or boiling. It is of simple construction, not liable to get out of order or wear out.



No. **3691.**—Hot Plate.

3691. Hot Plate, with two Radial Burners, 95 mm. in diameter, each, - - **6.00**
The points and supports over the top of the plate are the same height, giving a level surface for the support of the vessel to be heated. Size of top of plate 290 x 475 mm. Each burner has separate valve controlling flame.

No. 3692.—Alcohol Lamp.

No. Price.

3692. **Alcohol Lamps,** of glass, with metal burner and extinguisher. The body of the lamp is of such form that it may be placed with the flame at four different angles.

Size,	*a*	*b*	*c*
Diam. of Burner,	5	7	12 mm.
Price, each,	**$ .70**	**.80**	**1.00**

3693. **Alcohol Lamps,** of glass, with glass cap for extinguisher and with side tube for filling. The body of the lamp is cylindrical and the bottom flat to prevent overturning.

Size,	*a*	*b*	*c*	*d*
Capacity,	30	60	100	150 cc.
Price, each,	**$ .40**	**.45**	**.50**	**.60**
Per dozen,	**4.00**	**4.50**	**5.00**	**6.00**

3694. **Wellsbach Microscope Lamp,** with metal chimney and bulls eye lens, - **$9.00**

3695. **Wellsbach Microscope Lamp,** with metal chimney and without bulls eye lens, **6.75**

3696. **Wellsbach Microscope Lamp,** without metal chimney, - - - - **5.50**

3697. **Glass Chimney for Wellsbach Lamp,** each, - - - - **.25**

3698. **Extra Mantle for Wellsbach Lamp,** each, - - - - - **.85**

The Wellsbach light is superior to all other forms of gas or oil lights for optical work on account of its intensity, whiteness, steadiness and economy. We have, therefore, divised a lamp using the Wellsbach burner, and especially adapted for use with the microscope.

The lamp consists of a heavy metal base, neatly japanned, supporting the Wellsbach burner, with gas connection, and of proper height for convenient work. Around the burner is a black metal chimney shielding the eyes from the intense glare of the light, and provided with a bulls eye lens so adjusted as to project a beam of parallel rays on the microscope mirror. With this lamp, wherever common illuminating gas is available, the microscope may be used with about the same ease and effectiveness as when sun light is employed.

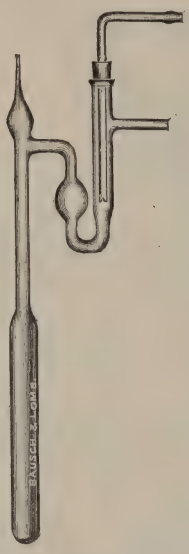
3699. **Oil Burner Microscope Lamp,** with metal chimney and bulls eye lens, each, - **1.75**

This is a neat glass lamp with efficient oil burner, and provided with metal chimney fitted with bulls eye lens, giving a parallel beam of light on the microscope mirror. A very serviceable lamp for microscope work where gas cannot be used.

THERMOSTATS.

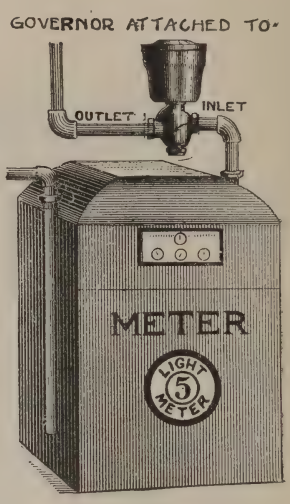
No. **3700.**

IMPROVED REICHERT THERMO-REGULATOR.



No. **3725.**

DR. DUNHAM'S THERMO-REGULATOR.



No. **3730.**

GAS PRESSURE REGULATOR, As attached to Meter.

No.		Price.
3700.	**Improved Reichert Thermostat,** for high temperatures,	**$1.50**
3705.	**Improved Reichert Thermostat,** for low temperatures,	**1.50**
3710.	**Improved Reichert Thermostat,** short form for Paraffine Baths,	**1.50**

These Thermostats are carefully made and each one tested. As the temperature can be more accurately controlled if adjusted to a certain caliber of burner, we have standardized the No. 3700 so that it may be used with burners having an equal or greater capacity than Burner No. 3610. No. 3705 is standardized for burners having as low capacity as No. 3620, and may be used with all burners between 3620 and 3650. No. 3710 is for use with 3620 or 3625.

3725. **Thermostat, Dr. Dunham's,** with fluid and mercury for filling, **3.50**

This is an extremely sensitive and simple gas regulator, and one which should be used on Incubators and similar apparatus when accurate control of temperature is required. Its sensitiveness depends on the fact that the unusually large bulb is filled with alcohol, this fluid being extremely sensitive to temperature changes. The alcohol acts on the column of mercury in the U-shaped bulb arm and the requisite adjustment is attained by sliding the gas tube up or down as required. Variations of less than $\frac{1}{10}$ degree are easily obtained. Directions for filling and using accompany each.

3726.	**Thermostat, Dr. Dunham's,** glass parts only,	**2.00**
3728.	**Thermostat, Soxlets',** very sensitive, each,	**1.00**
3730.	**Gas Pressure Regulator,** each,	**15.00**

This Pressure Regulator is intended to be used in laboratories where the gas pressure is subject to considerable fluctuation. It is attached to the gas pipe next the meter, all the gas used passing through it. It can be regulated to give any desired pressure, and will thus relieve the thermostats used with Incubators, etc., of every element of danger from excessive gas pressure, at the same time effecting a great saving in consumption of gas all over the building.

THERMOMETERS.

No. 3735.

No. Price.

3735. Chemical Thermometers, with Fahrenheit and Centigrade scale etched on the stem.

These Thermometers are carefully and accurately graduated and tested. The tube has lens front, magnifying the column of mercury, thus facilitating accurate reading and reading at a distance. Furnished in wood case:

A Length 200 mm., graduated — 10° to + 100° C. and to 200° F., each, - - - - - - - - - **$1.00**

B Length 300 mm., graduated — 10° to + 150° C. and to 300° F., each, - - - - - - - - **1.25**

C Length 350 mm., graduated — 10° to + 200° C. and to 400° F., each, - - - - - - - - **1.50**

D Length 400 mm., graduated — 10° to + 360° C. and to 700° F., each, - - - - - - - - **2.00**

3736. Chemical Thermometers, calibrated, of Jena Normal Glass. For laboratory use.

The graduations are cut in the tube, with white back ground and are absolutely accurate above as well as below zero.

A Length 300 mm., graduated in degrees, — 20° to + 100° C., each, **1.00**

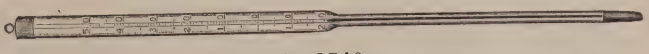
B Length 400 mm., graduated in degrees, — 20° to + 250° C., each, **1.25**

C Length 450 mm., graduated in degrees, — 20° to + 360° C., each, **1.50**

3738. Chemical Thermometers, with glass ring and paper scale. Graduated in degrees both Farenheit and Centigrade.

A Length 100 mm., graduated, — 20° C. to + 100° C. and 212° F., each, - - - - - - - - **.60**

B Length 120 mm., graduated, + 100° C. to + 220° C. and 450° F., each, - - - - - - - - **.75**



No. 3740.

3740. Incubator Thermometer, long form.

These Thermometers are extremely accurate and are intended for reading the temperature of incubating apparatus from the outside of the chamber. The scale is on a white glass plate placed directly back of the mercury tube and protected by a glass cylinder which surrounds it. This arrangement of the scale permits the Thermometer being read at a considerable distance. The graduations begin 150 mm. from the mercury bulb, hence the bulb may be inserted deeply in the Incubator and yet all the graduations remain visible.

Total length 250 mm., graduated — 20° to + 50° C., each, - - **2.00**

No. 3745.

3745. Incubator Thermometer, short form, exactly same as above, but with graduations beginning at the bulb and with ring, to hang inside incubating chamber, graduated — 20° to + 50° C., each, - - - - - - - **.75**

No. Price.

3746. **Maximum and Minimum Incubator Thermometer, Sixe's,** each, - - **$5.00**

This theremometer is a self-registering maximum and minimum, Sixe's system, in glass cylinder with white glass scale having black graduations. The scale is 160 mm. long and its protecting cylinder 25 mm. in diameter. The lower extension of the tube ending in mercury bulb is 200 mm. long and 10 mm. in diameter. The graduations are in degrees and the register runs from — 20° to + 50° centigrade. This thermometer may be placed in the incubator exactly as No. 3740, but has the additional advantage that the higest and the lowest temperature occurring in the chamber will be recorded. In external appearance this thermometer is like No. 3740.

3748. **Tree Thermometer,** for ascertaining the temperature of the interior of plants, etc. Scale 200 mm. long, protected by glass cylinder, bulb tube bent at right angles, and with brass cap for attaching to tree, each, - - - - - **2.00**

3750. **Psychrometer,** wet and dry bulb mounted on neat metal support, each, -

The thermometers are of Normal Glass with white glass scale graduated in $\frac{1}{5}$° from — 20° to + 50° c. An entirely reliable instrument for laboratory use. Height 300 mm. - - - - - - - - - - **5.00**

3751. **Aræometer,** after **Baume,** for determining specific gravity. Two aræometers, one for light and one for heavy liquids, graduated 0.700 to 1.000 and 1.000 to 2.000, each, - - - - - - - - - - **1.75**

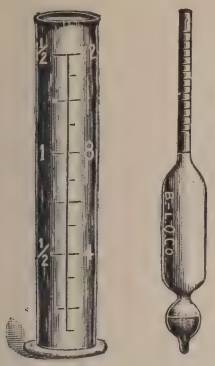
3752. **Aræometer,** after **Baume,** for determining specific gravity. Two aræometers, one for light and one for heavy liquids, graduated 0.700 to 1.000 and 1.000 to 2.000, with thermometer in wooden case, each, - - - - - **3.25**

3753. **Alcoholometer, U. S. Custom House Standard,** with Tralles and Proof Mark scale, graduated 0 to 100 Tr., with thermometer, in wooden case, - **1.25**

3754. **Lactometer, Quevenne's,** graduated 15 to 40 in $\frac{1}{2}$°; with yellow and blue scale and scale indicating per cent. of cream and milk, and amount of dilution in $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, $\frac{4}{10}$ and $\frac{5}{10}$. This Lactometer has mercury bulb and round spindle. Furnished in wooden case, each, - - - - - - - - - **.50**

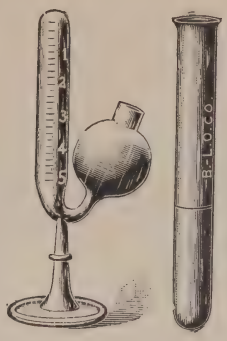
3755. **Lactoscope, Feser's,** one graduated cylinder, volume pipette, and directions for using, all in polished wood case, each, - - - - - - **4.00**

3756. **Pioscope, Heeren's,** a hard rubber plate with graduated glass disc for determining the comparative richness of milk, with directions for using, each, - - **.75**



No. 3758.

No. 3760.



No. 3762.

No. 3763.

No.		Price.
3758.	**Urinometer, Dr. Squibb's,** 120 mm. long, graduated 1.000 to 1.060, with mercury filled bulb, graduated cylinder and directions for using, in case, each,	**$ .60**
3760.	**Albuminometer, Esbach's,** for direct reading of amount of albumen in urine. Scale graduated on the tube, with directions for using, each,	**.75**
3762.	**Saccharometer, Dr. Einhorn's,** fermentation. The apparatus consists of one graduated fermentation tube and graduated test tube in case with directions for using. The per cent. of sugar in urine is read directly from the scale, complete,	**.90**
3763.	**Fermentation Tubes,** large size, ungraduated, each,	**.25**
3764.	**Fermentation Tubes,** medium size, ungraduated, each,	**.20**
3765.	**Ureometer, Doremus',** for determination of amount of urea in urine by hydrobromate method. Consists of a graduated tube shaped like No. 3762, and graduated pipette for introducing the hydrobromate solution graduations read to $\frac{1}{10}$ per cent., each,	**1.50**
3767.	**Urea Apparatus, Dr. Squibb's,** for the estimation of urea in urine by displacement, complete with vials, graduated pipette, graduated cylinder, 50 cc. bottle of chlorinated lime, three cards giving applicable regents, table of approximate proportions of urea and directions for using, complete,	**2.50**

No. 3770.

No. 3775.

No. 3776.

3770.	**Urine Sedimentation Glasses,** conical, graduated, each,	**.50**
3771.	**Urine Sedimentation Glasses,** conical, ungraduated, each,	**.25**
3775.	**Conical Graduates,** with base, graduated in cc., with handle. The addition of a handle to the graduate increases convenience and safety of handling.	

Capacity cc.,	10	25	50	100	250	500	1000
Price, each,	**$ .25**	**.30**	**.40**	**.50**	**.75**	**1.00**	**1.75**

3776.	**Conical Graduate,** with handle, 1500 cc. capacity, scale of white glass burned on, each,	**1.00**
3777.	**Hydrometer Jars,** with base and pour-out, 500 cc. capacity, each,	**.60**

No. 3780.

No. 3784.

No. 3785.

No. 3788.

No. 3790.

No. | Price.

3780. **Cylindrical Graduates,** with foot lip and pour-out, graduated with greatest accuracy in cc.

Capacity in cc.,	10	25	50	75	100	150	200	250	500	1000
Price, each,	**$.28**	**.35**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**1.10**	**2.00**

3784. **Mixing Cylinders,** with graduated foot, ground glass stoppers, graduated with greatest accuracy in cc.

Capacity in cc.,	25	50	75	100	150	200
Price, each,	**$.50**	**.60**	**.70**	**.80**	**.90**	**1.00**

3785. **Mohr's Burettes,** graduated with greatest accuracy, and for either pinch cock or to be used as finger pipettes.

Capacity in cc.,	1	2	5	10	25	50	100
Graduated in	$\frac{1}{100}$	$\frac{1}{50}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$ cc.
Price, each,	**$.50**	**.50**	**.50**	**.50**	**.80**	**1.00**	**2.00**

3786. **Rubber Tube, Glass Point and Pinch Cock,** for Mohr's Burette No. 3785.

Size,	1	2	3	4
Price, each,	**.15**	**.20**	**.25**	**.30**

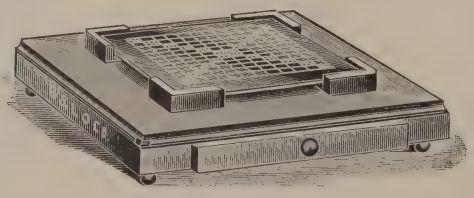
3787. **Mohr's Burettes,** with glass stop cock.

Capacity cc.,	10	25	50	100
Graduated in	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$ cc.
Price, each,	**$1.25**	**1.50**	**1.75**	**2.00**

3788. **Volume Pipettes,** accurately graduated, mark indicating the capacity of pipette at 60° F.

Capacity in cc.,	1	2	3	4	5	10	20	25	50
Price, each,	**$.10**	**.10**	**.12**	**.12**	**.14**	**.16**	**.20**	**.25**	**.30**

3790. **Volume Tube,** with graduation 10 cc., each, - - - - - **$.15**



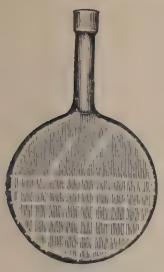
3795. **Wolfhuegel's Counting Apparatus,** for counting colonies in plate cultures, each, **5.00**

This apparatus consists of a cherry base containing drawer for accessories and supporting the ruled glass plate. The rulings are 1 cm. square, with the diagonal rows of squares from the corner ruled to 3 mm. square. The ruled portion is 12 cm. square. A black and a white plate are provided for back ground.

3796. **Esmarch's Counting Apparatus,** for counting colonies in tube cultures, to be held in the hand. The tubes are held in an adjustable clamp. A suitable magnifier adjustable for focus is provided. Each, - - - - **4.00**

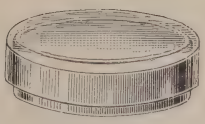
3797. **Esmarch's Counting Apparatus,** on stand, each, - - - - **6.75**

This apparatus is similar to No. 3796, but is mounted on a japanned base. Two plates of glass, black and white, are provided for background.

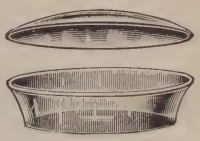


No. 3799.
SOYKA'S FLASK.

No. 3800.
PASTEUR DISH.



No. 3802.
PETRI DISH.



No. 3805.
PREPARATION DISH.

No. | | Price.

3798. **Soyka's Culture Flask,** not graduated, each, - - - - - - **$.60**

3799. **Soyka's Counting Flask,** thin walled, graduated in quarter centimeters, very convenient for water examinations, etc., each, - - - - - **1.00**

3800. **Pasteur Dish,** a double dish similar to the Petri dish, but thinner walled and shallower, 10 mm. deep, permitting the use of lower power objectives for examining the colonies. Diameter 100 mm., depth 10 mm., each, **$ .30** per doz., **3.00**

3802. **Petri Dishes** (or Esmarch's dishes), a double dish, the upper fitting loosely over the lower. These are of best white German glass and thinner than the old form.

Diameter in mm.,	50	80	100	120	150
Price, per pair,	**$ .18**	**.22**	**.25**	**.35**	**.45**
Per dozen pairs,	**2.00**	**2.40**	**2.75**	**3.75**	**5.00**

3805. **Preparation Dish,** with convex cover ground on air tight. This dish may be sealed for permanent preservation or used without sealing for ordinary purposes. Of clear white glass.

Height in mm.,	40	44
Diam. in mm.,	80	100
Price, each,	**$.40**	**.50**

No. 3810.
MOIST CHAMBER.

No. 3815.
PASTEUR FLASK.

No. 3820.
STERNBERG'S FLASK.

No. 3825.
BULB PIPETTE.

No. 3830.
POTATO TUBE.

3810. **Moist Chamber,** set of two dishes of heavy white glass, the upper with knob.

Size,	A	B
Inside diam. of upper dish in mm.,	180	240
Inside height of upper dish in mm.,	70	70
Inside diam. of lower dish in mm.,	195	255
Inside height of lower dish in mm.,	50	50
Price, per pair,	**$1.00**	**1.75**

3815. **Pasteur Flask,** for fluid cultures, etc., with cap ground on.

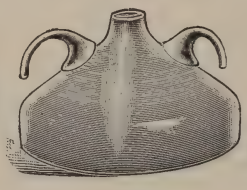
Capacity in cc.,	50	100	200
Price, each,	**$.40**	**.50**	**.60**

3820. **Sternberg's Flask,** for serum, etc., a thin flask with neck drawn to a point, of clearest white glass; capacity 25 cc.; price, each, **$ .20;** per doz., - - **$2.00**

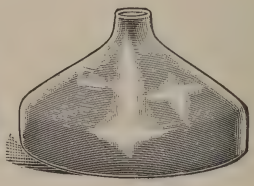
3825. **Bulb Pipette,** Pasteur's, each, **$ .30;** per doz., - - - - - **3.00**

3830. **Potato Culture Tube,** Pawlowski's, with constriction for prepared potato to rest upon; each, - - - - - - - - - **.10**

No. 3835.



No. 3840.



No. 3845.

No. | Price.

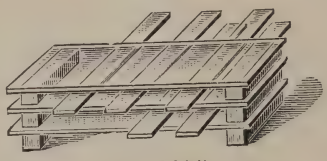
3835. **Antitoxine Flask,** with one side neck, capacity 3000 cc., of best white glass; each, **$1.50;** per doz., - - - - - - - - **$15.00**

3840. **Antitoxine Flask,** with two side necks, capacity 2000 cc, of best white glass; each, **$1.50;** per doz., - - - - - - - - **15.00**

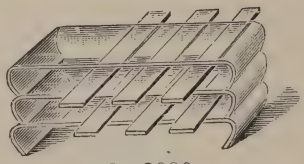
3845. **Antitoxine Flask,** plain, capacity 2000 cc., of best white glass; each, **$1.25;** per doz., - - - - - - - - - - - - **12.00**

No. 3850.

No. 3855.



No. 3875.



No. 3880.

No. 3895.

3850. **Koch's Flasks,** of best quality Bohemian glass, especially for bacteriological work.

Capacity cc.,	100	250	500	1000	2000
Price, each,	**$ .10**	**.15**	**.20**	**.35**	**.45**
Per doz.,	**$1.00**	**1.50**	**2.00**	**3.50**	**5.00**

3855. **Koch's Flasks, Erlenmeyer Form,** of best quality Bohemian glass, especially for bacteriological work.

Capacity cc.,	50	100	250	500	1,000
Price, each,	**$ .10**	**.15**	**.20**	**.25**	**.40**
Per doz.,	**$1.00**	**1.50**	**2.00**	**2.50**	**4.00**

3875. **Glass Benches,** for supporting culture plates, of one piece of glass with edges bent under, each, - - - - - - - - - **.25**

3880. **Glass Benches,** for supporting culture plates, 130 mm. long, 55 mm. wide, polished edges, glass cross-pieces cemented on, each, - - - - - **.25**

3885. **Culture Plates,** of extra white glass, 130 x 85 mm., edges not ground, per doz., **.45**

3890. **Culture Plates,** of extra white glass, 130 x 85 mm., edges ground round, per doz., **.60**

3895. **Test Tubes, with Base** and lip.

Height,	100	130	150
Diameter,	16	20	25
Price, each,	**$.08**	**.10**	**.12**
Per doz.,	**$.75**	**.85**	**1.00**

No. Price.

3900. Test Tubes, with lip, very best quality, thin walled of clearest Bohemian glass free from bubbles and imperfections, and especially made in three sizes only for Bacteriological work.

Length in mm.,	130	150	180
Diam. in mm.,	13	15	18
Price, per dozen,	$ .30	.40	.50
Per gross,	3.00	4.00	5.00

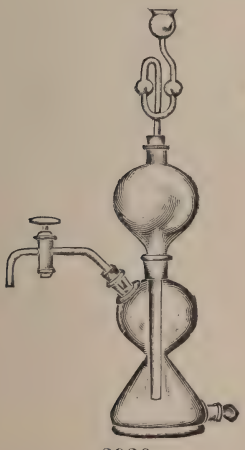
3905. Test Tubes, of Bohemian Glass, with lip, good quality.

Length in mm.,	75	100	120	150	180	200
Diam. in mm.,	11	12	14	16	18	20
Price, per doz.,	$ .18	.20	.24	.30	.40	.50
Per gross,	1.75	2.00	2.40	3.00	4.00	5.00

3910. Test Tubes, without lip, Board of Health form, heavy with rounded bottom.

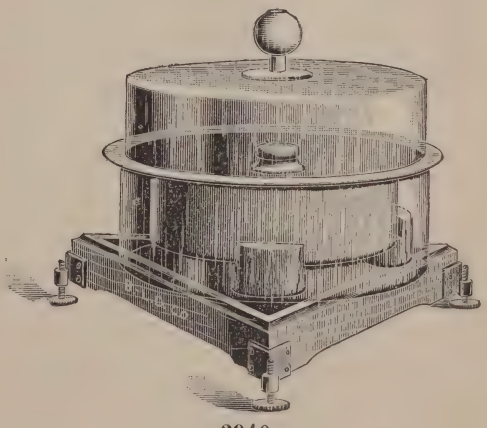
Length in mm.,	100	100	120	150
Diam. in mm,	12	15	13	13
Price, per dozen,	$ .25	.30	.25	.35
Per gross,	2.50	3.25	2.75	3.75

3915. Drop Culture Slide, 75 x 25 mm., of polished plate glass, with cavity 18 mm. diameter ground in, each, **$ .30,** per dozen, - - - - - **$3.00**



3930.
KIPP'S GAS GENERATOR.

3935.
DRECHSEL'S WASH FLASK.



3940.
NIVELLATING APPARATUS.

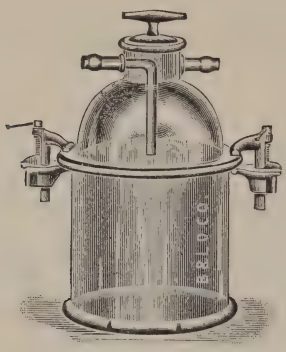
3930. Kipp's Gas Generator, of glass, with safety tube and glass stop cock, capacity of each receiver 1000 cc., price complete, - - - - - - **5.00**

3935. Gas Wash Flask, Drechsel's, capacity 500 cc., each, - - - **2.00**

3940. Nivellating Apparatus, for solidifying culture media, complete with triangular base having three leveling screws, double glass receiver for ice, ground glass plate for supporting plates, bell jar cover with knob and circular level, - - **8.00**

3945. Do., Glass Parts, only, - - - - - - - - **2.00**

3947. Circular Level, only, - - - - - - - - - **2.00**



No. **3950.**

No. **3955.**

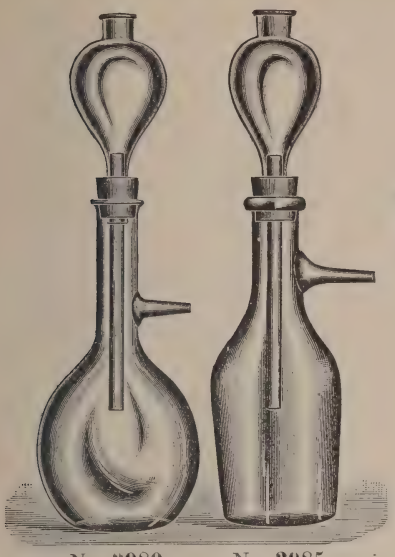
No.		Price.
3950.	**Novy's Apparatus, for Plate Cultures of Anærobes,** by either gas or pyrogallate method. Diameter of lower chamber 130 mm., height of lower chamber 130 mm., complete with two clamps and rubber band, each,	**$4.00**
3955.	**Novy's Apparatus, for Tube Cultures of Anærobes,** by either gas or pyrogallate method, large size 100 mm. inside diameter, for tubes up to 150 mm. long, each,	**2.50**
3960.	**Same as No. 3955,** but smaller, inside diameter 80 mm., for tubes 125 long, each,	**2.25**

The above apparatus is made after the designs of Dr. F. G. Novy, University of Michigan, Ann Arbor, Mich., and is described in *Centralblatt für Bakt. und Parasitenkunde XVI. Band, 1894, No. 14.* The Plate Apparatus is used as follows:

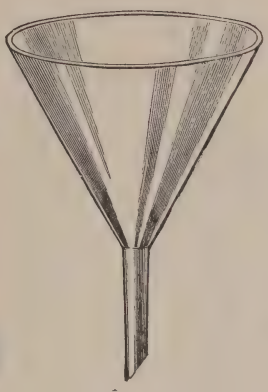
The inoculated Petri or Pasteur plates are stacked in the lower portion of the jar with covers in place. The ground surfaces of the appartatus are then smeared with a mixture consisting of one part bee's wax and four parts olive oil, the top placed in position and slightly rotated in order to expel all air bubbles from between the surfaces. An elastic band is slipped over the joint to further insure perfectly air tight fitting. The flanges are compressed by two clamps with rubber faced jaws. The stopper is turned open and gas from a Kipp's Hydrogen generator passed through the chamber for about an hour, when a half turn of the stopper hermetically seals the jar. It may then be disconnected from the generator, placed in the incubator and the growth of the colonies watched without difficulty. The usual method of making hydrogen for this purpose is to generate the gas in a Kipp's apparatus, using granulated zinc and Commercial Sulphuric Acid, purifying the gas by passing it through a Drechsel's Flask containing a 6% solution of Potassium Permanganate. The above apparatus may also be used for other gases,—Carbon Dioxide, Marsh Gas, Illuminating Gas, etc.

For the Pyrogallate method, a shallow dish containing the proper amount (2-3-5 grams) of Pyrogallic-Acid is placed in the bottom of the chamber, the culture dishes being supported upon it by means of a strip of glass. The top with stop cock closed is placed in position so that only a small opening remains, and about 25 cc. of a $\frac{1}{4}$ solution of Potash is introduced into the acid dish. The apparatus is then quickly closed and clamped. The tube apparatus is used in the same manner as the plate apparatus, except that the test tubes are inserted through the top.

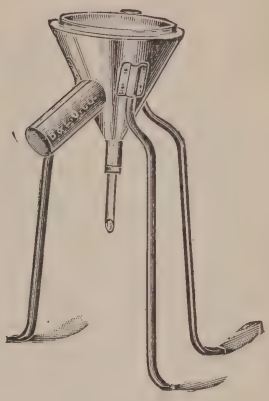
3965.	**Clamps,** with rubber lined jaws, for Novy's Plate Apparatus, each,	**.25**
3970.	**Rubber Bands,** for Novy's Plate Apparatus, each,	**.15**



No. 3980. No. 3985.



No. 3995.



No. 4005.

No. | Price.

3980. **Kitasato's Filter,** capacity of receiver 1000 cc., complete, each, - - **$2.25**

3985. **Chamberland's Filter,** capacity of receiver 1000 cc., complete, each, - **2.25**

These filters are after the most approved pattern, consisting of a glass container for the fluid to be filtered, a heavy filtering flask, with side neck for connecting with the exhaust pump, to receive the sterile fluid, and an unglazed porcelain tube through the walls of which the fluid is filtered. The receiver has a nozzle-shaped extremity below, to which the filter tube is attached by heavy rubber tubing. Filter pump No. 4025 is suitable for use with these filters.

3990. **Filter Tubes,** of porcelain, for the Chamberland or Kitasato's Filter, each **$ .25,** per dozen, - - - - - - - - - - **2.50**

3995. **Glass Funnels,** of clear white glass, heavy, and with tube ground to a bevel.

Diameter, mm.,	50	80	120	150	170	200
Capacity, cc.,	70	130	350	600	1200	1800
Price, each,	**$ .10**	**.14**	**.18**	**.24**	**.35**	**.50**
Per dozen,	**1.00**	**1.40**	**1.80**	**2.40**	**3.50**	**5.00**

4000. **Hot Water Funnels,** consisting of conical copper water chamber, supported by a circular Bunsen burner, and in which a glass funnel of 150 mm. diameter is placed, adjustable for height; complete, with stand, - - - - **4.00**

4005. **Hot Water Filter,** supported on three legs and with water chamber for heating from the side; each, - - - - - - - - - **4.00**

4010. **Separatory Funnel,** 60°, of clear white glass with cock.

Diameter, mm.,	100	180	240
Price, each, -	**$1.50**	**2.00**	**3.00**

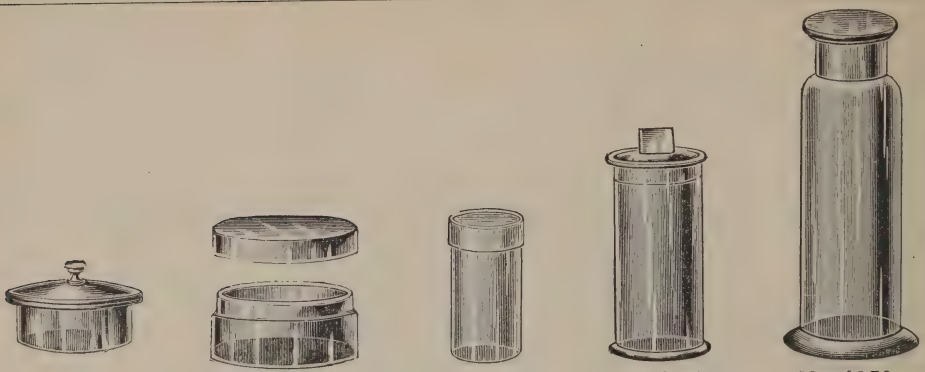
4015. **Funnel Tube,** straight, with conical top.

Length, mm.,	200	300	400
Price, each,	**$.10**	**.12**	**.15**

4020. **Funnel Tube,** straight, with thistle-shaped top.

Length, mm.,	200	300	400
Price, each,	**$.10**	**.12**	**.15**

4025. **Filter Air Pump,** all brass, to be attached to water tap for use with Katasato's and Chamberland's filters for rapid filtration by vacuum; will work well where ordinary water pressure can be had, each, - - - - - **1.50**



No. 4050. No. 4055. No. 4060. No. 4065. No. 4070.

No.

4050. Preparation Dish, of clear white glass, with broad flange at top and cover ground so as to fit on the flange perfectly air tight. A most desirable dish for temporary preservation of specimens, fixing, hardening, etc.

Height in mm.,	30	30	35	40
Diameter in mm.,	50	65	90	105
Price, each,	**$.40**	**.50**	**.75**	**1.00**

4055. Preparation Dish, of clear white glass with glass cover fitting loosely over the top. While not perfectly air-tight, the deep rim of the cover renders the dish sufficiently so for most purposes, and the moderate cost commends it still further.

Diameter, mm.,	50	60	70	90	105
Price, each,	**$ .20**	**.24**	**.28**	**.32**	**.40**
Per dozen,	**2.00**	**2.40**	**2.80**	**3.20**	**4.00**

4060. Cylinder Jars, of clear white glass, flat bottoms and plain ground rim. The cover fits loosely over the top of the jar. Used in European bacteriological laboratories for containing living cultures in tubes and for storing same. A very useful jar for general purposes.

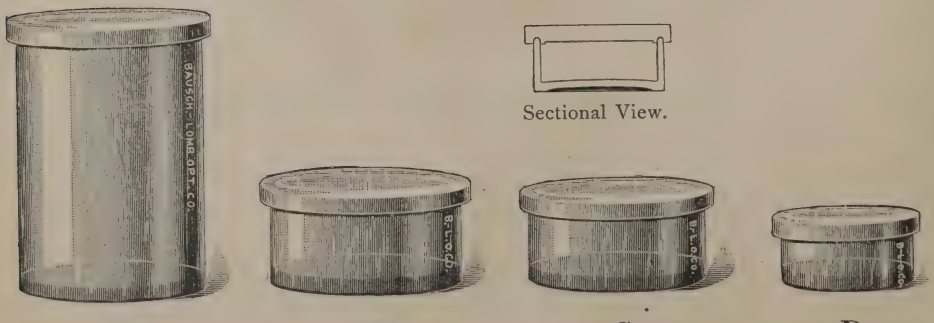
Height, mm.,	130	180	180
Diameter, mm.,	65	80	100
Price, each,	**$.45**	**.60**	**.75**

4065. Specimen Jars (also used for blood serum), of clear white glass, free from imperfections, with foot and lip, cover with knob, and each carefully ground air-tight into its jar. Each cover has a number corresponding to number on the jar cut in the glass.

Height, mm.,	100	130	150	180
Diameter, mm.,	75	75	100	120
Price, each,	**$ .50**	**.65**	**.80**	**1.20**
Per dozen,	**5.00**	**6.50**	**8.00**	**12.00**

4070. Preparation Jars, with neck and foot and ground glass stopper, of clear white glass.

Height, mm.,	80	100	120	150	180	200
Diameter, mm.,	30	30	40	50	60	80
Price, each,	**$ .25**	**.30**	**.35**	**.45**	**.55**	**.75**
Per dozen,	**2.50**	**3.00**	**3.50**	**4.50**	**5.50**	**7.50**



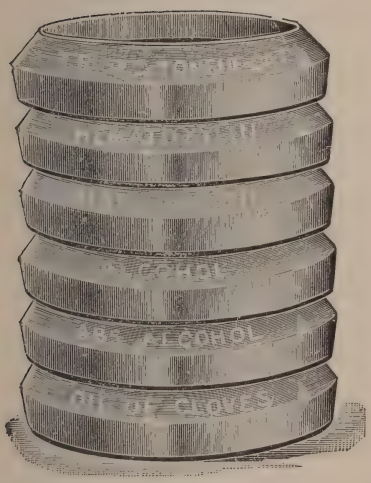
Sectional View.

A. **B.** **C.** **D.**

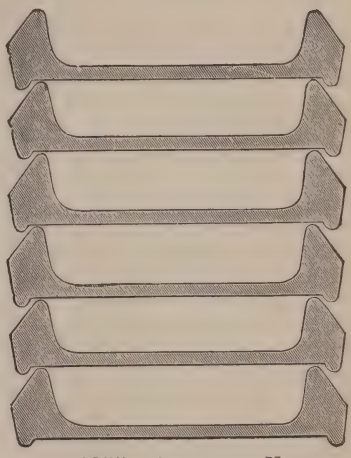
STENDER DISHES.—No. **4075.**

4075. Stender Dishes, of clear white glass, free from imperfections. These dishes are straight-walled and with the top surface accurately ground into a groove in the cover, making an air-tight fit as shown in the figure. As these dishes are made especially for us, we guarantee them to have accurately fitted covers and superior to the Stender dishes ordinarily sold.

	A	B	C	D
Height, mm.,	80	55	46	30
Diameter, mm.,	34	25	25	12
Price, each,	$ .22	.20	.18	.15
Per dozen,	2.40	2.15	2.00	1.75



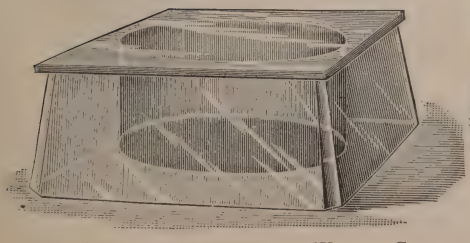
No. 4255.—Syracuse Watch Glasses.



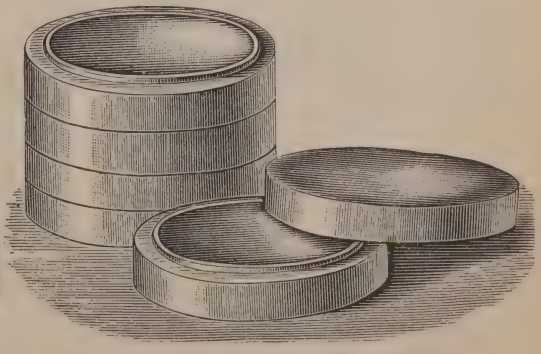
No. 4255.—Sectional View.

No.		Price.
4250.	**Syracuse Solid Watch Glasses,** improved form, plain, outside diameter 65 mm., inside diameter 50 mm., depth 10 mm., per dozen, - - - - -	$ .75
4255.	**Syracuse Solid Watch Glasses,** improved form, with beveled surface ground forming a writing surface upon which particulars about the contents may be written and erased easily, outside diameter 65 mm., inside diameter 50 mm., depth 10 mm., per dozen, - - - - - - - - - -	1.25

The improved Syracuse Watch Glass is of the most convenient form to be handled with least danger of dropping and will stand more hard usage without breaking or chipping than any other form The bottom surfaces are parallel, making it possible to examine objects in the glass without distortion, at the same time the slight curvature around the inside of the bottom permits the easy use of the section lifter. The flange around the bottom permits the glasses being securely stacked.



No. 4265.—Embryological Watch Glass.



No. 4287.—Porcelain Dishes.

4260. **Embryological Watch Glass,** with cover, upper and lower surface *not* ground and polished, one vertical surface ground for writing upon, per dozen, - - **$ .75**

4265. **Embryological Watch Glass,** with cover, upper and lower surfaces cut and polished, one vertical surface ground for writing upon, per dozen, - - **2.00**

4270. **Embryological Watch Glass,** of black glass, with cover, each, - - **.50**

These Watch Glasses are extensively used, and are recommended by Prof. J. E. Reighard, of the Morphological Laboratory of the University of Michigan. They will be found useful for all sorts of embryological material as well as for smaller invertebrates. The bottom is more nearly plane and is thinner than in the glasses hitherto in use. Such a bottom does not refract the light greatly and has the further advantage that flat objects lie upon it without distortion. The glass is well adapted for use on the microscope stage; the rectangular form enables it to be grasped readily by the fingers; it is small enough to be moved about on the stage and it is steady. Size, same as shown in cut above. A glass cover accompanies each one.

4275. **Watch Crystals,** with concave centers, and with small facet on bottom, per doz., **.60**

4280. **Watch Glasses,** thin, concave, with flat bottoms, German form.

Diameter in mm., - - -	40	50	70
Each, - - - -	**$ .08**	**.10**	**.12**
Per dozen, - - - -	**.80**	**1.00**	**1.20**

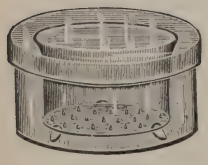
4285. **Standard for Syracuse Solid Watch Glasses,** adapted for a nest of six or less, each, - - - - - - - - - - **.50**

4287. **Porcelain Mounting Dishes,** in nests of five, with cover. These dishes are for staining, etc., of sections. The dishes fit upon each other tightly, one forming a cover for another.

Diameter in mm., - -	64	72	84	96
Price, per nest, -	**$ .60**	**.70**	**.80**	**1.00**

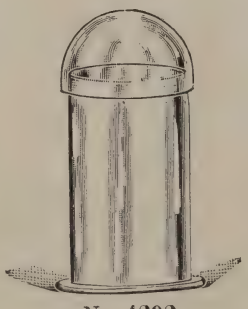
4288. **Porcelain Mounting Dishes,** deeper than No. 4287, otherwise like them; in nests of three.

Diameter in mm., - - -	70	80	100
Price, per nest, - -	**$1.25**	**1.50**	**1.75**



No. **4290.**

No. **4291.**



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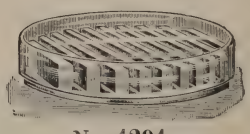


No. **4294.**

No. Price.

4290. **Steinach's Staining and Reagent Dish,** complete, each, - - - **$1.25**

This dish consists of an inner glass vessel supported on glass feet and with the bottom perforated, contained in a heavy outer dish with top ground on air tight. The sections are placed in the sieve dish and may be lifted out permitting the changing of reagents without folding, tearing or loosing sections. Diameter of outer dish 75 mm.

4291. **Staining Tubes,** with glass stopper ground in air tight, for staining, clearing, fixing, etc., on the slide. The two sizes are for slides 75 x 25 and 75 x 50 mm. respectively.

Height mm.,	120	120
Diameter in mm.,	30	50
Price, each,	**$ .50**	**.60**
Per dozen,	**5.00**	**6.00**

4292. **Naples Staining and Reagent Jar,** straight glass tube with heavy glass base to prevent overturning, hemespherical glass cover, covers interchangeable. Extremely practical for staining, fixing, clearing, etc., on the slide. Originally used in Naples Marine Biological Laboratory and in Marine Biological Laboratory, Woods Holl, Mass. Height, without cover, 90 mm., diameter 35 mm., each, **$ .20,** per dozen, - - - - - - - - - - - **$2.00**

4293. **Naples Staining and Reagent Jar,** same as above, but fitted with cork stopper instead of glass caps, each, **$ .16,** per dozen, - - - - - - **1.60**

4294. **Slide and Cover Glass Staining Dish,** each, **$ .75,** per set of six, - - **4.00**

This dish is a modification of a dish used by Dr. V. A. Moore, of the Department of Agriculture, Washington, D. C., which was suggested by Dr. J. Melvin Lamb, of Howard University, Washington, D. C. The dish is for holding cover glasses or slides during hydration, staining, dehydration, etc., of sections. It consists of a double dish 110 mm. in diameter and 30 mm. deep, inside of which a glass disc is placed, the disc having nine parallel ridges separated by spaces 6 mm. wide. The slides or cover glasses are placed on edge between the ridges, against which they rest. A reservoir of the above size will hold, without crowding, 30 18 mm. covers, or 6 slides 75 x 25 mm. It is desirable to have a dish for each of the liquids.

This dish is not only very convenient but is economical of reagents, the heavy glass disc taking up the space in the dish not needed for the glasses.

4295. **Staining Plate,** 160 x 130 mm. with 12 cavities for stains, etc., of porcelain, especially useful in staining germs, each, - - - - - - **.60**

a *b* *c* *d* *e*

No. **4296.** No. **4297.**—One half actual size.

4296. **Embryo Jars,** blown from glass tubing, extra quality, capacity 15 cc., per dozen with cork stopper, - - - - - - - - - **1.00**

4297. **Glass Stoppered Preparation Vials,** microscopic preparations preserved in osmic acid or other reagents which attack cork and rubber stoppers should be preserved in these vials.

Size,	*a*	*b*	*c*	*d*	*e*
Capacity, grams,	8	6	4	3	2
Per dozen,	**1.25**	**1.00**	**.75**	**.60**	**.50**

No. **4300.** No. **4315.** No. **4320.** No. **4325.** No. **4330.**

No.

4300. Tube Vials, of clear white glass, with flat bottom and without neck, with cork stoppers.

Height in mm.,	25	35	40	50	60	70	80	50	60	70	80
Diameter in mm.,	8	8	10	12	13	15	16	25	25	25	25
Per dozen,	**$ .11**	**.15**	**.18**	**.20**	**.25**	**.30**	**.35**	**.40**	**.50**	**.60**	**.75**
Per gross,	**1.20**	**1.50**	**1.80**	**2.00**	**2.50**	**3.00**	**3.50**	**4.00**	**5.00**	**6.00**	**7.50**

4305. Tube Vials, of amber glass, flat bottoms, without neck, with cork stoppers.

Height in mm.,	28	35	45	55	65	65	95	77
Diameter in mm.,	8	8	10	12	14	18	18	26
Per dozen,	**$ .15**	**.20**	**.25**	**.30**	**.35**	**.40**	**.50**	**.75**
Per gross,	**1.50**	**2.00**	**2.50**	**3.00**	**3.50**	**4.00**	**5.00**	**7.50**

4310. Homœopathic Vials, short style, straight, flat bottom, with neck and with cork stoppers.

Capacity in grams,	1	2	3	4	5
Per dozen,	**$ .12**	**.15**	**.18**	**.24**	**.30**
Per gross,	**1.20**	**1.45**	**1.75**	**2.25**	**3.00**

4315. Narrow Mouth Flint Glass Bottles.

Capacity in cc.,	15	30	50	75	100	150	250	375	500	1000
Each,	**$ .03**	**.04**	**.05**	**.06**	**.08**	**.10**	**.12**	**.15**	**.18**	**.20**
Per dozen,	**.20**	**.25**	**.30**	**.35**	**.40**	**.45**	**.55**	**.70**	**.90**	**1.25**
Per gross,	**2.00**	**2.25**	**2.75**	**3.25**	**3.75**	**4.25**	**5.00**	**6.75**	**8.50**	**12.00**

4320. Wide Mouth Flint Glass Bottles.

Capacity in cc.,	15	30	50	75	100	150	250	375	500	1000
Each,	**$ .04**	**.05**	**.06**	**.08**	**.10**	**.12**	**.15**	**.18**	**.20**	**.24**
Per dozen,	**.25**	**.30**	**.35**	**.40**	**.45**	**.55**	**.70**	**.90**	**1.20**	**1.50**
Per gross,	**2.25**	**2.50**	**3.00**	**3.50**	**4.00**	**4.50**	**5.50**	**7.25**	**9.00**	**13.00**

No. Price.

4325. Narrow Mouth Flint Glass Bottles, with glass stopper.

Capacity in cc.,	15	30	50	75	100	150	250	375	500	1000
Each,	$ .10	.12	.14	.16	.18	.20	.24	.28	.32	.40
Per dozen,	.90	1.00	1.15	1.30	1.50	1.75	2.00	2.25	3.00	3.25
Per gross,	8.25	8.75	10.00	11.25	13.00	14.75	16.75	21.25	26.00	36.00

4330. Wide Mouth Flint Glass Bottles, with glass stopper

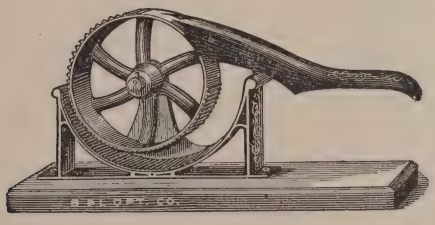
Capacity in cc.,	15	30	50	75	100	150	250	375	500	1000
Each,	$ .12	.14	.16	.18	.20	.24	.28	.32	.40	.50
Per dozen,	1.00	1.15	1.30	1.50	1.75	2.00	2.25	2.50	3.25	4.00
Per gross,	9.00	9.50	10.75	12.00	14.00	16.00	18.00	22.50	28.00	39.00

4332. Cork Stoppers, best quality, short.

Length,	13	13	13	13	13	16	16	19	19	25	25
Diam. at Top,	9	10	11	12	14	16	18	20	22	24	26
Price, per doz.,	$.04	.04	.05	.06	.07	.08	.11	.13	.15	.20	.25
Per gross,	.40	.40	.44	.52	.60	.72	1.08	1.24	1.36	1.96	2.40

4334. Cork Stoppers, best quality, long.

Lgth.,	15	18	20	20	22	22	24	24	26	30	34	34	34	38	38	38	38
Diam.,	10	11	12	14	16	18	20	22	24	26	28	30	32	35	42	47	50
Doz.,	.05	.05	.06	.07	.08	.10	.14	.18	.20	.25	.27	.30	.33	.37	.55	.98	1.15
Gross,	.50	.50	.55	.65	.75	.95	1.35	1.70	2.00	2.50	2.70	2.95	3.30	3.65	5.20	7.75	11.25



4335. Cork Press, Rotary, taking all sizes up to 45 mm., each, - - - $ .65

4336. Cork Borers, set of three, - - - - - - - - .75

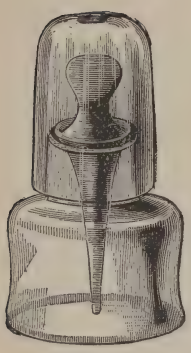
4337. Cork Borers, set of six, - - - - - - - - 1.00

4338. Cork Borers, set of nine, - - - - - - - - 1.50

4339. Cork Borer Sharpener, - - - - - - - - 1.00

4340. Cork Files, special cut, with fine points for perforating corks.

Length,	- - 75	100	125	150	200 mm.
Price, each,	- $ .12	.15	.20	.25	.35



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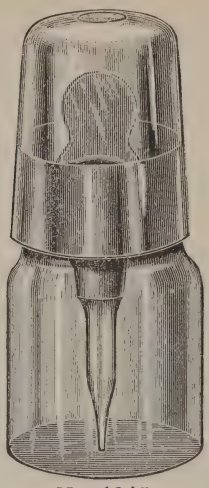

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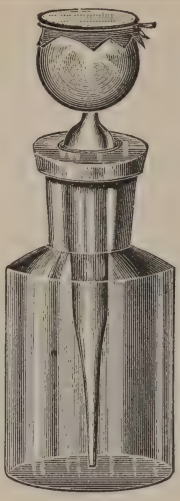

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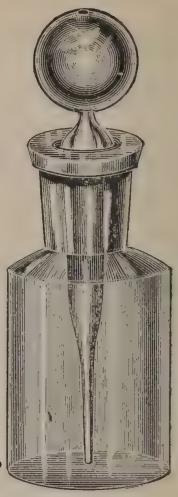


No. 4360.

No. | Price.

4340. **Balsam Bottle,** with glass balsam dropper fitting loosely in the neck of the bottle and with glass cap ground on; 45 cc. capacity; each, **$ .25,** per dozen, - **$2.50**

4345. **Balsam Bottle,** with triangular glass balsam dropper touching neck of bottle only in three points to prevent gumming, with glass cap ground on; capacity 30 cc.; ea., **.35**

4350. **Balsam Bottle,** same as No. 4350, but 60 cc. capacity; each, - - - **.50**

4355. **Dropping Bottle,** with pipette stopper, 30 cc. capacity; each, - - - **.25**
The amount of fluid ejected from pipette is controlled by pressure on the rubber top of bulb.

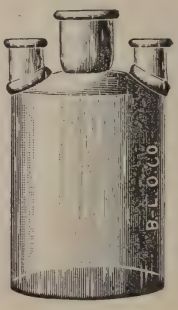
4360. **Dropping Bottle,** with pipette stopper, 30 cc. capacity; each, - - - **.20**
The glass bulb at the top of the pipette is perforated and the amount of fluid flowing from the pipette is controlled by the finger on the small hole.

4362. **Dropping Bottle,** with Barnes pipette, 30 cc. capacity, each, **$ .10,** per dozen, **.85**
The pipette in this bottle acts as a stopper for the bottle in which it is placed. It is a very convenient and inexpensive bottle for stains in laboratory work.

No. 4362.

No. 4365.

No 4380.



No. 4390.

4365. **Dropping Bottle,** with pipette stopper having rubber bulb, 30 cc. capacity; each, **$ .20,** per dozen, - - - - - - - - - - **2.00**

4367. **Dropping Bottle,** same as No. 4365, without rubber bulb, each, **$ .18,** per doz., **1.75**

4370. **Dropping Bottle,** same as No. 4365, but 50 cc. capacity, each, **$ .25,** per doz., **2.50**

4372. **Dropping Bottle,** same as No. 4367, but 50 cc. capacity, each, **$ .22,** per doz., **2.25**

5375. **Dropping Bottle,** with ground glass stopper, capacity 30 cc., each, **$ .20,** per doz., **2.00**
Cavities in the stopper permit the fluid to escape drop by drop. A half turn of the stopper closes the bottle hermetically. Very convenient for volatile or hygroscopic reagents.

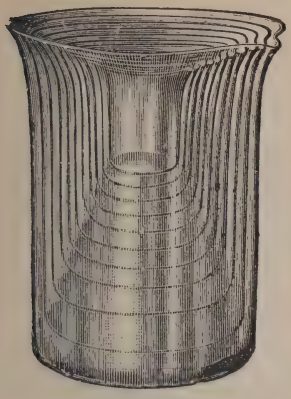
4380. **Reagent Stock Bottle,** 500 cc. capacity; each, **$ .60,** per doz., - - **6.00**
This bottle is especially intended for keeping the stains and other stock reagents which are to be distributed to individuals in the laboratory. A detachable glass funnel is ground into the neck and serves as a pour-out, and may be removed for filling the bottle. A glass cap ground on the large outer rim of the neck prevents evaporation.

4385. **Woulff Bottle,** with two necks.

Capacity in cc.,	250	500	1000
Price, each,	**$.45**	**.50**	**.85**

4390. **Woulff Bottle,** with three necks.

Capacity in cc.,	250	500	1000
Price, each,	**$.50**	**.60**	**1.00**



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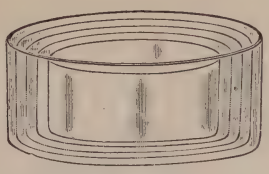


No. 4410.

No. 4425.

No. 4430.

No. 4435.

No. | Price.

4395. **Beaker Glasses,** Griffin's low form, with lip. These beakers are the best quality Bohemian glass and are properly annealed for heating, etc.

Size,	1	2	3	4	5	6	7
Height mm.,	55	65	75	85	98	108	120
Diam. at bottom mm.,	35	40	45	51	58	65	72
Capacity cc.,	30	60	120	150	225	300	400
Price, each,	**$ .12**	**.14**	**.16**	**.18**	**.20**	**.25**	**.30**
Per dozen,	**1.20**	**1.40**	**1.60**	**1.80**	**2.00**	**2.50**	**3.00**

4400. **Nested Beaker Glasses,** Griffin's low form, with lip, sizes 1, 2, 3, 4, per nest, **$ .60**

4401. **Nested Beaker Glasses,** Griffin's low form, with lip, sizes 1, 3, 4, 5, per nest, **.80**

4402. **Nested Beaker Glasses,** Griffin's low form, with lip, sizes 1, 2, 3, 4, 5, 6, per nest, **1.00**

4403. **Nested Beaker Glasses,** Griffin's low form, with lip, sizes 1,2,3,4,5,6,7, per nest, **1.30**

4410. **Crystalization Dishes,** of clear white glass, with straight sides, flat bottom, and polished edges. Very useful also for use as small aquaria in Botanical and Zoological laboratories.

Height in mm.,	54	58	62	66	70
Diameter in mm.,	110	130	150	170	190
Price, each,	**$ .30**	**.35**	**.40**	**.45**	**.50**

4425. **Evaporating Dishes,** of best Bohemian glass, round bottom and with pour out.

Size,	1	2	3	4	5	6	7
Diameter in mm.,	50	60	80	100	120	140	160
Price, each,	**$ .15**	**.20**	**.25**	**.30**	**.40**	**.45**	**.50**
Per dozen,	**1.50**	**2.00**	**2.50**	**3.00**	**4.00**	**4.50**	**5.00**

4426. **Evaporating Dishes,** No. 4425, glass with round bottom and with pour out, nested, Nos. 1, 2, 3, 4, per nest, **.90**

4427. **Evaporating Dishes,** No. 4425, glass, with round bottom and with pour out, nested, Nos. 1, 2, 3, 4, 5, per nest, **1.25**

4428. **Evaporating Dishes,** No. 4425, glass, with round bottom and with pour out, nested, Nos. 1, 2, 3, 4, 5, 6, per nest, **1.60**

4429. **Evaporating Dishes,** No. 4425, glass, with round bottom, and with lip and pour out, nested, Nos. 1, 2, 3, 4, 5, 6, 7, per nest, **2.00**

4430. **Porcelain Evaporating Dishes,** of best ware.

Capacity cc.,	15	35	50	80	120	150	200	300	400	500
Price, each,	**$ .12**	**.15**	**.18**	**.20**	**.25**	**.30**	**.35**	**.40**	**.45**	**.50**
Per dozen,	**1.20**	**1.50**	**1.80**	**2.00**	**2.50**	**3.00**	**3.50**	**4.00**	**4.50**	**5.00**

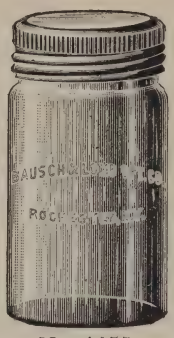
4435. **Casseroles,** Porcelain, without covers and with porcelain handles.

Capacity,	100	125	250	500	750	1000 cc.
Price, each,	**$ .30**	**.40**	**.50**	**.70**	**.90**	**1.15**

4440. **Casseroles,** Porcelain, with covers and with porcelain handles.

Capacity,	100	125	250	500	750	1000 cc.
Price, each,	**$ .40**	**.50**	**.60**	**.80**	**1.00**	**1.25**

No. **4450.**



No. **4455.**

No. **4460.**

4450. Wash Bottles, with glass tubes and rubber stopper.

Capacity,	150	250	500	1000 cc.
Price, each,	**$ .25**	**.30**	**.40**	**.50**
Per dozen,	**2.75**	**3.40**	**4.50**	**5.60**

4455. Preservation Jars, of clear white glass, with glass cover fitting air tight with rubber ring, and held in place with metal flange which screws down upon the cap. This form of jar is used by the U. S. Fish Commission and many institutions, for collecting and preserving museum specimens and anatomical material.

Capacity,	500	1000	2000 cc.
Price, each,	**$ .16**	**.20**	**.25**
Per dozen,	**1.60**	**2.00**	**2.50**

4460. Preservation Jars, with self-acting clamp, of clear white glass, body of jar same size as mouth. The cover is of glass, fitting air tight with rubber band and clamped with spring-clamp as shown in figure. An extremely handy collecting and preservation jar.

Capacity,	250	335	500	750 cc.
Price, each,	**$ .10**	**.14**	**.16**	**.20**
Per dozen,	**1.00**	**1.35**	**1.60**	**2.00**

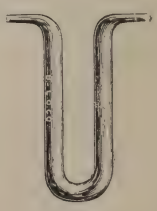
No. **4465.**

No. **4470.**

No. **4475.**

No. **4480.**

No. **4485.**



No. **4490.**

4465. Connecting Tubes, three way, of glass, T shape.

Length,	25	40	50	65	90 mm.
Diameter,	6	7	9	11	12 mm.
Price, each,	**$ .10**	**.12**	**.14**	**.16**	**.18**

4470. Connecting Tubes, three way, of glass, Y shape.

Length,	25	40	50	65	90 mm.
Diameter,	6	7	9	11	12 mm.
Price, each,	**$ .10**	**.12**	**.14**	**.16**	**.18**

4475. Connecting Tubes, three way, of glass, U shape.

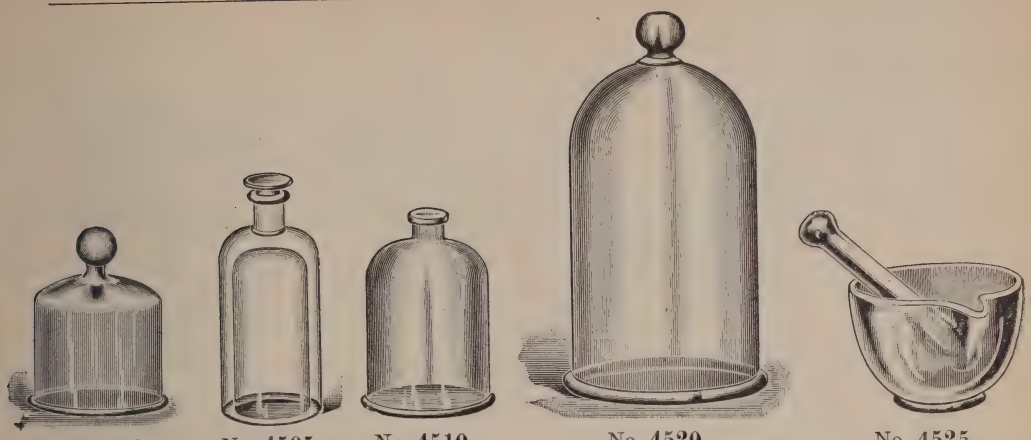
Length,	25	40	50	65	90 mm.
Diameter,	6	7	9	11	12 mm.
Price, each,	**$ .10**	**.12**	**.14**	**.16**	**.18**

4480. Drying Tubes, Marchand's, of glass.

Length,	150	200	250	300 mm.
Diameter,	15	20	22	25 mm.
Price, each,	**$ .30**	**.40**	**.50**	**.60**

4485. Drying Tubes, Bank's, of glass.

Length,	100	140	180 mm.
Diameter,	13	16	18 mm.
Price, each,	**$ .25**	**.30**	**.40**



No. 4500. No. 4505. No. 4510. No. 4520. No. 4525.

4490. Drying Tubes, Hart's, of glass.

Length,	120	140	180	220 mm.
Diameter,	13	16	18	20 mm.
Price, each,	**$ .28**	**.32**	**.40**	**.50**

4500. Bell Jar, low, of heavy clear white glass, straight sides, with knob and ground lip.

Height without knob,	80	105	130	180	235 mm.
Diameter,	80	105	130	155	185 mm.
Price, each,	**$.50**	**.65**	**.80**	**1.25**	**2.00**

4505. Bell Jar, double walled, for physiological work.

The jar may be filled with colored fluid acting as a ray filter for determining the effect of various rays on plant functions, etc.

Height,	300	400 mm.
Diameter,	120	150 mm.
Price, each,	**$4.50**	**6.00**

4510. Bell Jar, open top, of clear white glass with ground lip.

Height,	155	170	180	200	300 mm.
Diameter,	50	90	100	150	200 mm.
Price, each,	**$.60**	**.80**	**1.00**	**1.50**	**2.50**

4515. Bell Jar, with glass stopper, of clear white glass with ground lip.

Height,	155	170	180	200	300 mm.
Diameter,	50	90	100	150	200 mm.
Price, each,	**$.85**	**1.20**	**1.50**	**2.00**	**3.00**

4520. Bell Jar, for covering microscope, heavy, with knob and ground lip.

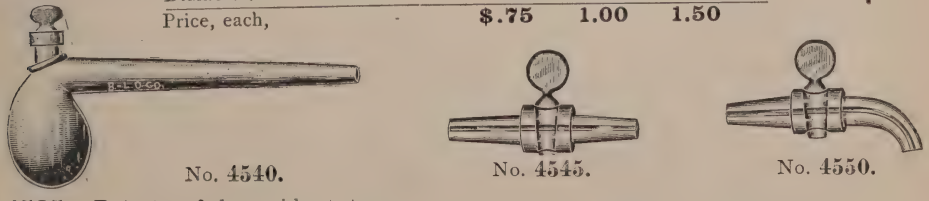
Height,	350	425 mm.
Diameter,	200	225 mm.
Price, each,	**$2.50**	**3.50**

4525. Glass Mortar, with pestle, of heavy glass, very strong.

Diameter.	100	150	200 mm.
Price, each,	**$.60**	**.85**	**1.20**

4530. Porcelain Mortar, with pestle, heavy, of best quality porcelain.

Diameter.	100	150	200 mm.
Price, each,	**$.75**	**1.00**	**1.50**



No. 4540. No. 4545. No. 4550.

4535. Retorts, of glass, without stopper.

Capacity,	75	150	250	500 cc.
Price, each,	**$.15**	**.20**	**.25**	**.35**

4540. Retorts, of glass, with ground glass stopper.

Capacity.	75	150	250	500 cc.
Price, each,	**$.25**	**.30**	**.45**	**.60**

4545. Stop Cock, glass, straight, 80 mm. long, each, **$1.25**

4550. Stop Cock, glass, bent, 80 mm. long, each, **1.25**

4555. Stop Cock, brass, both ends for tubing.

Diameter of bore.	4 mm.,	8 mm.
Price, each,	**$.65**	**.75**

No. Price.

4560. **Glass Tubing** of soft glass especially for melting and blowing for laboratory work. Tubing comes regularly in lengths of about 1½ meters.

Sizes in stock as follows:

Outside diameter, mm.,	2.0	3.0	4.0	5.0	8.0	11.0	14.0	16.0	19.0	22.0	25.0	32.0	38.0	44.0	50.0
Thickness of wall, mm.,				1.5	1.5	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.8	3.0	3.0
Price, per pound,	**$.75**	**.75**	**.75**	**.50**	**.50**	**.50**	**.50**	**.50**	**.50**	**.50**	**.50**	**.65**	**.60**	**.60**	**.60**

4565. **Glass Rod,** of soft glass easily melted, for laboratory use.

Diameter in mm.,	2	4	6	8	10	12
Price, per pound,	**$.50**	**.50**	**.50**	**.50**	**.60**	**.60**

4566. **Stirrers** of glass rod, per dozen, - - - - - - - **.60**

4567. **Inoculators,** glass rod with platinum wire fused in, each **$ .30,** per dozen, **3.00**

4570. **Pipettes,** with rubber bulb, straight, each **$ .05,** per dozen, - - - **$ 50**

4571. **Pipettes,** with rubber bulb, curved, each **$ .05,** per dozen, - - **.50**

4572. **Pipettes,** straight, with large mouth and extra large bulb, for egg work, etc., each **$ .10,** per dozen, - - - - - - - - **.75**

4573. **Pipettes,** funnel top for finger, 90 mm. long, straight, each, **$ .05,** per dozen, **.50**

4574. **Pipettes,** funnel top for finger, 90 mm. long, curved, each, **$ .05,** per dozen, **.50**

4575. **Pipettes,** straight, 200 mm. long, without bulb, each **$ .10,** per dozen, - **1.00**

4580. **Pipettes,** straight, 200 mm. long with 20 cc. pure gum bulb, each, - - **.30**

4585. **Pipettes,** straight, 300 mm. long, without bulb, each **$ .15,** per dozen, - **1.50**

4590. **Pipettes,** straight, 300 mm. long, with 20 cc. pure gum bulb, each, - **.30**

4595. **Glass Plates,** for covers, square, ground edge.

Size in mm.,	120 x 90	130 x 80	130 x 100
Price, each, - -	**$ .10**	**.12**	**.15**
Per dozen, - -	**1.00**	**1.20**	**1.50**

4600. **Glass Plates,** for covers, square, edges not ground.

Size in mm.,	120 x 90	130 x 80	130 x 100
Price, each,	**$ .08**	**.10**	**.12**
Per dozen, - -	**.75**	**1.00**	**1.25**

4605. **Glass Plates,** for covers, circular, edges ground.

Diam. in mm.,	50	75	100	125.	150	175	200
Price, each,	**.10**	**.12**	**.15**	**.20**	**.30**	**.40**	**.50**
Per dozen,	**$1.00**	**1.20**	**1.50**	**2.00**	**3.00**	**4.00**	**5.00**

4610. **Glass Plates,** for covers, circular, edges not ground.

Diam. in mm.,	50	75	100	125	150	175	200
Price, each,	**$ .08**	**.10**	**.12**	**.15**	**.20**	**.30**	**.40**
Per dozen,	**.80**	**1.00**	**1.20**	**1.50**	**2.00**	**3.00**	**4.00**

No. **4620.**

No. **4625.**

No. **4630.**

No. Price.

4620. Agate Ware Cooking Pot, with retinned cover and patent bottom as above which prevents burning or scorching of contents.

Capacity cc.,	1000	3000	5000
Height mm.,	95	110	125
Diameter mm.,	145	200	225
Price, each,	**$ .75**	**1.00**	**1.25**

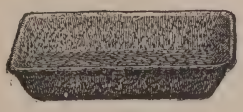
4625. Agate Ware Stew Pan, with retinned cover and patent bottom which prevents burning or scorching of contents and affords protection to that part of the vessel which receives the most wear.

Capacity cc.,	1000	3000	5000
Height mm.,	95	110	125
Diameter mm.,	145	200	225
Price, each,	**$ .75**	**1.00**	**1.25**

4630. Agate Ware Stew Pan, deep, with retinned cover.

Capacity cc.,	1000	3000	6000
Height mm.,	95	135	160
Diameter mm.,	125	165	215
Price, each,	**$ .50**	**.75**	**1.00**

No. **4635.**



No. **4640.**

No. **4645.**

No. **4650.**

4635. Agate Ware Waterbath Boiler. Each, **$2.00**

Capacity in cc. of inside boiler, 2500

4640. Agate Ware Trays, seamless.

Length mm.,	230	260
Width mm.,	155	200
Depth mm.,	45	50
Price, each,	**$ .50**	**.60**

These trays are very useful in laboratory work as they are perfectly safe to use with reagents, are easily cleaned, and are indestructible.

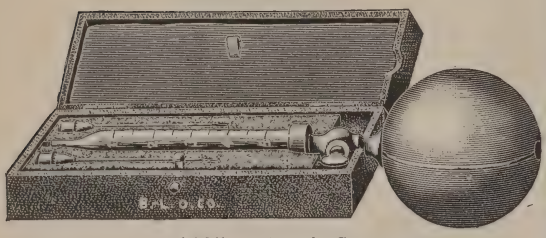
4645. Agate Ware Funnels.

Capacity cc.,	250	500	1000	2000
Price, each,	**$ .30**	**.40**	**.50**	**.60**

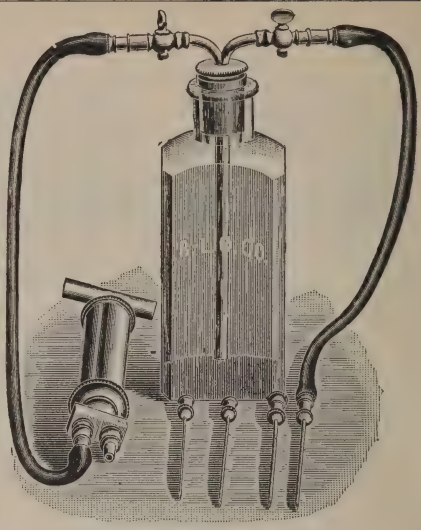
4650. Agate Ware Percolator.

Capacity cc.,	500
Diameter mm.,	115
Price, each,	**$ .50**

The dishes described above are of very great value in the laboratory as they are perfectly glazed with the agate preparation, and being entirely seamless, are much more easily kept clean than ordinary ware.



No. **4685.**—Koch's Syringe.



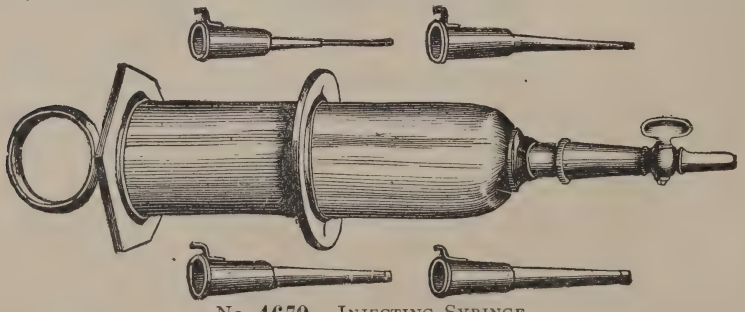
No. **4665.**—Injecting Syringe.

4655. **Hypodermic Syringe,** with finger rest attachment, 2 needles, with cleaner and vial, in leather case, - - - - - - - - - - - **$1.50**

4660. **Injecting Syringe,** 30 cc. capacity, two large and one small needles, tocar and two way stop cock, in case, - - - - - - - - - - **4.50**

4665. **Injecting Syringe,** with three needles and trocar, double stop cock fitted to rubber stopper and two pieces rubber tubing with accurately fitted joints, complete, in leather case, also 250 cc. glass bottle with metal attachment for holding the stopper, **12.00**

This syringe is designed for injecting fluids and hardening and killing reagents into vessels or tissues requiring larger quantities than the ordinary hypodermic syringe will contain. The barrel, which is nickeled inside and out, is fitted with a double packed plunger. The nozzle has automatic two way cock. Two pieces of rubber tubing with metal couplings, and a rubber stopper with the proper tubes in it are provided, also an 250 cc. glass bottle in which the injecting fluid is placed, and which has metal attachment on the neck which retains the stopper in position when air pressure is applied to force the fluid into the vessels. Two stop cocks give complete control of the fluid. As the injecting fluid is driven into the vessels by air forced into the bottle by the syringe, corrosive fluids may be used without injuring the syringe. There are four steel canulas, each 100 mm. long and 1.0, 1.8, 2.1 and 2.4 mm. in diameter respectively.



No. **4670.**—Injecting Syringe.

4670. **Injecting Syringe,** 20 cc. capacity, with detachable stop cock and four canulas with ligature catch, in leather case, - - - - - - - **8.00**

This syringe is of brass nickeled, and the canulas as now made are with parallel sided nozzles without the ball tip shown in cut.

4675. **Koch's Syringe,** 1 cc. capacity, in case with 2 extra needles, each, - - - **1.50**

4680. **Koch's Syringe,** 2 cc. capacity, in case with 2 extra needles, each, - - **2.00**

4685. **Koch's Syringe,** 5 cc. capacity, in case with 2 extra needles, each, - - - **2.50**

4690. **Pravaz Syringe,** 1 cc. capacity, in case with 2 extra needles, each, - - **.50**

4695. **Pravaz Syringe,** 2 cc. capacity, in case with 2 extra needles, each, - - - **.75**

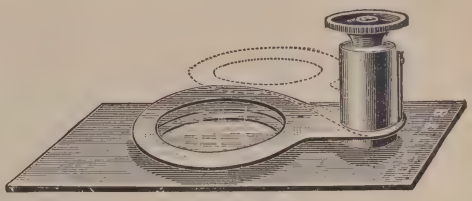
4700. **Pravaz Syringe,** 5 cc. capacity, in case with 2 extra needles, each, - - **1.00**

4705. **Extra Needles** for Hypodermic Syringe, No. 4655, each, - - - - **.10**

4706. **Extra Needles** for Koch's Syringe, each, - - - - - - - **.10**

4707. **Extra Needles** for Pravaz Syringe, each. - - - - - - - **.10**

No. **4750.**

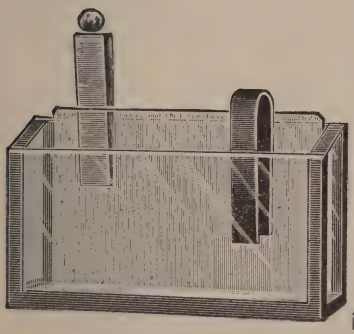


No. **4755.**

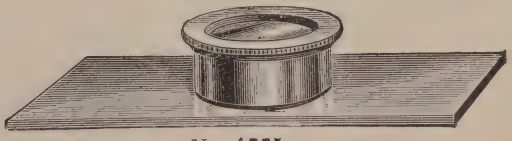
No.		Price.
4750.	**Wenham's Compressor,** each,	**$1.50**
4755.	**Parallel Compressor,** improved construction, each,	**3.50**

No. **4760.**—(Actual Size).

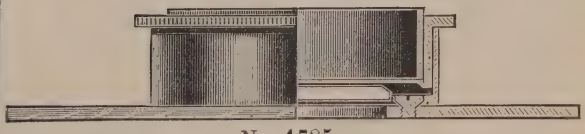
4760. Compressor, for examining flesh suspected of containing Trichinæ or other parasites. In use by U. S. Bureau of Animal Industry, each, **2.00**



No. **4770.**

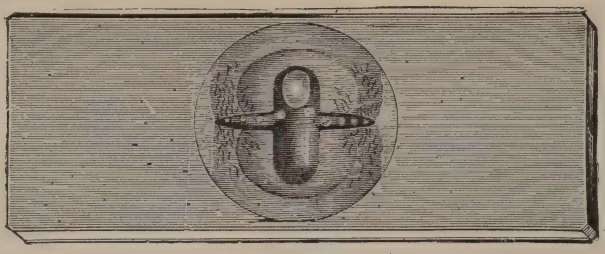


No. **4775.**



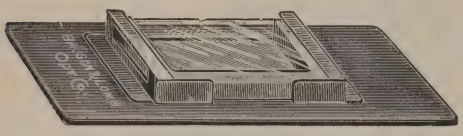
No. **4785.**

4765.	**Animalcule Cage,** small, of glass cemented to glass slide, 75 x 25 mm., each,	**.60**
4770.	**Animalcule Cage,** with wedge and spring, each,	**2.50**
4775.	**Life Box,** usual construction on brass slip, each,	**2.00**
4780.	**Life Box,** extra large, each,	**3.00**
4785.	**Life Box,** improved construction, each,	**2.50**
4790.	**Life Box,** with spiral slot for obtaining close adjustment without crushing specimens, each,	**3.50**
4795.	**Fish Trough,** for keeping small fish, etc., alive while examining circulation of blood, each,	**2.00**



No. 4805.

No.		Price.
4800.	**Holman's Life Slide,** with cover, in box, each,	**$1.50**
4805.	**Holman's Current Slide,** with cover, in box, each,	**1.50**
4810.	**Holman's Syphon Slide,** with cover and flexible tubes, no bottles, each,	**4.00**



No. 4815.

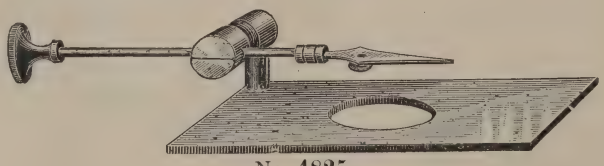
No. 4820.

4815. Stage Aquarium (after Dr. J. C. Cori), each, **3.00**

This acquarium is made from a strip of glass 8 mm. wide bent to the required shape, and having a piece of thin cover glass 30 x 40 mm. cemented to each side. As this is a standard size of cover glass, the sides are easily replaced if broken. The carrier for the aquarium consists of a brass plate 4 x 9 cm. fitted with L shaped guides within which the aquarium moves up and down, being firmly held by springs in the guides. The aquarium is useful not only for Zoölogical, but also for Botanical (Algæ studies, etc.), and Physiological purposes.

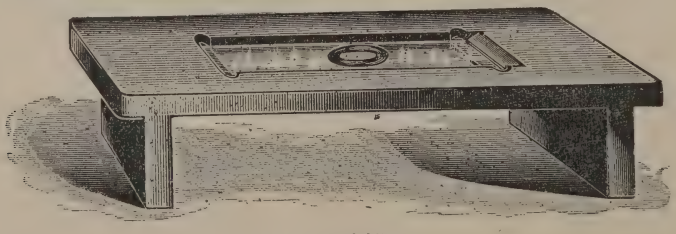
4820. Observation Slide, reversible (after Dr. J. C. Cori), each, **3.00**

Objects are mounted on a thin cover glass 30 x 40 mm. and covered by a smaller cover glass which is held in place by pieces of wax at the corners. This allows the mount to be of any thickness. The whole preparation is clamped in the brass frame and may then be examined from either side.



No. 4825.

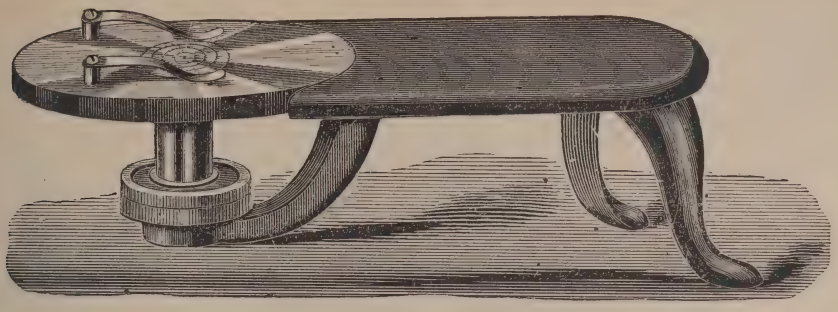
4825.	**Stage Forceps,** on slide, each,	**2.00**
4830.	**Stage Forceps,** three pronged, for holding minerals, etc., each,	**5.00**
4835.	**Mechanical Finger,** Dr. W. B. Rezner's, each,	**6.00**
4840.	**Maltwood Finder,** in case, each,	**4.00**



No. 4845.

4845. Mounting Table, Prof. J. M. Van Cott's, each, **.80**

The table is of metal neatly japanned and with mark showing center of slide. It greatly facilitates rapid and accurate mounting and affords a better view of the object during clearing, etc., than when slide is in contact with the work table.



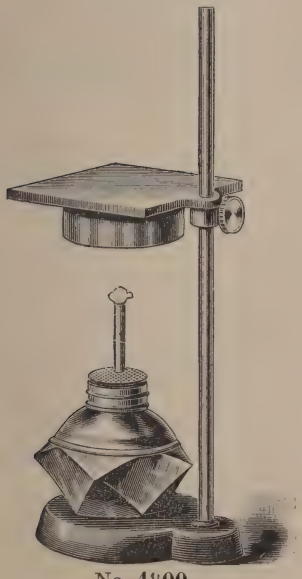
No. 4875.

No.		Price.
4875.	**Turn-Table "National,"** each,	**$2.50**
4880.	**Turn-Table "National,"** with detachable hand-rests, each,	**3.00**
4885.	**Turn-Table "National,"** centering, each,	**3.50**

The centering arrangement of this turn-table consists of three stops, against which the slide is placed and is held in position by the spring clips. Although not strictly centering, it is approximately so on the usual slide, and, for all ordinary purposes, quite efficient.

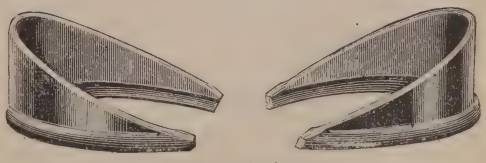
4887.	**Turn-Table "National,"** centering, with detachable hand-rests, each,	**4.00**
4890.	**Turn-Table, Self-Centering,** with hand-rests, each,	**6.00**

This turn-table is of the most improved construction. Angular prongs are moved by pressure of the fingers upon the milled ring of upright table supporting pillar. Glass slips of different sizes can be quickly centered thereon by adjustable pins. Spring clips are also provided for use in finishing decentered slides. Only one hand is required to manipulate this turn-table.



No. 4900.

No. 4905.

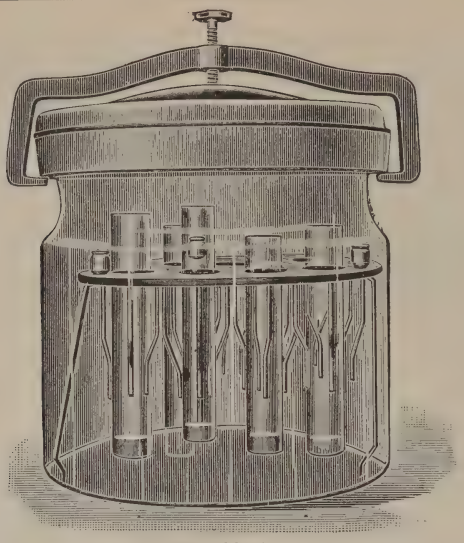


No. 4910.

4895.	**Brass Table,** with lamp for heating slides,	**1.50**
4900.	**Mounting Stand,** with lamp and separating sand bath,	**2.00**
4905.	**Eyeshade,** Dr. R. H. Ward's, each,	**.50**

The construction of this shade was first suggested by Dr. R. H. Ward. By its use both eyes may be kept open, which is less fatiguing than using only one eye. Eyepieces may be changed without removing the shade. In ordering, it is necessary to send approximately the size of the tube to which it is to be attached.

4910.	**Eyeshades,** Aubert's Binocular, per pair,	**1.50**
4915.	**Spring Compressors,** metal, for holding down covers on slide, per dozen,	**.40**
4920.	**Spring Compressors,** wood, per dozen,	**.25**



No. **4950.**

No. Price.

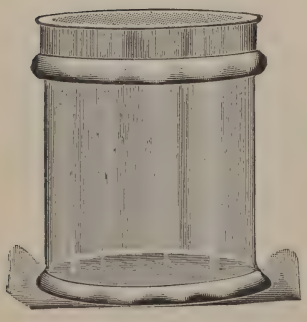
4950. Dehydrating Apparatus, Thomas', each, - - - - - - **$7.50**

This apparatus consists of a heavy glass jar, 190 x 200 mm., having a glass cover fitting air tight by means of clamp and rubber band. Supported in the jar are glass cylinders of various diameters and about 150 mm. long, each cylinder having in the bottom a removable chamois skin diaphragm fastened by a nickeled spring. The cylinders are supported at any desired height by a rubber ring passing around them. The dehydrating fluid is placed in the jar and the cylinder partly filled with a weaker solution in which the tissue to be hardened is placed. By osmosis the weak fluid in the cylinder gradually becomes of the same strength as the fluid in the jar. Tissues hardened in this apparatus do not shrink as when hardened in the usual manner.

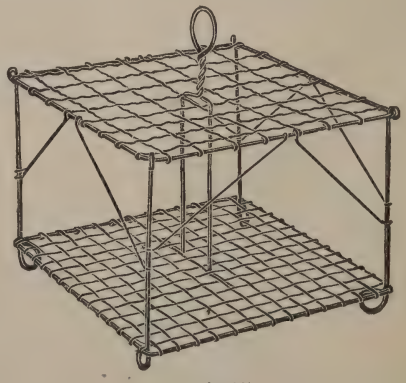
The apparatus as now made conforms to description and not to the above cut.

4955. Dehydrating Apparatus, Schulze's, each, - - - - - - **1.50**

Consisting of one dehydrating tube, flask for containing the dehydrating fluid and ground glass cap fitting air tight over the top of flask.



No. **4960.**



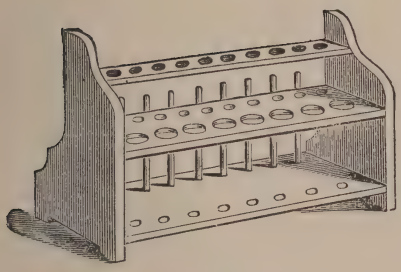
No. **4965.**

4960. Mouse Jars, cylindrical, with foot and woven wire cover which fastens on with bayonet catch. 20 cm. high, 15 cm. diameter, each. - - - - - **1.50**

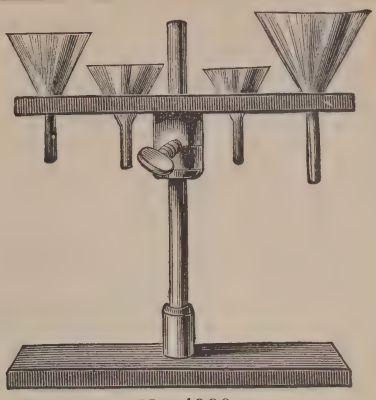
4965. Test Tube Racks, of wire, nickeled, square, for 49 tubes, each, - - **.40**

4970. Test Tube Racks, of wire, nickeled, circular, for 40 tubes, each, - - **.40**

These racks are very light, clean and convenient, and may be used for drying as well as supporting tubes. Especially useful in bacteriological laboratories as they may be sterilized.



No. 4980.



No. 4990.

No. | Price.

4975. **Test Tube Rack** of wood for 23 tubes, each, - - - - - **$ .35**

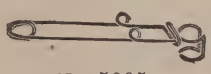
4980. **Test Tube Rack,** same as No. 4975, but with pins for drying tubes in addition, each, - - - - - - - - - - - **.50**

4985. **Support for Funnel,** triangular, of wood, to place upon Beakers, etc.

Diam. - -	50	100	150	200 mm.
Price, each, -	**$ .20**	**.25**	**.30**	**.35**

4990. **Filter Stand,** adjustable for height, for four funnels, each, - - - **1.00**

No. 5000.



No. 5005.

No. 5010.

No. 5015.

4995. **Wax Pencils,** for writing on glass, each, **$ .15,** per dozen, - - - **1.50**

4996. **Diamond** for writing on glass, - - - - - - - **4.00**

5000. **Test Tube Holder,** usual form, of wood, each, **$ .15,** per dozen, - - **1.50**

5005. **Test Tube Holder,** of spring wire, nickeled, each, - - - - - **.15**

5010. **Test Tube Holder and Support** of spring wire, nickeled, each, - - - **.25**

This holder is so made that when applied to the test tube it forms a firm and convenient handle, and when it is desired to set the tube down, the holder forms a support for the tube, holding it in vertical position.

5015. **Beaker Holder,** of spring wire, nickeled, each, - - - - - **.25**

No. 5020.

No. 5030.

5020. **Test Tube Cleaners,** bristle, with wire handle and bristle end, superior quality, each, **$ .08,** per dozen, - - - - - - - - - **.80**

5025. **Test Tube Cleaners,** bristle, with metal handle and sponge end, superior quality, each, **$ .10,** per dozen, - - - - - - - - - **1.00**

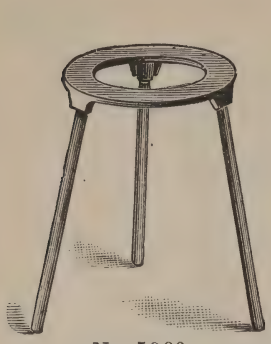
5030. **Test Tube Cleaners,** sponge, with rattan handle, each, **$ .10,** per dozen, - **1.00**

5035. **Test Tube Cleaners,** sponge, with whalebone handle, each, **$ .15,** per dozen, **1.50**

5040. **Cleaning Brushes,** large, bristle, with metal handles, for Graduates, Beakers, &c., each, **$. 15,** per dozen, - - - - - - - - - **1.50**

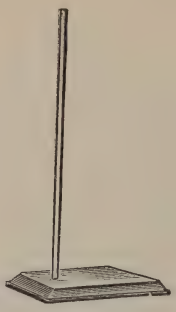
5045. **Potato Brushes,** for cleaning potatoes, etc. to be sterilized, each, **$ .25,** per doz., **2.50**

5050. **Hand Brushes,** each, **$ .25,** per dozen, - - - - - - - **2.50**



No. 5060.

No. 5075.



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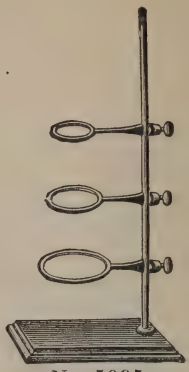
No. 5085.



No. 5095

5055. **Pinch Cock, Mohr's,** of spring wire, nickeled.

Size,	1	2	3	4
Price, each,	$ .15	.20	.25	.30
Per dozen,	1.50	2.00	2.50	3.00

5060. **Tripod,** Iron, for water bath, sand bath, retorts, &c., 70 mm. diam. with one ring, each, $ .30

5065. **Tripod,** same as No. 5060, but 150 mm. diam. and with 3 rings, each, .60

5070. **Tripod,** same as No. 5060, but 200 mm. diam and with 5 rings, each, 1.00

5075. **Apparatus Stand,** with circular base, each, .50

5080. **Apparatus Stand,** large size, with rectangular flat base, each, .50

5085. **Apparatus Stand,** large size, with tripod base, heavy, each, .50

5090. **Apparatus Stand,** large size, rectangular base, with 2 rings, each, .80

5095. **Apparatus Stand,** large size, rectangular base, with 3 rings, each, 1.00

5100. **Apparatus Stand,** large size, rectangular base, with 4 rings, each, 1.25

5105. **Rings for Apparatus Stand,** applicable to any stand.

Diameter,	55	75	100	150 mm.
Price, each,	$ .15	.18	.20	.25

5110. **Extension Rings for Apparatus Stand,**

Size,	55	75	100	150 mm.
Price, each,	$ .15	.18	.20	.25

No. 5110.

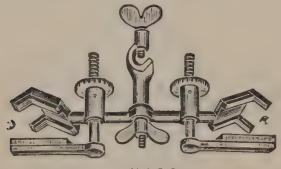
No. 5115.

No. 5120.

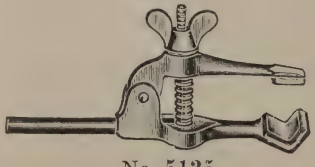
5115. **Clamp,** attachable to apparatus stand, with set screw for fixing at any angle, jaws lined with rubber, each, .50

5120. **Clamp,** attachable to apparatus stand, jaw opening by pressure on lever and held closed by strong spring, each, .75

5125. **Clamp,** double, like No. 5120, but for two pieces of apparatus, each, 1.00



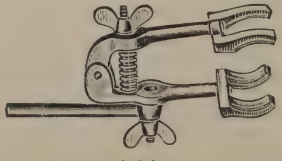
No. 5130.



No. 5135.

5130. **Hoffman's Clamp,** for two pieces of apparatus, each, .75

5135. **Clamp for Burettes or Tubes,** holds apparatus in any position, each, 1.00



No. 5140.

5140. **Bunsen's Universal Clamp,** brass, for holding irregular shaped articles, each, 1.00

5145. **Table Clamp,** usual form for fastening apparatus to table, etc.,

Sizes,	50	75	100	125	150	200 mm.
Price, each,	$.25	.40	.50	.60	.80	1.30

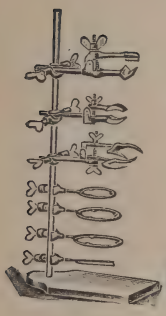
No. 5150.

No. 5155.

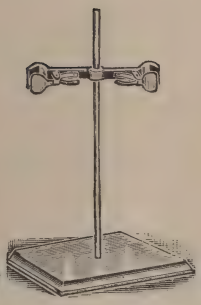
5150. **Clamp Holder**, for fastening apparatus to support, each, - - - **.25**

5155. **Universal Clamp Holder**, may be set at any angle, for fastening clamp to support, each, - - - - - - - - - - **.40**

These clamp holders are light, neat, of ample strength and may be used to attach clamps, extension rings or other apparatus to the supports.

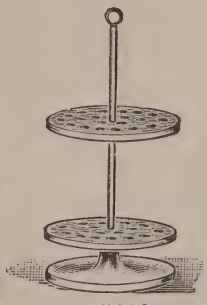


No. 5160.

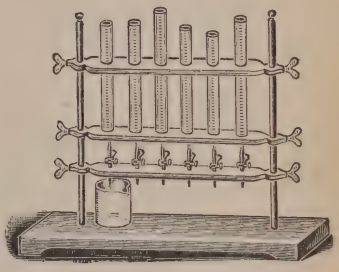


No. 5165.

No. 5170.



No. 5180.



No. 5175.

No.		Price.
5160.	**Bunsen's Universal Apparatus Support**, complete, with 2 clamp holders No. 5150, 1 clamp holder No. 5155, 1 clamp No. 5135, 1 clamp No. 5115, and 1 clamp No. 5140, 3 rings No. 5105, and fork for burner all on support No. 5080, each,	**$6.00**
5165.	**Support for 2 Burettes**, complete, with double clamp and stand, each, -	**1.25**
5170.	**Support for 8 Burettes**, revolving, each, - - - - - -	**3.00**
5175.	**Adjustable Support for 6 Burettes**, each, - - - - - -	**6.00**
5180.	**Support for Pipettes**, revolving, arranged to receive a number of pipettes. Prevents breakage and drains the pipettes properly, each, - - - -	**2.50**

5185. **Asbestos Plates**, bound with metal, for placing beneath incubators, water baths, burners, heated vessels, etc.

Size, -	165 x 165	200 x 200	250 x 250	330 x 330	500 x 500 mm.
Price, each,	**$.30**	**.35**	**.40**	**.50**	**.65**

5190. **Pliers**, flat nose, steel.

Length, - - -	110	125	150	200 mm.
Price, each, - -	**$ .40**	**.45**	**.55**	**.75**

5195. **Wire Cutting Pliers**, end cut, 110 mm. long, each, - - - - **1.25**

5200. **Wire Cutting Pliers**, end cut, 150 mm. long, each, - - - - **1.75**

5205. **Triangular Files**, best quality, for cutting glass tubing, etc.

Length, - -	75	100	125	150	200 mm.
Price, each, -	**$ .12**	**.15**	**.20**	**.25**	**.35**

5210. **Round Files**, best quality, with fine point (rat tail file).

Length, -	75	100	125	150	175	200 mm.
Price, each,	**$ .12**	**.15**	**.20**	**.25**	**.30**	**.35**

5215. **Wire Gauze**, heavy, for supporting dishes, etc.

Size, -	100 x 100	125 x 125	150 x 150	175 x 175	200 x 200
Per doz. pieces,	**$ .25**	**.35**	**.50**	**.75**	**1.00**

No. Price.

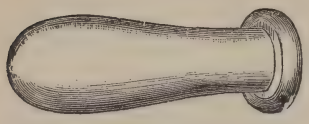
5220. **Rubber Tubing**, white.

Inside Diameter,	1.5	3.0	5.0	6.0	8.0	9.0	12.0 mm.
Per foot, -	$ .05	.06	.07	.08	.10	.15	.20

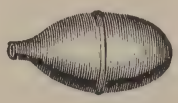
5225. **Antimony Rubber Tubing**, pure gum, does not harden.

Inside Diameter,	1.5	3.0	5.0	6.0	8.0	9.0	12.0 mm.
Per foot, -	$ .06	.08	.10	.12	.15	.20	.25

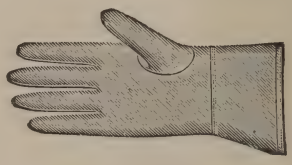
5230. **Gas Tubing**, heavy, cloth covered stiffened with wire and with threaded nipples for connecting lamps, etc. with gas supply, per foot, - - - **$ .15**



No. **5235.**

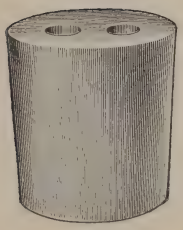


No. **5250.**

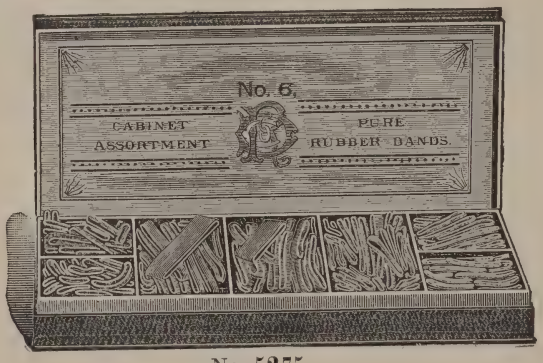


No. **5265.**

5235. **Antimony Rubber Bulbs**, small, for pipettes (about 2 cc.), per dozen, - - **.30**
5240. **Antimony Rubber Bulbs**, medium, for pipettes (about 5 cc.), per dozen), - **.40**
5245. **Antimony Rubber Bulbs**, large, for pipettes (about 10 cc.), per dozen), - **.50**
5250. **Antimony Rubber Bulbs**, larger, for pipettes (about 20 cc.), each, **$ .20,** per dozen, - - - - - - - - - - - **2.00**
5255. **Rubber Fingers**, pure gum, small, for ladies, per dozen, - - - - **.45**
5260. **Rubber Fingers**, pure gum, large, for men, per dozen, - - - - **.50**
5265. **Rubber Gloves,** with 125 mm. gauntlet, ladies', pure gum, dissecting, sizes 6 to 9, per pair, - - - - - - - - - - **2.25**
5270. **Rubber Gloves,** with125 mm. gauntlet, men's, pure gum, dissecting, sizes 10 to 12, per pair, - - - - - - - - - - **2.50**



No. **5290.**



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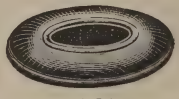


No. **5280.**

5275. **Box of Pure Rubber Bands**, assorted sizes, containing the most useful sizes in convenient form for use, each, - - - - - - - - **1.00**
5280. **Rubber Caps for Closing Test Tubes**, large, for tubes over 15 mm. diameter, per dozen, **$ .50,** per gross, - - - - - - - **5.00**
5285. **Rubber Caps for Closing Test Tubes**, small, for tubes less than 15 mm. diameter, per dozen, **$ .40,** per gross, - - - - - - - **4.00**

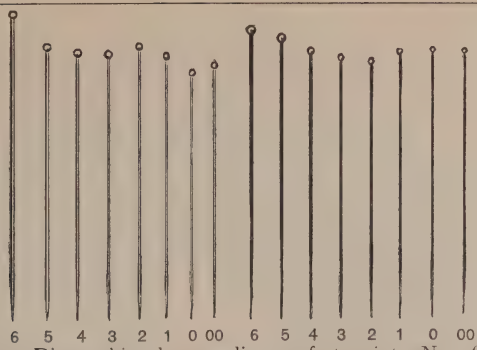
5290. **Rubber Stoppers**, solid,

Size, -	1	2	3	4	5	6	7	8	9	10 mm.
Length, -	14	16	18	20	22	24	26	28	30	32 mm.
Diam. at top,	10	12	14	16	18	20	22	24	26	28 mm.
Diam. at bottom,	8	9	11	12	12	14	16	16	18	20 mm.
Per dozen,	$ .10	.12	.14	.16	.18	.20	.28	.35	.40	.50
Per gross,	1.00	1.20	1.40	1.60	1.80	2.00	2.50	3.50	4.00	5.00

5295. **Antimony Rubber Stoppers**, pure gum, very best quality, will not harden. These stoppers are furnished with either one or two holes, or solid. Unless otherwise specified we send them solid.

Length, - -	25	25	25	25	27	27	30	30 mm.
Diam. at top, -	14	15	18	20	23	26	29	32 mm.
Diam. at bottom, -	10	12	13	17	19	22	24	26 mm.
Approx. No. per lb.,	200	150	90	75	50	40	30	25
Price per dozen,	$ .15	.20	.30	.40	.60	.75	1.00	1.25

Per pound, - - - - - - - - - **2.25**



5300. **Klaeger Insect Pins,** white, best quality, perfect points, Nos. 00 to 6 per 100 of a size, **$ .15,** per 1000 of a size, - - - - - - - **$1.25**

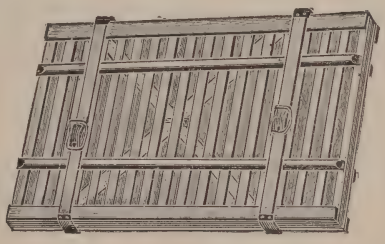
5305. **Klaeger Insect Pins,** black enameled, with yellow metal heads, perfect points, Nos. 00 to 6 per 100 of a size, **$ .20,** per 1000 of a size, - - - - **1.75**

5310. **Pinning Forceps,** steel, nickeled, extra heavy, each, - - - - **1.50**

5315. **Sheet Cork,** for lining cabinets and boxes, in sheets, 100 x 300 mm. and 5 mm. thick, best (***) quality, per doz. sheets, - - - - - - **1.60**

5320. **Sheet Cork,** for lining cabinets and boxes, in sheets 100 x 300 mm. and 5 mm. thick, good (**) quality, per doz. sheets, - - - - - - **1.00**

No. 5325.



No. 5330.

5325. **Vasculum,** each, - - - - - - - - - - - **1.50**

Of tinned metal, enameled to prevent tarnishing and absorption of heat. With rings and strap, and door extending along the whole side, permitting placing of large specimens inside without danger of breaking. Dimensions, length 450 mm., width 150 mm., height 200 mm.

5330. **Portable Plant Press,** complete, with straps, each, - - - - - **2.50**

This press is made of light wood, the pieces being arranged so as to give the greatest strength and rigidity combined with least weight. The arrangement of the straps is such that the press may be opened like a book and specimens placed between the driers in the field, the sheets having specimens between them being held secure from wind gusts by elastic bands. This press not only affords the best means for field collecting but answers the purpose of a drying press as well.

5333. **Gray Standard Herbarium Mounting Paper,** per ream, - - - - **6.75**

5335. **Standard Genus Covers,** per 100, - - - - - - - - - **3.00**

5337. **Driers,** heavy felt, per 100, - - - - - - - - - **1.50**

5339. **Pressing Paper,** folded and trimmed, best white, per ream, - - **1.50**

5340. **Dissecting Pans,** of heavily tinned metal, each, **$ .25,** per dozen, - - - **2.50**

These pans are intended for laboratory use, being strongly built and having metal loops near the four corners, so arranged that cords from the limbs of animals may be passed through them for holding firmly in position during dissection. It is intended that a layer of wax or paraffine be poured in the bottom of the pans into which pins, etc. may be stuck. The four loops also serve to hold the layer of wax in position.

Dimensions, 275 mm. long, 225 mm. wide, 35 mm. deep.

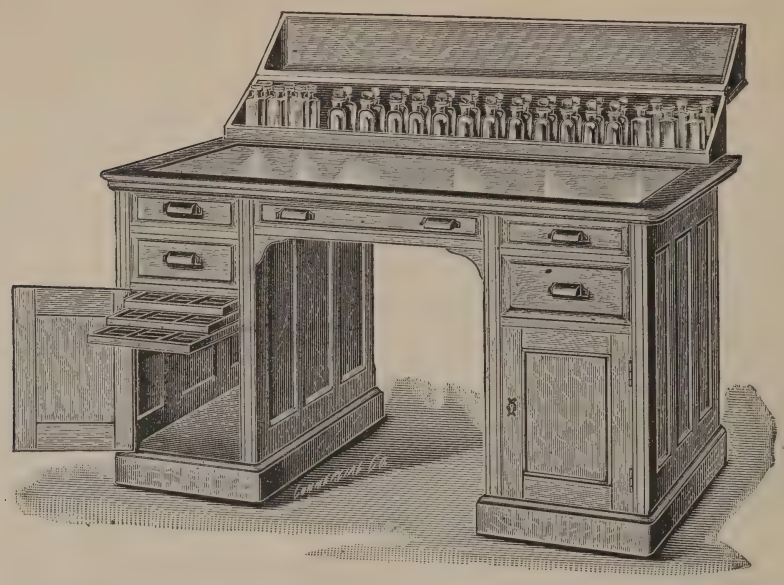
5345. **Dissecting Pans,** same as No. 5340, but lined with wax, each, **$ .35,** per dozen, **3.50**

5350. **University Double and Reversible Note Book Covers,** open side, each, - **.40**

These covers are so made that the Notes or Manuscripts can be written or referred to from either side with equal facility.

5355. **Paper** cut and punched to fit above, with fasteners, per pound, plain, - - **.40**

(Each cover holds ½ pound of paper at a time. When sent by mail, **15** cents per pound additional.)

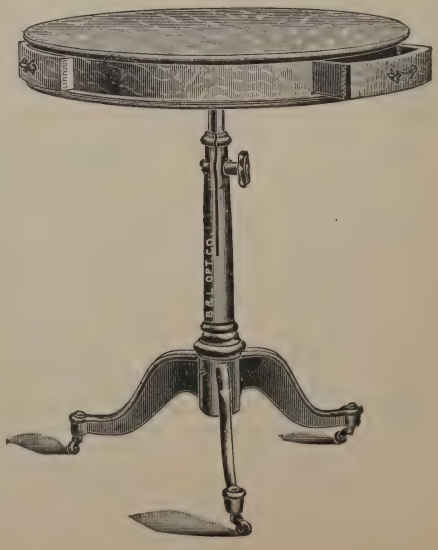


No. Price.

5375. Microscopical Office Desk, Price, complete, boxed, ready for shipment, **$40.00**

This desk is of handsome quartered oak, elegantly paneled and finished. It is a full sized office desk, the top being 54 x 32 inches. Height to top of table 30 inches. Drawer pulls are of neat design and heavily nickeled, each drawer with lock and key. The top has heavy plate glass inlaid forming a perfect surface for microscopical work, drawing, etc. One of the special features is the reagent case containing twelve 250 cc., nine 125 cc., and twelve 60 cc. glass stoppered reagent bottles, also tray for pipettes, etc. The case has dust proof cover and lock. Five capacious drawers furnish ample space for manuscript, drawing materials, optical accessories, etc., and a large compartment, with door on the right, affords space for storing glassware, filter stands, etc. The left hand lower compartment is intended for the microscope and has also three trays with 200 spaces for mounted slides. This desk is a practical and necessary accessory for the physician's office, the professor's private office, and for the library of the individual inclined to microscopical research.

5380. Microscopical Table, with revolving top and vertical adjustments, **$10.00**



This table is of solid quartered oak with japanned iron base. The top is 76 cm. in diameter and has three drawers with ornamental brass handles. The table may be raised and lowered as desired from 79 cm. to 112 cm. and clamped in position by a heavy hand clamp. The adjusting bar being 3 cm. in diameter, the table is equally as stable as if supported on four legs. The top may also be revolved and when desired can be clamped by a separate hand clamp so as not to revolve. We recommend this as the handsomest, most substantially made and convenient microscope table ever offered.

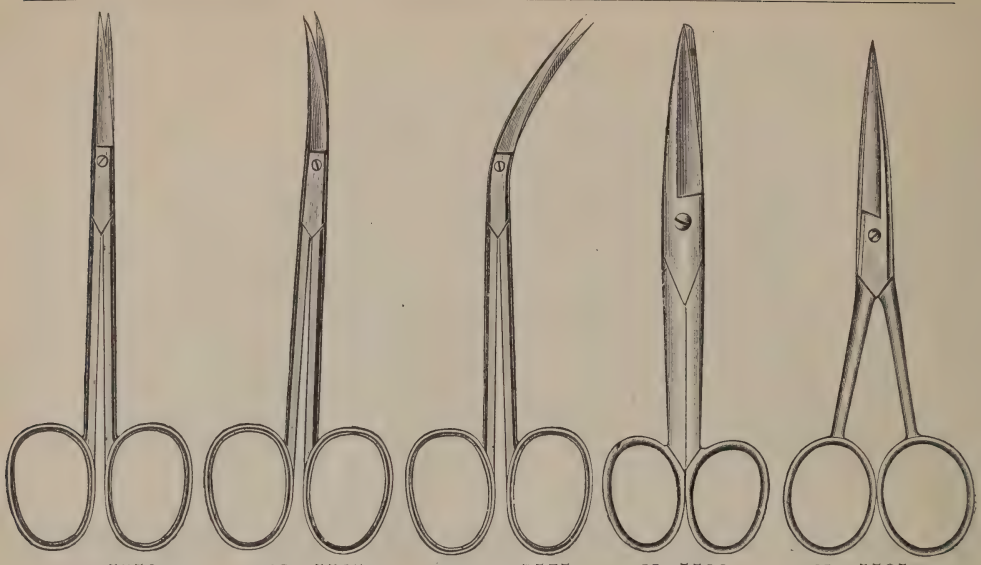
5400. 5405. 5410. 5415. 5420. 5425. 5430. 5435. 5440. 5445. 5450.

EXACT SIZE AND SHAPE OF BLADES.

This figure shows the style of handle, etc., of all the above knives.

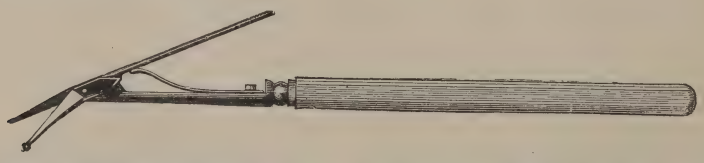
No.		Price.
5400.	**Dissecting Knife,** best, ***, quality, ebony handle, each,	$ .40
5405.	**Dissecting Knife,** best, ***, quality, ebony handle, each,	.40
5410.	**Dissecting Knife,** best, ***, quality, ebony handle, each,	.40
5415.	**Dissecting Knife,** best, ***, quality, ebony handle, each,	.40
5420.	**Paraffine Knife,** for trimming paraffine blocks, cork, etc., ebony handle, each,	.35
5425.	**Dissecting Scalpel,** best, ***, quality, cutting edge of blade 50 mm. long, ebony handle, each,	.35
5430.	**Dissecting Scalpel,** like No. 5425, best, cutting edge of blade 45 mm. long, each,	.35
5435.	**Dissecting Scalpel,** like No. 5425, best, cutting edge of blade 38 mm. long, each,	.35
5440.	**Dissecting Scalpel,** like No. 5425, best, cutting edge of blade 32 mm. long, each,	.35
5445.	**Dissecting Scalpel,** like No. 5425, best, cutting edge of blade 25 mm. long, each,	.35
5450.	**Dissecting Scalpel,** like No. 5425, best, cutting edge of blade 18 mm. long, each,	.35
5455.	**Dissecting Scalpel,** best, ***, quality, same shape as No. 5425, **all steel,** nickeled, easily cleaned, and sterilized cutting edge of blade 45 mm. long, each,	.40
5460.	**Dissecting Scalpel,** like No. 5455, cutting edge of blade, 38 mm. long, each,	.40
5465.	**Dissecting Scalpel,** like No. 5455, cutting edge of blade, 32 mm. long, each,	.40
5470.	**Dissecting Scalpel,** like No. 5455, cutting edge of blade, 25 mm long, each,	.40
5475.	**Dissecting Scalpel,** good, *, quality, cutting edge 45 mm. long, ebony handle, each,	.25
5480.	**Dissecting Scalpel,** good, *, quality, cutting edge 38 mm. long, ebony handle, each,	.25
5485.	**Dissecting Scalpel,** good, *, quality, cutting edge 32 mm. long, ebony handle, each,	.25
5490.	**Dissecting Scalpel,** good, *, quality, cutting edge 25 mm. long, ebony handle, each,	.25
5495.	**Cartilage Knife,** all steel, best, ***, quality, corrugated handle, cutting edge of blade, 45 mm. long, each,	.50
5500.	**Cartilage Knife,** all steel, good * quality, corrugated handle, cutting edge of blade, 45 mm. long, each,	.40
5505.	**Cartilage Knife,** heavy, cutting edge of blade 70 mm. long, heavy ebony handle, each,	1.50
5510.	**Cartilage Knife,** extra heavy cutting edge of blade, 90 mm. long, heavy ebony handle, each,	2.00
5515.	**Brain Knife,** best, ***, quality, ebony handle, blade 125 mm. long, each,	2.00
5520.	**Potato Knife,** each,	.20

The knives listed above are all of the best quality steel especially made for laboratory use. The * quality instruments differ from the *** only in external finish. Each instruments bears our name at the base of the blade.

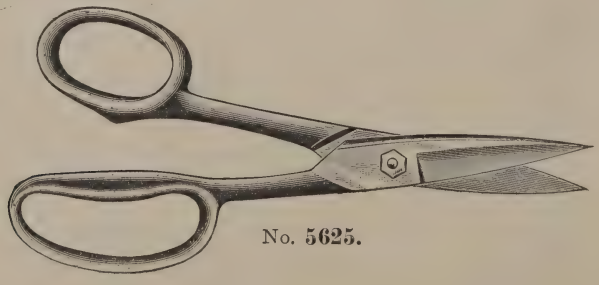


No. 5550. No. 5565. No. 5575. No. 5590. No. 5585.

No.		Price.
5550.	**Dissecting Scissors**, fine, straight, best, ***, quality, nickeled, 115 mm. long, each,	$ .60
5555.	**Dissecting Scissors**, fine, straight, best, ***, quality, polished, 115 mm. long, each,	.50
5560.	**Dissecting Scissors**, fine, straight, good, *, quality, 115 mm. long, each,	.40
5565.	**Dissecting Scissors**, fine, curved, best, ***, quality, nickeled, 115 mm. long, each,	.75
5570.	**Dissecting Scissors**, fine, curved, best, ***, quality, polished, 115 mm. long, each,	.60
5575.	**Dissecting Scissors**, fine, bent, best, ***, quality, nickeled, 115 mm. long, each,	.75
5580.	**Dissecting Scissors**, fine, bent, best, ***, quality, polished, 115 mm. long, each,	.60
5585.	**Dissecting Scissors**, medium, straight, best, ***, quality, 115 mm. long, each,	.35
5590.	**Dissecting Scissors**, medium, straight, one point blunt, best, ***, quality, 115 mm. long, each,	.75
5595.	**Dissecting Scissors**, medium, straight, good, *, quality, 115 mm. long, each,	.25
5600.	**Dissecting Scissors**, heavy, straight, best, ***, quality, 140 mm. long, each,	.50
5605.	**Dissecting Scissors**, heavy, straight, one point blunt, best, ***, quality, 140 mm. long, each,	.75
5610.	**Anatomical Scissors**, best, ***, quality, 175 mm. long, each,	1.00



5615. **Dissecting Scissors**, extra fine, blades opening automatically by spring, genuine ivory handle, length 140 mm., each, 5.00



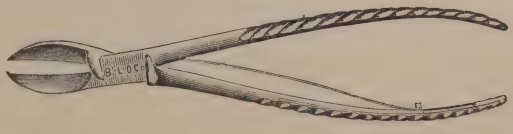
No. 5625.

5620.	**Cartilage Shears**, steel, nickeled, heavy, 200 mm. long, each,	3.00
5625.	**Laboratory Shears**, straight, extra heavy, bolt joint, 200 mm. long, blades 50 mm. long, each,	1.25
5630.	**Laboratory Shears**, curved, extra heavy, bolt joint, 200 mm. long, blades 65 long, each,	2.00
5635.	**Shears**, usual form for cloth, paper, etc., length, 250 mm., each,	1.00

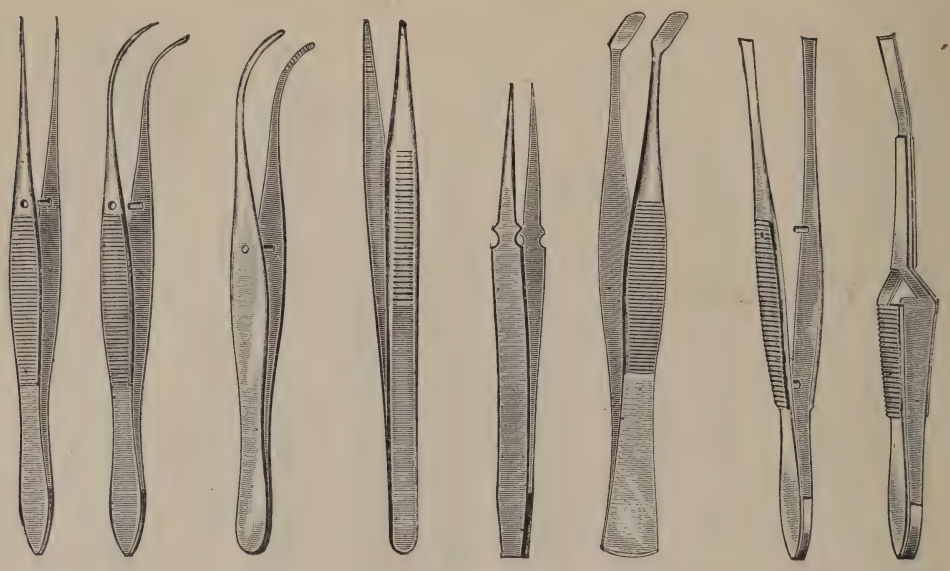
Nos. 5710. 5705. 5700. 5720. 5715. 5725. 5730. 5735. 5740.

5700. **Section Lifter**, nickeled, length 100 mm., blade 18 mm. wide, each, - - **.10**
5705. **Section Lifter**, nickeled, length 150 mm., blade 22 mm. wide, each, - **.15**
5710. **Section Lifter**, nickeled, length 125 mm., with 2 blades 10 mm. and 22 mm. wide respectively, each, - - - - - - - - **.25**
5715. **Section Lifter**, nickeled, ebony handle, blade 4 mm. wide, each, - - **.30**
5720. **Section Lifter**, nickeled, ebony handle, two blades, 6 mm. and 10 mm. wide respectively, each, - - - - - - - - **.40**
5725. **Section Lifter**, very thin and flexible, nickeled, ebony handle, blade 12 mm. wide, each, - - - - - - - - - **.35**
5730. **Section Lifter**, very thin and flexible, nickeled, ebony handle, blade 18 mm. wide, each. - - - - - - - - - **.35**
5735. **Section Lifter**, very thin and flexible, nickeled, ebony handle, blade 38 mm. wide, each, - - - - - - - - - **.40**
5740. **Section Lifter**, concave, perforated, nickeled, ebony handle, bowl 18 mm. diam. each, - - - - - - - - - - **.80**

5775. **Bone Forceps**, steel, nickeled, straight blades, lock joint, finest quality, length 200 mm., each, - - - - - - - - - - **2.50**

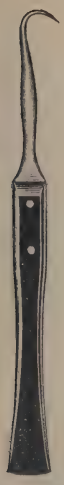


5780. **Bone Forceps**, steel, nickeled, straight blades, lock joint, finest quality, length 200 mm., each, - - - - - - - - - **2.75**



5800. 5805. 5820. 5845. 5850. 5870. 5875. 5880.

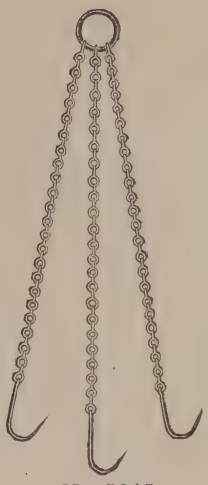
No.		Price.
5800.	**Dissecting Forceps**, best, ***, quality, steel, nickeled, straight, 115 mm. long, with fine file cut points and with pin to prevent slipping of blades, handle corrugated, each,	$ .60
5805.	**Dissecting Forceps**, best, ***, quality, same as No. 5800, but with curved points, each,	.60
5810.	**Dissecting Forceps**, best, ***, quality, straight, same as No. 5800, but 100 mm. long, each,	.50
5815.	**Dissecting Forceps**, best, ***, quality, curved points, same as No. 5805, but 100 mm. long, each,	.50
5820.	**Dissecting Forceps**, best, ***, quality, steel, nickeled, fine curved points, smooth handle, length, 115 mm., each,	.50
5825.	**Dissecting Forceps**, best, ***, quality, medium heavy, straight, steel, nickeled, corrugated points and handle, with pin, length 115 mm.,	.50
5830.	**Dissecting Forceps**, best, ***, quality, same as No. 5825, but 120 mm. long and slightly heavier, each,	.60
5835.	**Dissecting Forceps**, best, ***, quality, heavy, straight, steel, nickeled, corrugated points and handle, two pins, one preventing slipping of blades and the other making it impossible to open points by heavy pressure, length 130 mm. each,	.60
5840.	**Dissecting Forceps**, best, ***, quality, same as No. 5825, but heavier and 145 mm. long, each,	.75
5845.	**Dissecting Forceps**, best, ***, quality, steel, nickeled, corrugated points and handle, **for vertebrate work**, length 125 mm., each,	.40
5850.	**Dissecting Forceps**, good, *, quality, fine points, straight, steel, nickeled, length 95 mm., each,	.25
5855.	**Dissecting Forceps**, good, *, quality, fine curved corrugated points, steel, nickeled, smooth handle, length, 190 mm., each,	.20
5860.	**Dissecting Forceps**, steel, blunt corrugated blades, length 110 mm., each,	.15
5865.	**Dissecting Forceps**, spring, brass, nickeled, 85 mm. long, each,	.10
5870.	**Cover Glass Forceps**, best, ***, quality, steel, nickeled, points bent at an angle, length 100 mm., each,	.75
5875.	**Cover Glass Forceps**, best, ***, quality, steel, nickeled, with pin and corrugated handle, straight, points flat, extremely thin, length 120 mm., each,	.50
5880.	**Cover Glass Forceps**, self closing, best, ***, quality, extremely well adapted to mounting and general microscopy, each,	.80
5885.	**Artery Forceps** (Serrafines), self closing, steel, nickeled, best, ***, quality,	.50



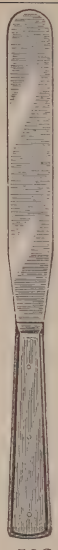
No. 5900.

No. 5905.

No. 5910.



No. 5915.

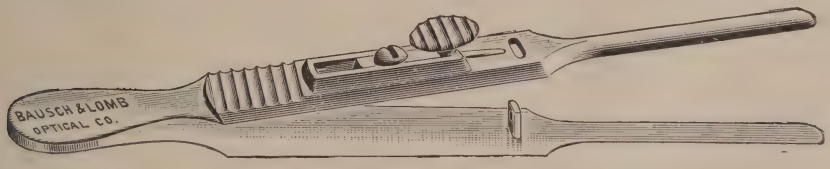


No. 5920.

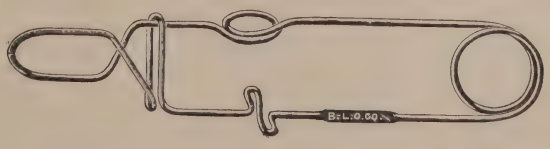
No.		Price.
5900.	**Tenaculum,** ebony handle, each,	**$.25**
5905.	**Seeker,** all steel, each,	**.25**
5910.	**Blow Pipe,** nickeled, each,	**.15**
5915.	**Dissecting Hook and Chains,** triple, each,	**.20**
5920.	**Spatulas,** flexible steel blades.	

Length of blade,	100	125	150	175 mm.
Price, each,	**$.25**	**.30**	**.35**	**.45**

3921. **Spatulas,** horn, each, **.25**

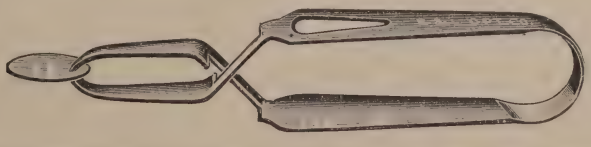


5925. **Ehrlich's Cover Glass Forceps,** for holding cover glasses for securing thin film of blood, etc. on the cover, each, **1.50**

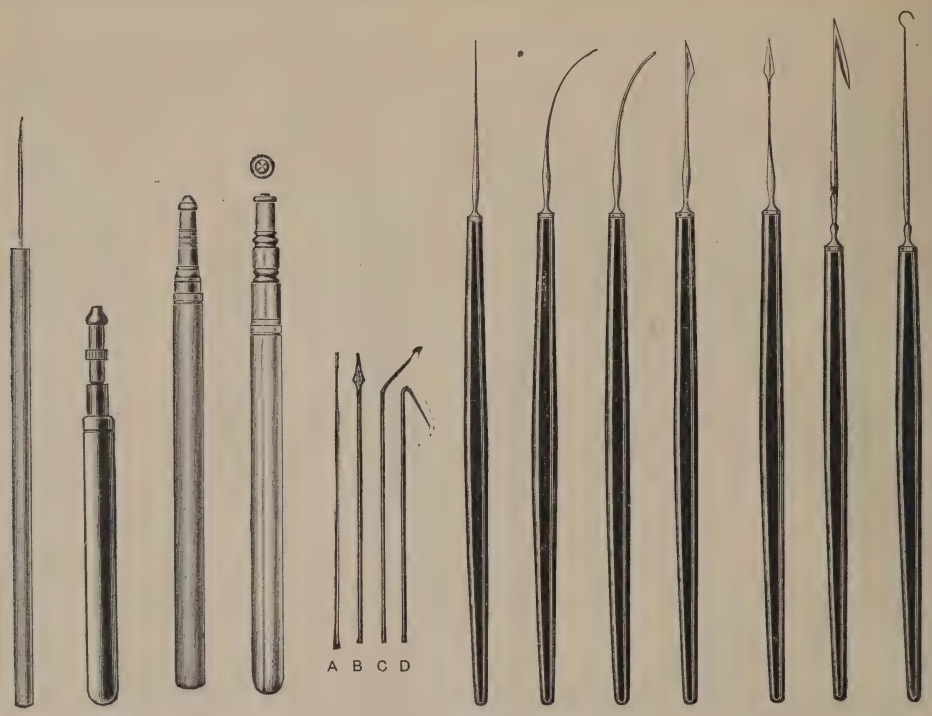


5930. **Dr. Stewart's Cover Glass Staining Forceps,** of heavy spring wire, nickeled, each, **.25**

This forceps is accurately made, is light and easily sterilized. Indispensable for class use, etc. in bacteriological laboratories.



5935. **Cornet's Cover Glass Staining Forceps,** of spring brass, heavily nickeled and carefully adjusted, each, **.50**

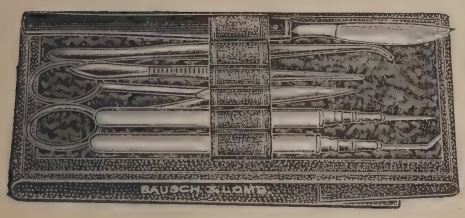


5950. 5960. 5970. 5980. 5990. 6000. 6005. 6010. 6015. 6020. 6025. 6030.

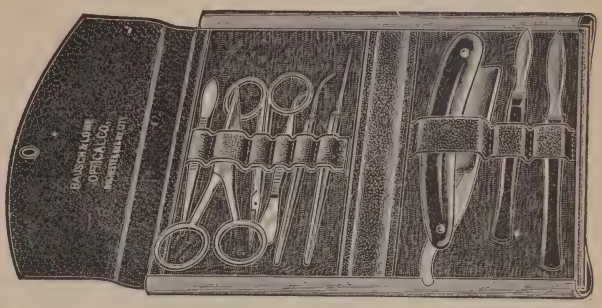
No.		Price.
5950.	**Dissecting Needle**, straight, in plain cedar wood handle, per dozen,	**$ .50**
5955.	**Dissecting Needle**, bent, in plain cedar wood handle, per dozen,	**.60**
5960.	**Dissecting Needle Holder**, bone, with nickeled adjustable clamp holding any size of needle, length 85 mm. each, **$ .10,** per dozen,	**1.00**
5965.	**Dissecting Needle Holder,** No. 5960, with set of four needles, No. 5990, in box, each, **$ .15,** per dozen,	**1.50**
5970.	**Dissecting Needle Holder**, bone, with nickeled adjustable clamp holding any size of dissecting needle, length 110 mm., each, **$ .15,** per dozen,	**1.50**
5975.	**Dissecting Needle Holder**, No. 5970, with set of four needles No. 5990, in neat box, each, **$ .20,** per dozen,	**2.00**
5980.	**Dissecting Needle Holder**, bone, extra fine quality, highly polished and with perfectly made adjustable German silver clamp securing an absolutely rigid grip on the needle, length 115 mm., each,	**.35**
5985.	**Dissecting Needle Holder**, No. 5980, with set of four needles No. 5990, in neat box, each,	**.40**
5990.	**Dissecting Needles**, steel, 50 mm. long.	

Style,	A	B	C	D
Per dozen,	**$ .10**	**.12**	**.12**	**.12**
Per gross,	**1.00**	**1.20**	**1.20**	**1.20**

6000.	**Dissecting Needle**, straight, sharp, of knife steel with ebony handle, length 130 mm. Each,	**.40**
6005.	**Dissecting Needle**, curved, sharp, of knife steel, with ebony handle, length 130 mm., each,	**.40**
6010.	**Dissecting Needle**, curved, blunt, of knife steel, with ebony handle, length 130 mm., each,	**.40**
6015.	**Dissecting Needle**, with one cutting edge, of knife steel, with ebony handle, length, 135 mm., each,	**.45**
6020.	**Dissecting Needle**, with double cutting edge, of knife steel, with ebony handle, length, 135 mm., each,	**.45**
6025.	**Dissecting Needle**, with harpoon shaped blade having two cutting edges, of knife steel, with ebony handle, length 140 mm. each,	**.75**
6030.	**Dissecting Hook**, extremely fine and delicate, of knife steel, with ebony handle, length 140 mm., each,	**.60**



STYLE A.



STYLE B.

SETS OF

DISSECTING INSTRUMENTS.

All sets of dissecting instruments are supplied in folding pocket cases, of convenient size and substantially made.

The instruments are held in place by loops from which they are quickly and easily removed.

The smaller sets are furnished in cases like Style A which has two flaps protecting the instruments and held together when closed by a catch button.

The more complete sets require cases like Style B. which folds in the middle and has two protecting flaps folding from either edge over the instrument.

All cases for best, ***, quality sets are of fine leather with velvet lining. Style B having chamois skin flaps to cover instruments. Cases for good, *, quality are leatherette with cloth lining.

No. Price.

7000. Anatomical Dissecting Set for Comparative Anatomy, containing

1 Cartilage Knife, No. 5500.
1 Scalpel, No. 5475.
1 Scalpel, No. 5490.
1 Tenaculum, No. 5900.
1 Scissors, No. 5595.
1 Forceps, No. 5485.
1 Blow Pipe, No. 5910.
1 Triple Chain and Hooks, No. 5915.

in Leatherette Case, Style B, per set, - - - - - - **$2.25**

7005. Anatomical Dissecting Set for Comparative Anatomy, containing

1 Cartilage Knife, No. 5495.
1 Scalpel, No. 5430.
1 Scalpel, No. 5445.
1 Tenaculum, No. 5900.
1 Scissors, No. 5585.
1 Forceps, No. 5845.
1 Blow Pipe No. 5910.
1 Triple Chain and Hooks, 5915.
1 Steel Seeker, No. 5905.

in Leather Case, Style B, per set, - - - - - - - **4.00**

7010. Anatomical Dissecting Set, containing

1 Cartilage Knife, No. 5495.
1 Scalpel, No. 5455.
1 Scalpel, No. 5465.
1 Scalpel, No. 5470.
1 Fine Scissors, No. 5555.
1 Heavy Scissors, No. 5600.
1 Heavy Forceps, No. 5845.
1 Medium Forceps, No. 5830.
1 Steel Seeker, No. 5905.
1 Tenaculum, No. 5900.
1 Blow Pipe, No. 5910.
1 Triple Chain and Hooks, No. 5915.

in Leather Case, Style B, per set, - - - - - - - **5.00**

No. Price.

7020. Complete Anatomical Dissecting Set, containing

1 Cartilage Knife, No. 5495,
1 Steel Scalpel, No. 5455,
1 Steel Scalpel, No. 5465,
1 Steel Scalpel, No. 5470,
1 Fine Scissors, No. 5550,
1 Fine Curved Scissors, No. 5565,
1 Probe Point Scissors, No. 5590,
1 Tenaculum, No. 5900,
1 Triple Chain and Hook, No. 5915,
1 Steel Seeker, No. 5905,
1 Forceps, No. 5825,
1 Forceps, No. 5835,
1 Forceps, No. 5845,
1 Blow Pipe, No. 5910,
3 Serrafines, No. 5885,

in Leather Case, style B; per set, - - - - - - **$7.50**

7025. Set of Six Anatomical Weights (2 to 8 oz.), each, with hook, in case, - **1.50**

7030. Botanical Dissecting Set, containing

1 Scalpel, No. 5480,
1 Scissors, No. 5595,
2 Needle Holders, No. 3960, with needles,
1 Forceps, No. 5850,
1 Forceps, No. 5855,

in Leatherette Case, style A; per set, - - - - - - **1.25**

7035. Botanical Dissecting Set, containing

1 Scalpel, No. 5435,
1 Scissors. No. 5555,
2 Needle Holders, No. 5970, with needles,
1 Forceps, No. 5805,
1 Forceps, No. 5825,

Leather Case, style A; per set, - - - - - - **2.25**

7040. Biological Instrument Case, containing

1 Section Razor, No. 2645,
1 Scalpel, No. 5475,
1 Scalpel, No. 5490,
1 Scissors, No. 5560,
1 Scissors, No. 5595,
1 Forceps, No. 5855,
1 Forceps, No. 5825,
2 Needle Holders, No. 5970, with needles.

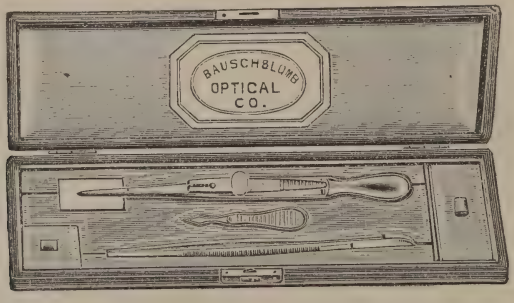
in Leatherette Case, style B; per set, - - - - - - **3.25**

7045. Biological Instrument Case, containing

1 Section Razor, No. 2640,
1 Scalpel, No. 5430,
1 Scalpel, No. 5440,
1 Scissors, No. 5550,
1 Scissors, No. 5585,
1 Forceps, No. 5800,
1 Forceps, No. 5825,
2 Needle Holders, No. 5970, with needles,

in Leather Case, style B; per set, - - - - - - **5.00**

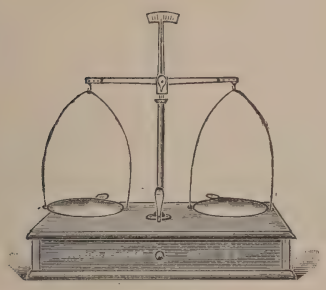
Any other combination of instruments will be made up and fitted to cases of either style A or B on short notice. Prices on application.



7060. Migge's Apparatus for Microscopical Preparation of Blood, complete in fine leather case, with directions for using, - - - - - - **5.00**

The Migge's apparatus consists of one pair of Migge's Lock Forceps, with broad ivory plates attached to the points, one lancet for drawing blood and one pair fine cover glass forceps. The difficulties experienced by those making studies of the blood after the methods requiring the preparation of a thin uniform film of blood on the cover slip has led to the development of this set, which is complete and gives uniform and accurate results. The cause of unevenness in the film of blood is due to the condensation of moisture on the cover slip when brought in contact with the fingers. Condensation is impossible with the use of Migge's apparatus.

SCALES AND BALANCES.



No. **7105.**

No. **7110.**

No. Price.

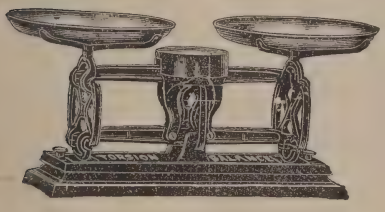
7100. **Hand Balances.** Length of beam 200 mm., in wooden case, price, each, - **$2.00**

7105. **Micro-Chemical Scale,** each, - - - - - - - - - **3.50**

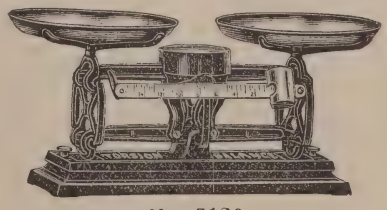
This is a low priced scale of sufficient capacity and accuracy for weighing out the reagents and chemicals necessary for making up the solutions, etc., generally, used in Micro-Biological work. The metal parts are nickeled and mounted on an oak base with drawer for weights. Diameter of pans 75 mm, length of beam 6 inches.

7110. **Torsion Micro-Chemical Scale,** each, - - - - - - - **18.00**

This scale is of the extremely stable and durable Torsion construction, there being no bearing surfaces to wear out or rust. The metal parts except the pans are contained in an enameled case. Pans are of German silver and 100 mm. diameter, sensitive to $\frac{1}{20}$ grain. Any system of weights may be used.



No. **7115.**



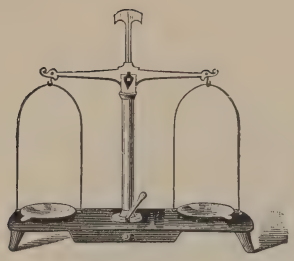
No. **7120.**

7115. **Laboratory Torsion Balance.** Two nickeled pans, - - - - **16.00**

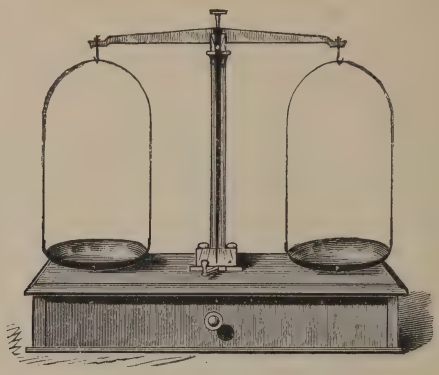
This balance is of the Torsion construction there being no knife edges to rust or wear out. All metal parts except pans which are nickeled, are neatly japaned. Capacity 10 pounds, sensitive to 10 grains. Diameter of pans 150 mm. This balance is especially adapted to general laboratory work where extreme sensitiveness is not required. Any system of weights may be used.

7120. **Laboratory Torsion Balance,** with two nickeled pans and side beam for sliding weight, - - - - - - - - - - **18.00**

This balance is similar to No. 7115 in every respect except that the side beam renders it more convenient for work when numerous drafts are to be weighed.



No. **7125.**

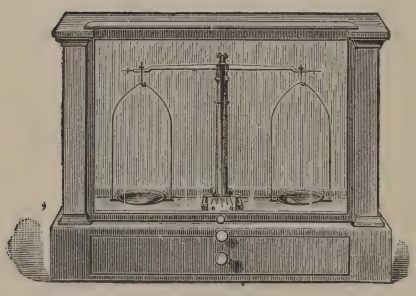


No. **7130.**

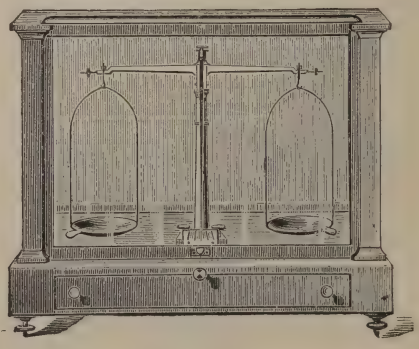
No. Price.

7125. **Prescription Scale** on iron enameled base with sliding drawer to receive the weights. The entire scale is nickel plated. Length of beam, 200 mm.; diameter of scale pan, 75 mm. A full set of weights accompanies each scale. - - **$ 8.00**

7130. **Chemical Scale, for weighing chemicals, etc.** This scale is mounted on box of polished wood. The pans are movable and nickel plated. Beam has adjustment screws for balancing, downward pointer and improved levers. Scale box is provided with drawer. Length of beam, 200 mm.; diameter of pans, 75 mm.; capacity, 150 grams. - - - - - - - - - - **18.00**



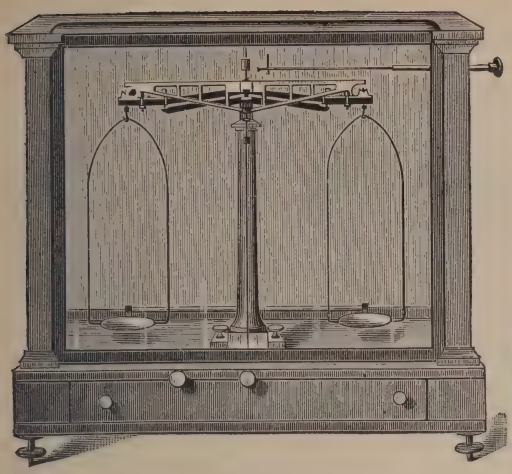
No. **7135.**



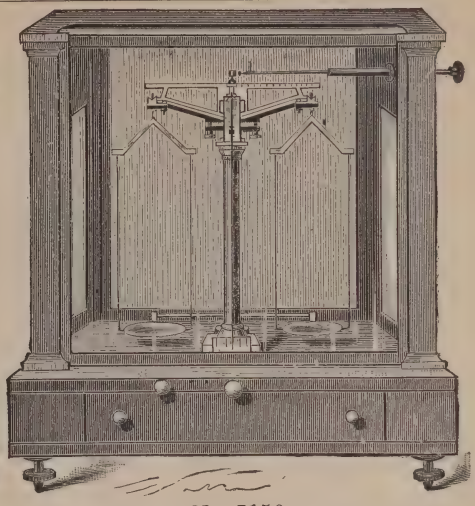
No. **7140.**

7135. **Improved Labaratory Balance**, in polished mahogany case with glass sides, leveling screws and spirit level, counterpoised door sliding upward. The pans are of solid nickel; adjusting screws on beam for balancing. For stability and endurance it has no equal. "There is no other form of scale known to mechanics which will approach it for reliability and uniform accuracy." Sensible to $\frac{1}{50}$ grain. **26.00**

7140. **"Agate" Labaratory Balance**, in polished mahogany case with glass sides and with counterpoised door sliding upward. The case has leveling screws and spirit level, the balance has indicator pointing down; the beam is *plated with gold* and has adjusting screws. All other parts are nickel, except the pans, which are *solid silver*. Pans 75 mm. in diameter. All the bearings of this balance are jeweled. The case is extra large and roomy and is of old mahogany. - - - **52.00**



No. **7145.**



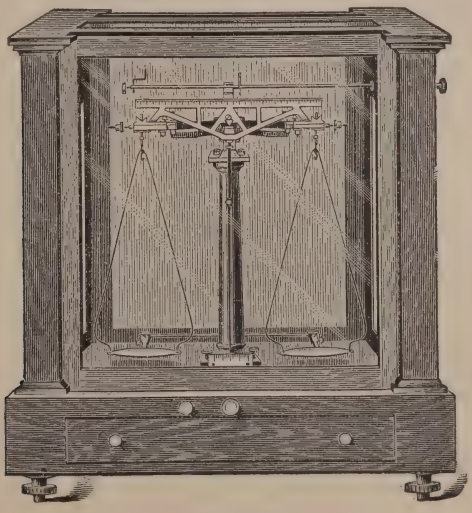
No. **7150.**

No. Price.

7145. **"A" Balance;** capacity, 100 grams in each pan; sensitive to $\frac{1}{10}$ milligram; beam, 250 mm., divided to $\frac{1}{10}$ milligram; pans, solid nickel, 65 mm. with improved arrest. This balance is provided with apparatus for estimating specific gravity. The case is of glass and has counterpoised sliding door, leveling screws and spirit level, - - - - - - - - - **$100.00**

Agate knife edges furnished with this balance, **$12.00,** extra.

7150. **Agate Balance;** capacity, 200 grams in each pan; sensitive to $\frac{1}{10}$ milligram; short arm balance; both arms of beam graduated to $\frac{1}{10}$ milligram; beam is of aluminum, bows and pans are of solid nickel; bows are 100 mm. wide. All the bearings of this balance are of agate. The case is of fine polished mahogany with glass sides, leveling screws, spirit level, etc., etc., - - **112.00**



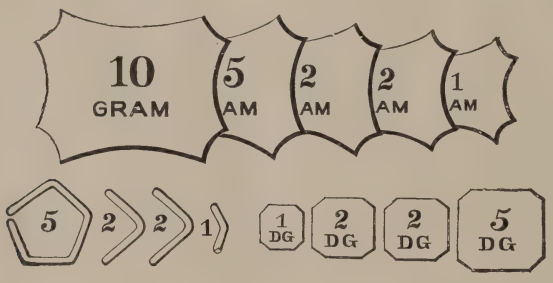
No. **7155.**

7155. **The Standard Short Arm Balance;** short arm, pure aluminum beam, agate planes and knives; no steel used; both arms of the beam are graduated; the pans are of aluminum; all the brass work is gold plated. The case is of elegant mahogany (old wood) with heavy plate glass bottom and glass top to admit light freely, and is provided with improved self locking pan arrest. This balance will carry 200 grams and is sensitive to $\frac{1}{20}$ milligram. All the workmanship is of the very finest, - - - - - - - **150.00**

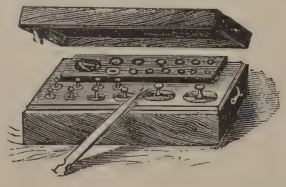
WEIGHTS.

No. 7175.

No.		Price.
7175.	**Square Aluminum Grain Weights**, of pure sheet aluminum, concave so they may be readily picked up; $\frac{1}{2}$ grain to 10 grain, per set,	**$ .50**
7180.	**Avoirdupois Weights**, fractions of ounce; $\frac{1}{4}$ ounce down to $\frac{1}{128}$ ounce; nickel silver; per set,	**.90**



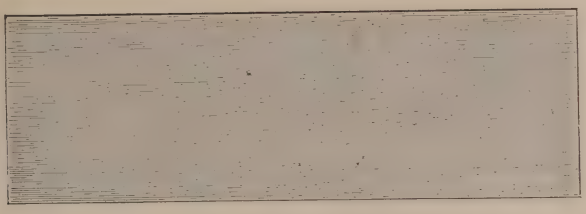
7185.	**Metric Weights**, 10 gram down to 1 centigram; per set,	**.60**
7190.	**Metric Weights**, 1 gram down to 1 centigram; per set,	**.30**
7195.	**Metric Weights**, in cherry block, brass, 100 gram to 1 centigram, per set,	**2.00**
7200.	**Metric Weights**, iron, 1 kilo to 10 gram; per set,	**1.50**



7205.	**Weights of Greatest Precision**, one platinum gram and down to $\frac{1}{10}$ milligram, per set,	**10.00**
7210.	**Weights of Greatest Precision**, ten 1-gram pieces and down to 1 milligram; per set,	**11.25**
7215.	**Weights of Greatest Precision**, two 20-gram pieces and down to 1 milligram and 3 riders; per set,	**14.00**

The above weights are guaranteed of the highest standard of accuracy and are intended for analytical balances, etc.

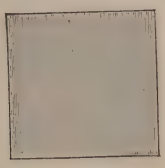
GLASS SLIPS FOR MICROSCOPE OBJECTS.



No.		Per Dozen.	Per Gross.
7300.	**Glass Slips**, green, 3 x 1 inch, cut edges,		$ .45
7305.	" " " " " ground edges,	$.10	.70
7310.	" " white, " " cut edges,		.60
7315.	" " " " " ground edges,	.12	.85
7320.	" " " " " " " thin,	.14	1.00
7325.	" " " $1\frac{1}{4}$ x 1 inch, " "	.14	1.00
7330.	" " " 2 x 1 inch, " "	.18	1.20
7335.	" " " 3 x 2 inches, " "	.30	3.00
7340.	" " " 3 x $1\frac{1}{2}$ " " "	.20	2.00
7345.	" " " 3 x 1 inch, " " with concave centres,	.60	

We recommend the use of our extra white glass slips for clearness and brilliancy.

THIN GLASS COVERS FOR MICROSCOPE OBJECTS.



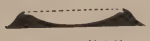
No. **7410.**

No. **7440.**

		Per Dozen.	Per Ounce.
7400.	**Squares**, No. 0, selected, extra thin,	$.20	$2.00
7405.	" No. 1, $\frac{1}{150}$ to $\frac{1}{200}$ inch thick,	.16	1.05
7410.	" No. 2, $\frac{1}{100}$ to $\frac{1}{150}$ " " $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ or 1 inch,	.14	.80
7415.	" No. 3, $\frac{1}{50}$ to $\frac{1}{100}$ " "	.12	.60
7430.	**Circles**, No. 0, selected, extra thin,	.25	2.50
7435.	" No. 1, $\frac{1}{150}$ to $\frac{1}{200}$ inch thick,	.18	1.25
7440.	" No. 2, $\frac{1}{100}$ to $\frac{1}{150}$ " " $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ or 1 inch diameter.	.16	1.00
7445.	" No. 3, $\frac{1}{50}$ to $\frac{1}{100}$ " "	.14	.80
7460.	**Rectangular**, No. 1, $\frac{1}{150}$ to $\frac{1}{200}$ inch thick,		2.00
7465.	" No. 2, $\frac{1}{100}$ to $\frac{1}{150}$ " " any size,		1.05
7470.	" No. 3, $\frac{1}{50}$ to $\frac{1}{100}$ " "		.85

The No. 2 Cover Glass should be used with our nonadjustable objectives.

CELLS TO CEMENT TO GLASS SLIPS.



No. **7515.**

		Per Dozen.
7500.	**Rubber Cells**, various sizes and depths,	$ .15
7505.	**Zylonite Cells**, " " transparent,	.25
7510.	**Glass Cells**, " " "	1.00
7515.	**Atwood Rubber Cells**, for mounting opaque objects,	.30

These cells are made by us; they are exceedingly neat, require but little time in mounting, and have the advantage that objects can be mounted and preserved independent of the slip. They are made for $\frac{1}{2}$ inch covers.

FILTER, LENS AND LITMUS PAPER.

No. Price.

7550. **Japanese Lens Paper**, for cleaning objectives, eyepieces, etc.
In packages of 100 sheets 185 x 275 mm., - - - - - **$ .25**
In packages of 100 sheets 275 x 375 mm., - - - - - - **.45**

7555. **Filter Paper, Schleicher & Schuell's**, thin, white, in sheets, each bearing manufacturer's water mark and No. "595"; size of sheets, 480 x 550 mm.; per 100 sheets, - - - - - - - - - - **2.40**

7560. **Cut Filters, round, Schleicher & Schuell's** No. 595, thin, white, in packages of 100 filters.

Diam,	55	70	90	110	125	150	185	240	270	320	385 mm.
Per package,	**.15**	**.20**	**.25**	**.30**	**.35**	**.40**	**.50**	**.75**	**1.10**	**1.50**	**2.00**

7565. **Filter Paper, Schleicher & Schuell's**, thick, white, insheets, each bearing manufacturer's watermark and number "597"; size of sheets 480 x 550 mm.
This is an excellent paper for blotting microscopical preparations also. Per 100 sheets, - - - - - - - - - - **4.25**

7570. **Cut Filters, round, Schleicher & Schuell's**, No. 597, thick, white, in packages of 100 filters.

Diam. in mm.	55	70	90	110	125	150	185	240	270	320	385	500
Per package,	**$ .20**	**.25**	**.30**	**.35**	**.40**	**.50**	**.65**	**.90**	**1.25**	**1.75**	**2.25**	**3.75**

7575. **Glass Wool**, for filters, finest, per 30 grams, - - - - **1.00**

7580. **Glass Wool**, for filters, medium, per 30 grams, - - - - **.90**

7600. **Litums Paper**, red, per 100 strips, in sealed vial, - - - - **.10**

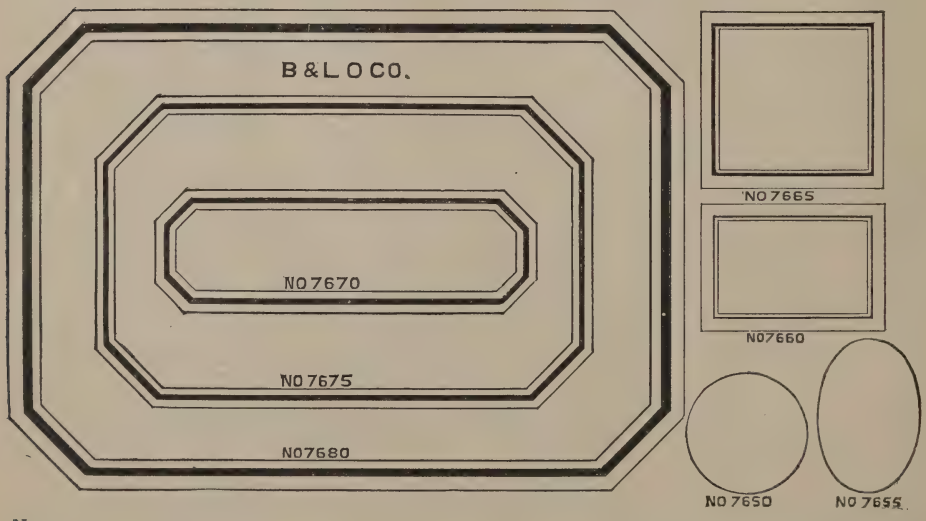
7605. **Litums Paper**, blue, per 100 strips, in sealed vial, - - - - **.10**

7610. **Litums Paper**, neutral, per 100 strips, in sealed vial, - - - **.10**

7615. **Curcuma Paper** (Turmerac), per 100 strips, in sealed vial, - - - **.10**

7620. **Congo Paper**, per 100 strips, in sealed vial, - - - - **.10**

GUMMED LABELS.



No. Per Hundred.

7650. Gummed Labels, white, round, 16 mm., per 100, in box, - - - **.10**

7655. " " " oval, 20 x 14 mm., per 100, in box, - - **.10**

7660. " " " oblong, blue border, 23 x 15 mm., per 100, in box, - **.10**

7665. " " " square, 22 mm, per 100, in box, - - - **.10**

7670. " " " oblong, red border, 50 x 15 mm., per 100, - - **.25**

7675. " " " " " " 65 x 38 mm., per 100, - **.50**

7680. " " " " " " 85 x 65 mm., per 100, - - **.75**

CHEMICALS AND REAGENTS.

In the following list of chemicals only such are included as are most generally used in biologic work. They are of guaranteed quality for the finest work. The prices given **include Containers** except where otherwise stated. When larger quantities than those quoted are desired, please write for our prices, stating amount of each to be purchased.

		30 Grams.	100 Grams.	250 Grams.	500 Grams.
7700.	Acacia (Gum Arabic), powdered,	.15	.30	.50	.85
7701.	Acid, boric (boracic), c. p. cryst.,	.10	.25	.40	.50
7702.	Acid, carbolic, c. p. loose cryst.,	.20	.40	.60	.90
7703.	Acid, chromic, c. p. cryst.,	.25	.50	.75	1.25
7704.	Acid, citric, c. p. cryst.,	.20	.45	.70	1.15
7705.	Acid, lactic, c. p. sp. gr. 1.210,	.25	.60	1.00	1.60
7706.	Acid, osmic (perosmic), per 1 gram capsule,	$1.40			
7707.	Acid, osmic (perosmic), per ½ gram capsule,	.75			
7708.	Acid, oxalic, c. p. cryst.,	.10	.20	.30	.50
7709.	Acid, picric, c. p. cryst.,	.20	.40	.65	1.05
7710.	Acid, pyrogallic, white, resublimed,	.50	1.25	2.40	
7711.	Acid, tannic, c. p.,	.35	.85	1.60	2.50
7712.	Acid, tartaric, c. p.,	.15	.35	.60	1.00
7713.	Alum, ammoniacal, pure, free from iron,	.10	.18	.25	.35
7714.	Alum, chromic, cryst., pure, free from iron,	.10	.20	.30	.40
7715.	Alum, potassic, c. p. cryst.,	.10	.18	.25	.35
7716.	Aluminum, sulphate, c. p. cryst.,	.20	.40	.95	1.20
7717.	Ammonium carbonate, c. p.,	.15	.25	.35	.50
7718.	Ammonium nitrate, c. p. cryst.,	.15	.25	.40	.60
7719.	Borax, cp. cryst. (Sodium biborate),	.10	.20	.30	.50
7720.	Caustic, lunar (Silver nitrate), cryst.,	.75			
7721.	Chalk, prepared (Calcium carbonate prepared),				.10
7722.	Chloral hydrate, loose cryst.,	.25	.65	1.15	1.75
7723.	Cocaine, pure cryst., per gram,	.40			
7724.	Copper acetate, pure cryst.,	.20	.40	.65	1.00
7725.	Copper sulphate and ammonium,	.15	.30	.50	.80
7726.	Copper sulphate, c. p. cryst,,	.10	.20	.30	.40
7727.	Curare, tested, per gram,	.50			
7728.	Dextrin, yellow,				.10
7729.	Dextrose, c. p.,	.30	.75	1.50	2.25
7730.	Gold chloride, in 15 grain vials,	.65			
7731.	Haematin, from blood, per gram,	.50			
7732.	Iodine, resublimed,	.50			
7733.	Iron ferro-cyanide (Prussian blue),	.15	.30	.50	.80
7734.	Lactose (milk sugar), cryst.,	.10	.20	.30	.50
7735.	Laevulose, 10 grams,	.75			
7736.	Lead acetate, c. p. cryst.,	.10	.20	.30	.40

			30 Grams.	100 Grams.	250 Grams.	500 Grams.
7737.	Legumin, 10 grams,	**$1.00**				
7738.	Lithium carbonate, c. p.,	.50				
7739.	Mercury bichloride, recrystallized (corrosive sublimate)		.20	.40	.75	1.20
7740.	Mercury metallic,					.70
7741.	Papayotin, per gram,	.40				
7742.	Petrolatum (Vaselin),		.15			
7743.	Phloroglucin per gram,	.30				
7744.	Platinum bichloride, per gram,	.50				
7745.	Potassium bichromate, pure cryst.,		.10	.20	.30	.40
7746.	Potassium bichromate, c. p. cryst.,		.15	.25	.40	.65
7747.	Potassium bromide, c. p.,		.20	.45	.65	1.10
7748.	Potassium carbonate, c. p.,		.15	.25	.40	.60
7749.	Potassium chlorate, c. p. cryst.,		.15	.25	.40	.60
7750.	Potassium forrocyanide, c. p.,		.20	.40	.65	1.10
7751.	Potassium hydrate, purif. sticks,		.10	.20	.30	.50
7752.	Potassium iodide, c. p. cryst.,		.40			
7753.	Potassium sulphite, c. p.,		.25	.75	1.50	2.50
7754.	Protein, 10 grams,	1.00				
7755.	Silver nitrate, cryst.,		.75			
7756.	Sodium hydrate, pure, sticks,		.10	.20	.30	.50
7757.	Thymol, cryst.,		.35			
7758.	Uranium acetate, pure,		.60			
7759.	Vaselin, white, melting point 43° to 45° C.,		.15			
7760.	Zinc, granulated, free from Fe,					.60
7761.	Zinc chloride, c. p. fused, in sticks,		.15	.30	.50	.75

Prices of the following chemicals are for the chemicals only. Suitable containers will be charged for at cost. When larger quantities than listed are desired, please write for our prices stating amount of each to be purchased.

		30 cc.	100 cc.	250 cc.	500 cc.
7762.	Acid, acetic, glacial, 99%,	.15	.25	.40	.60
7763.	Acid, carbolic,				.15
7764.	Acid, formic, pure, sp. g. 1.060,	.20	.40	.60	.80
7765.	Acid, hydrochloric (muriatic), c. p., sp. gr. 1.180,				.20
7766.	Acid, hydrofluoric, fuming, c. p., incl.,	.45			
7767.	Acid, nitric, c. p., sp. gr., 1.425,				.25
7768.	Acid, picrio-nitric,	.15	.30	.50	.75
7769.	Acid, sulphuric, c. p., sp. gr., 1.840,				.20
7770.	Benzole, c. p. sp. gr., 0.880,	.10	.20	.30	.40
7771.	Chloroform, Dr. Squibbs',			1.50	2.50
7772.	Chloroform, pure,			.50	.85
7773.	Creosote, beechwood, pure,	.25	.50	1.00	1.50

		30 cc.	100 cc.	250 cc.	500 cc.
7774.	Ether, Dr. Squibbs',			**1.25**	**2.25**
7775.	Ether, sulphuric, pure, sp. gr. 0.722,	**.40**	**.60**	**.90**	
7776.	Fehlings' Solution, elements, either,	**.20**	**.50**	**1.00**	
7777.	Fibrin, from blood, 5 gram vial, **$.75**				
7778.	Pyridin, c. p.,	**.30**	**.75**	**1.75**	**3.00**
7779.	Toluol, c. p.,	**.30**	**.75**	**1.60**	**2.75**
7780.	Xylol, c. p.,	**.25**	**.65**	**1.15**	**1.75**
7781.	Alcohol Absolute, Dr. Squibbs,				**1.60**
7782.	Alcohol, absolute,	**.20**	**.40**	**.65**	**1.00**
7783.	Alcohol, 95%,				**.60**
7784.	Alcohol (Ranviers),				**.40**
7785.	Alcohol, methylic, 90%,				**.30**
7786.	Ammonia, aq., sp. gr., 0.960,				**.25**
7787.	Formaldehyde, 40%,			**.50**	**.75**
7788.	Formaline, Schering.				**1.50**
7789.	Formalosa, 40%,			**.50**	**.75**
7790.	Glycerine,	**.15**	**.30**	**.50**	**.75**
7791.	Nicotin, 5 gram vial, **1.00**				
7792.	Oil, anilin,	**.15**	**.30**	**.50**	**.75**
7793.	Oil, bergamot (Schimmel),	**.35**	**1.00**	**2.25**	
7794.	Oil, cedar wood (Schimmel), for clearing,	**.15**	**.40**	**.75**	**1.50**
7795.	Oil, cedar wood, for immersion objectives,	**.40**	**1.00**	**2.00**	
7796.	Oil, cloves (Schimmel),	**.15**	**.40**	**.75**	**1.25**
7797.	Oil, lavender, French, extra fine,	**.30**	**.75**	**1.50**	**3.00**
7798.	Oil, origanum, commercial (Schimmel),	**.10**	**.25**	**.40**	**.60**
7799.	Oil, origanum, cretian (Schimmel),	**.60**			
7800.	Oil, santal wood, East Indian (Schimmel),	**.75**			
7801.	Oil, thyme, white, German,	**.15**	**.40**	**.75**	**1.25**
7802.	Oil, turpentine, redistilled for clearing,	**.15**	**.25**	**.40**	**.60**

MEDIA FOR MOUNTING MICROSCOPIC OBJECTS AND FOR FINISHING MOUNTS.

7804.	Asphaltum,	**.25**	**.60**	**1.25**	**2.00**
7805.	Asphaltum, quick drying,	**.35**			
7806.	Balsam, Canada, powdered, 500 grams,				**3,00**
7807.	Balsam, Canada, natural, paper filtered,				**2.75**
7808.	Balsam, Canada, natural, paper filtered, in 20 cc, collapsable tubes, each, **.20**				
7809.	Balsam, Canada, dissolved in Benzole,	**.40**	**1.00**	**2.50**	**4.25**
7810.	Balsam, Canada, dissolved in Chloroform,	**.40**	**1.15**	**2.65**	**5.00**

No.		30 cc.	100 cc.	250 cc.	500 cc.
7811.	Balsam, Canada, in Xylol,	.40	1.15	2.65	5.00
7812.	Balsam, Canada, in Xylol, in 20 cc. tubes, .20				
7813.	Balsam, Damar in benzole,	.40	.90	1.85	3.50
7814.	Bell's Microscopical Cement,	.50			
7815.	Brown's Transparent Rubber Cement,	.35			
7816.	Brunswick Black,	.25	.60	1.25	2.00
7817.	Deane's Medium,	.35			
7818.	Farrant's Medium,	.50			
7819.	Gold Size,	.25	.60	1.25	2.00
7820.	Glycerine, camphorated,	.25			
7821.	Glycerine, Jelly,	.50			
7822.	Hollis' Glue,	.30			
7823.	King's Amber Cement, 15 cc. bottle, .25				
7824.	King's White Cement, 15 cc. bottle, .25				
7825.	King's Lacquer Cell and Finish, blue,	.50			
7826.	King's Lacquer Cell and Finish, scarlet,	.50			
7827.	Marine Glue, colorless,	.40			
7828.	Marine Glue, fluid,	.30	.80	1.75	3.25
7829.	Marine Glue, hard, melting point, 120° C, 30 grams. .25				
7830.	Meyer's Albumen Fixative,	.25	.65	1.50	2.60
7831.	White Zinc Cement,	.40			

IMBEDDING AND INJECTING SUBSTANCES.

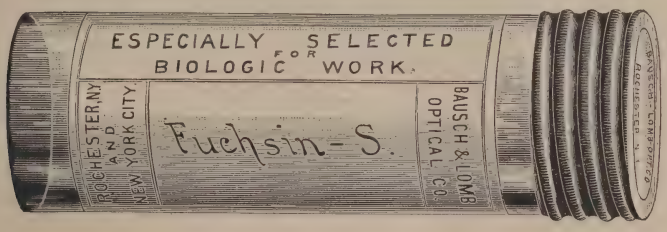
		30 grams.	60 grams.	100 grams.	250 grams.	500 grams.
7832.	Berlin, Blue, commercial, for coloring injecting mass,	.30	.50	.75	1.50	2.75
7833.	Berlin, Blue, easily soluble,	.30	.50	.75	1.75	3.25
7834.	Carmine Injecting Gelatine (Dr. Seiler's), dry,	1.40				
7835.	Celloidin (Shering's), in shreds,	1.25				
7836.	Celloidin (Schering's), granulated,	1.30				
7837.	Paraffin, melting point, 43° C, in tin boxes,					.35
7838.	Paraffin, melting point, 54° C, in tin boxes,					.40
7839.	Paraffin, melting point, 43° C, wrapped in cakes,					.20
7840.	Paraffin, melting point, 54° C, wrapped in cakes,					.25
7841.	Paraffin, melting point, 71° C, wrapped in cakes,					.30
7842.	Pith for sectioning, per package, .10					
7843.	Prussian Blue,	.20	.35	.50	1.00	1.50
7844.	Vermillion, best English,	.30	.50	.60	1.25	2.25

NUTRIENT SUBSTANCES AND COTTON FOR BACTERIOLOGICAL WORK.

7845.	Agar-Agar, best quality, in shreds,			1.00
7846.	Beef Extract (Liebig's), in quarter pound cans,	1 can,	1.25	
7847.	Gelatin, best German, gold label,			.90
7848.	Peptonum Siccum (Witte's), in 125 grams. bottles,	1 bottle,	1.00	
7849.	Cotton wool for plugging test tubes,	per pound package,	.40	

STAINING MATERIAL.

The Anilin Stains listed below are not the ordinary anilins, but are especially selected for biologic work. They are put up in vials of amber glass, with screw cap (excluding the light and preventing degeneration of the crystals from its action), each one bearing our firm name. We procure our anilins direct from the manufacturers, and furnish only such as have been proven by actual test to be suited to the needs of the biologist.

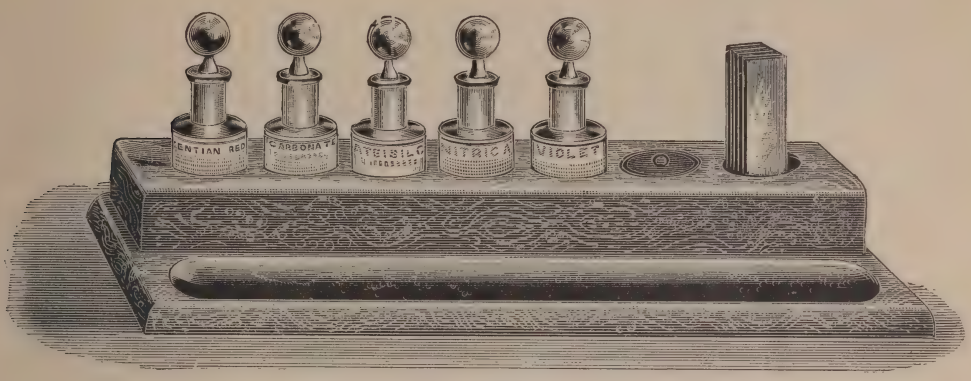


We will send sample vial of any of our anilins on receipt of ten cents, to pay for postage and packing.

Set of 10, ten-gram vials, of the most useful anilins, dry, in case, - - **$3.25**
Set of 20, ten-gram vials, of the most useful anilins, dry, in case, - - **6.25**

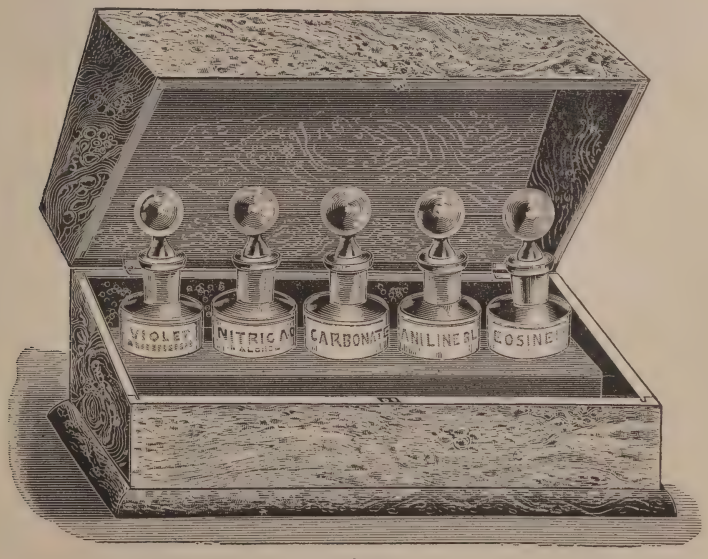
	DRY.							SOLUTION.		
	1 gram.	*3* grams	*10* grams	*30* grams	*60* grams	*100* grams	*250* grams	*30* cc.	*100* cc.	*500* .cc
7850. Ammonia carmine (Beale's), -								.25	.75	3.00
7851. Anilin black (Nigrosin), -			.20	.40	.60	.80	1.75	.20	.35	.75
7852. Anilin blue, - - - - -			.25	.50	.90	1.40	3.25	.25	.50	1.00
7853. Anilin blue-black, - -			.20	.40	.65	.95	2.00	.20	.35	.75
7854. Anilin green, - - - -			.20	.35	.60	.85	1.75	.20	.35	.75
7855. Anilin red, - - - -			.20	.30	.45	.60	1.25	.20	.35	.75
7856. Anilin violet, - - - - -			.25	.50	.80	1.25	3.00	.25	.40	.90
7857. Bengal rose, - - - -		.20	.40	.90	1.65			.30	.60	1.35
7858. Benzoazurin, - - - - -			.20	.40	.65	1.00	2.25	.20	.40	.75
7859. Benzo purpurin, - - -			.20	.40	.65	1.00	2.25	.20	.40	.75
7860. Biebrich scarlet, - - -			.20	.40	.65	1.00	2.25	.20	.40	.75
7861. Bismark brown, - - -			.20	.40	.60	.85	1.75	.20	.40	.75
7862. Blue lumiere, - - - -		.20	.40	.90	1.65			.30	.60	1.35
7863. Borax carmine (Grenacher's),								.35	1.00	4.00
7864. Burrill's stain for Tubercle Bacilli, - - - - -								.40	1.20	5.00
7865. Carmine, Lithium (Orth's). -								.40	1.80	5.00
7866. Carmine, No. 40, - - -			.30	.60	1.00	1.60	3.75			
7867. Carminic acid, pure, - -		.75								
7868. Chenzinskie's eosin-methylen blue, - 60 cc. bottle, 60										
7869. Chrysoidin, - - - -			.20	.40	.65	1.00	2.00	.20	.40	.75
7870. Congo red, - - - - -			.20	.40	.65	1.00	2.00	.20	.40	.75
7871. Corallin, - - - - -			.20	.35	.60	.80	1.75	.20	.35	.70
7872. Delta purpurin, - - - -			.20	.40	.70	1.00	2.30	.20	.40	.80
7873. Dahlia violet, - - - -			.20	.40	.65	1.00	2.00	.20	.40	.80

No.	DRY. 1 gram.	3 grams	10 grams	30 grams	60 grams	100 grams	250 grams	SOLUTION. 30 cc.	100 cc.	500 cc.
7874. Eosin, yellowish,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7874b. Eosin, bluish,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7875. Ehrlich-Biondi-Heidenhain triple mixture,		.75	2.25	6.00						
7876. Ehrlich's neutrophile stain, for blood, 60cc bottle, 60 cents.										
7877. Fuchsin,			.20	.40	.65	1.00	2.00	.20	.40	.75
7878. Fuchsin, acid,			.25	.50	.90	1.50	3.25	.25	.45	.90
7879. Gibbe's double stain, for Tubercle Bacilli,								.35	1.00	4.00
7880. Gentian violet,			.30	.60	1.00	1.60	3.75	.25	.50	1.00
7881. Gold orange,			.20	.35	.50	.75	1.30	.20	.35	.70
7882. Haematein, cryst,	.30									
7883. Haematoxylin, pure cryst.		.50	1.40	4.00						
7884. Haematoxylin (Delafield's),								.25	.75	3.00
7885. Haematoxylin (Grenacher's),								.25	.75	3.00
7886. Iodine green,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7887. Indigo carmine,			.20	.40	.70	1.00	2.30			
7888. Indulin,			.20	.40	.60	.80	1.75	.20	.35	.70
7889. Loeffler's alkaline blue,								.25	.75	3.00
7890. Magdala red,	.40	1.10	3.50							
7891. Magenta,			.20	.40	.65	.95	2.00	.20	.40	.75
7892. Malachite green,			.20	.40	.60	.80	1.75	.20	.35	.70
7893. Metanil yellow.			.20	.40	.60	.85	1.85	.20	.35	.75
7894. Methyl blue,		.20	.40	.90	1.65			.30	.65	1.50
7895. Methyl green,		.20	.40	.95	1.75	2.85		.30	.65	1.50
7896. Methyl violet,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7897. Methylen blue,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7898. Methylen blue, for intra vitem staining, c. p.,			.50	1.50						
7899. Orange B, napthol,			.20	.30	.45	.65	1.30	.20	.35	.70
7900. Orange G,			.20	.30	.45	.65	1.30	.20	.35	.70
7901. Orange II,			.20	.30	.45	.65	1.30	.20	.35	.70
7902. Orseille G.			.20	.30	.45	.65	1.30	.20	.35	.70
7903. Picro carmine (Weigerts'),		.40	1.15	3.00				.50	1.50	
7904. Rocellin,			.20	.30	.45	.65	1.30	.20	.35	.70
7905. Rosein,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7906. Rosaniln hydrochlorid,			.30	.75	1.40			.25	.50	1.00
7907. Rubin G,			.20	.40	.65	1.00	2.00	.20	.40	.75
7908. Rubin S,		.25	.60	1.50	3.00			.40	.90	2.25
7909. Saffranin,			.30	.65	1.15	1.80	4.25	.25	.50	1.25
7910. Solferino,			.30	.60	1.00	1.50	3.50	.25	.50	1.00
7911. Solid green,			.20	.40	.60	.85	1.85	.20	.35	.75
7712. Sulphindigotate of soda (Indigo carmine),			.20	.40	.70	1.00	2.30			
7913. Sodium carminate (Schultze's),	.30	.80	2.50							
7914. Tropeolin, 000, No. 2,			.20	.30	.45	.65	1.30	.20	.30	.65
7915. Vesuvin,			.20	.40	.65	.95	2.00	.20	.40	.75
7916. Victoria blue,			.25	.50	.85	1.30	3.00	.25	.40	.75
7917. Violet B,			.20	.40	.65	.95	2.00	.20	.40	.75
7918. Ziehl's carbol fuchsin,								.25	.75	3.00



No. **8000.**

No.		Price
8000.	**Reagent Case**, of wood, highly finished and fitted with five reagent bottles No. 4360, labeled for the accompanying reagents, and with receptacles for cover glass, glass slips, section lifter, forceps, scalpel, scissors, etc., also 30 cc of each of the following reagents: Delafield's Haematoxylin, Eosin, Fuchsin S. Absolute alcohol, Oil cloves. Price, complete, each,	**3.00**
8001.	**Reagent Case**, as described above, but without the reagents and labels for bottles, each,	**2.00**

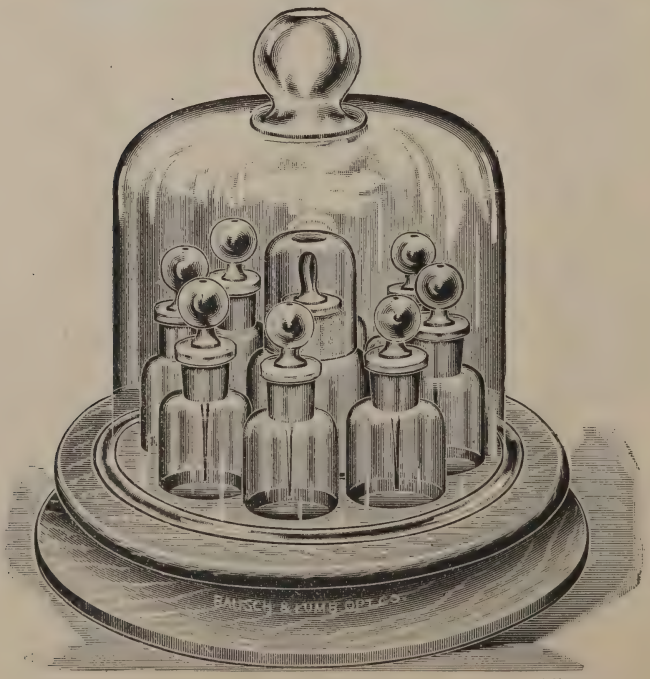


No. **8005.**

8005. **Reagent Case**, of highly finished wood, with cover and lock with key. This case contains five reagent bottles, No. 4360, labeled to correspond with the accompanying reagents which are the same as supplied with No. 8010. In addition to the bottles there is space arranged for mounting instruments, section lifter, scissors, brushes, scalpel, etc.
Price, complete, each, **4.50**

8006. **Reagent Case**, as described above, but without reagents, each, and labels for bottles, **3.50**

REAGENT CASE. No. **8010.**



LABORATORY REAGENT CASE. No. **8015.**

No. Price.

8010. Reagent Case, highly polished and with lock and key, and contains 15 bottles No. 4360, labeled to correspond with reagents as follows: 30 cc. of each being furnished in separate bottles,—Gentian violet, Bismarck brown, Fuchsin, Methyl blue, Eosin, Delafields Hæmatoxylin, Nitric acid in Alcohol (3%), Iodo-iodide Potassa (3% sol.), Caustic potash (5% sol.), Potassium ferro cyanide with 1 per cent Acetic acid, Absolute alcohol, Turpentine oil, Cedar Oil. In addition to the reagent bottles there is a receptacle for scalpels, scissors, section lifter, forceps, brushes, labels, etc., price, each, complete, - - - **$10.75**

8011. Reagent Case, as described above but without the reagents and without labels for the bottles, each, - - - - **7.75**

8012. Reagent Case, same as No. 8011 but with bottles No. 4355 instead of No. 4360, each, - - - - - - **8.50**

8015. Laboratory Reagent Case. This case is intended to be a practical working accessory for the use of students in the laboratory. It consists of a nicely finished wood base with groove for flange of bell jar, and with nine cavities for reagent bottles. Eight bottles No. 4360 for reagents and one bottle No. 4340 with glass cap, for Canada Balsam are supplied with the case, also a bell jar No. 4500, 180 x 155 mm., which may be used to protect the bottles from dust when not in use, and, which may also be used independently if desired. Price of case, complete, each, **3.00**

8016. Laboratory Reagent Case, fitted with bottles No. 4355 instead of No. 4360, each, - - - - - - **3.40**

A CLASSIFIED LIST OF

First Class Microscopic Objects.

In revising this list and classifying the subjects and studies represented, we have been guided altogether by the demand of past years, and only enumerate such preparations as are most generally called for by the busy microscopist who has not the time to prepare them himself. We have arranged with reliable and, in their line of study, representative parties to prepare these objects for us, and we offer only the very best obtainable. It shall be our endeavor to carry this stock as complete as possible, though we cannot guarantee to complete an order on account of the impossibility at times of obtaining the proper material for the preparations. When we are out of stock we try to procure the missing slides in the market. When an order is not filled complete it may be taken for granted that the slides not sent are not obtainable. It will give us pleasure to send out a reasonable number of objects for examination and selection to any person, those unknown to us giving good references, with the understanding that the cost of transportation and loss by breakage be borne by the purchaser.

We preface the Educational Series with remarks to which we call attention. In many instances these preparations will fill all requirements for purposes of demonstration, and we can recommend them as giving satisfaction.

All subjects classified are considered typical slides in their respective series.

For convenience to the purchaser and to save considerable writing, order the slides by their catalogue number and serial numbers only.

NORMAL HISTOLOGY

COMPARATIVE.

No. **9000.** Each, **60** cents.

1. Skin stained, showing sweat glands.
2. Lip of Cat, injected and stained, showing erectile hair follicles.
3. Tongue of Cat, injected and stained, showing muscles and papillæ.
4. Tongue of Rabbit, stained.
5. Ear of Kitten, injected and stained.
6. Oesophagus of Dog, stained.
7. Stomach of Cat, injected and stained.
8. Duodenum of Cat, stained.
9. Pancreas of Cat, stained.
10. Colon of Cat, stained.
11. Liver of Pig, double stained.
12. Trachea of Dog, stained.
13. Lung of Cat, stained.
14. Lung of Monkey, stained.
15. Heart of Cat, stained.
16. Spleen of Rabbit, stained.
17. Liver of Monkey, double stained.
18. Liver of Cat, injected.
19. Lymphatic gland, Calf, stained.
20. Spleen of Cat, stained.
21. Thymus Body of Calf, stained.
22. Thyroid Gland of Dog, stained.
23. Kidney of Cat, injected and stained.
24. Kidney of Rabbit, stained.
25. Kidney of Amphiuma, double stained.
26. Bladder of Cat, stained.
27. Ovary of Kitten, stained.
28. Uterus of Cat, stained.
29. Testicle of Rabbit, showing spermatozoa.
30. Testicle of Amphiuma, double stained, showing spermatazoa in situ.
31. Muscle of Cat, injected.
32. Liver of Rabbit, stained.
33. Spinal Ganglion of Calf, stained.
34. Spinal Cord of Dog, stained.
35. Cerebellum of Rabbit, stained.
36. Cerebrum of Cat, injected and stained.

No. **9001,** the entire set of 36 preparations, in cabinet, - - - **$21.00**

NORMAL HISTOLOGY.

HUMAN.

No. **9005.** Each, **60** cents.

1. Bone, Adult, Longitudinal.
2. Bone, Adult, Transverse.
3. Bone, Developing.
4. Brain, Cerebellum.
5. Brain, Cerebrum.
6. Cartilage, Hyaline.
7. Crystalline Lens.
8. Fingernail.
9. Heart.
10. Intestine, small.
11. Kidney, injected.
12. Kidney, normal.
13. Liver, normal.
14. Lung, normal.
15. Membrane, Mucous.
16. Membrane, Serous.
17. Muscle, Striated.
18. Muscle, Unstriated.
19. Nerve Cells.
20. Nerve Fibres.
21. Oesophagus.
22. Optic Nerve, Trans. Sect.
23. Ovary.
24. Scalp, Caucasian.
25. Scalp, Negro.
26. Skin, African.
27. Skin, Caucasian.
28. Spinal Cord, Trans. Sect.
29. Spinal Cord, Long. Sect.
30. Stomach.
31. Thyroid Lymphatic gland.
32. Tissue, Adipose.
33. Tissue, Embryonal, Connective.
34. Tissue, Yellow, elastic.
35. Tooth, Longitudinal.
36. Tooth, Transverse.
37. Large, Intestine.
38. Mammary Gland.
39. Medulla Oblongata.
40. Nipple.
41. Pancreas.
42. Spleen.
43. Supra Renal Capsule.
44. Testicle.
45. Thymus Gland.
46. Uterus.
47. Vagina.
48. Bronchial Gland.

No. **9006,** the entire set of 48 preparations in cabinet, - , - - **$30.00**

PATHOLOGICAL ORGAN SERIES.

No. **9010.** Each, **60** cents.

1. Lung, Croupous Pneumonia. First Stage.
2. " " " Second Stage.
3. " " " Third Stage.
4. " Pleuro Pneumonia.
5. " Acute Catarrhal Pneumonia.
6. " Chronic Catarrhal or Caseous Pneumonia.
7. " Acute Miliary Tuberculosis.
8. " Tubercular Node-Bacilli in Giant Cells.
9. " Fibroid Phthisis.
10. " Anthracosis.
11. " Emphysema.
12. " Hemorrhagic Infarction.
13. Liver, Fatty Infiltration.
14. " " Degeneration, Yellow Atrophy.
15. " Amyloid degeneration.
16. " Cirrhosis.
17. " Red Atrophy (Nutmeg.).
18. Liver, Miliary Tuberculosis.
19. Spleen, Amyloid degeneration (Sage).
20. " Hodgkin's disease.
21. Heart, fatty degeneration.
22. Spleen, Acute Miliary Tuberculosis.
23. " Pigmentation.
24. Kidney, Acute Catarrhal Nephritis.
25. " Chronic Catarrhal Nephritis.
26. " Interstitial Nephritis.
27. " Amyloid degeneration.
28. " Acute Miliary Tuberculosis.
29. Intestine Typhoid Ulcer.
30. " Follicular Enteritis.
31. Spinal Cord, Myelitis, traumatic.
32. " Sclerosis.
33. Cerebrum, Atrophy.
34. Testicle, Acute Miliary Tuberculosis.
35. Supra Renal Capsule, Addison's disease.
36. Skin, Leprosy, showing Bacilli.

No. **9011.** The entire set of 36 preparations, in cabinet, - - - - **$21.00**

TUMOR SERIES.

No. **9015.** Each, **60** cents.

1. Lipoma.
2. Fibroma, Hard.
3. Fibroma, Soft.
4. Fibroma, Neuro.
5. Chondroma.
6. Myxoma.
7. Myoma, Leio.
8. Myoma, Rhabdo.
9. Neuroma, Medulated.
10. Glioma.
11. Angioma.
12. Papilloma, Soft.
13. Adenoma, Glandular.
14. Adenoma, Columnar Celled.
15. Adenoma, Sebaceous.
16. Adenoma, Fibro.
17. Lymphoma.
18. Chancre, Hard.
19. Gumma.
20. Sarcoma, Small Round Cell.
21. " Large Round Cell.
22. " Small Spindle Cell.
23. " Large Spindle Cell.
24. " Alveolar.
25. " Giant Cell.
26. " Lympho.
27. " Chondro.
28. " Fibro.
29. " Melanotic.
30. Adeno Carcinoma.
31. Epithelioma, Squamous.
32. Epithelioma, Cylindrical.
33. Cancer, Hard.
34. Cancer, Soft.
35. Cancer, Endothelial.
36. Cancer, Melanotic.

No. **9016.** The entire set of 36 preparations, in cabinet, - - - - - **21.00**

NORMAL SERIES OF THE NERVOUS SYSTEM.

No. **9020.** Each, **$1.50.**

All the sections, unless otherwise indicated, are stained by Weigert's method and are mounted on ordinary slides. Sections 13, 14, 15, 16 and 17 are mounted on large slides three by two inches. These sections have been selected with a view to accompany a set of lectures for demonstrations of the nervous system such as is given at the Universities or Medical Colleges and the order given is systematically arranged so as present a very fair idea of the architecture of the nervous system.

1. Section of the first lumbar segment of the spinal cord.
2. Section of the eighth cervical, stained by Van Gieson's method.
3. Section of the spinal cord of an embryo chick of the sixth and seventh day, stained by Golgi's method, showing the collaterals of the posterior root fibres.
4. Section of embryo chick at the eighth day, showing the commissural cells, anterior horn cells, and fundamental column fibres of the spinal cord.
5. Longitudinal section of the spinal cord of embryo chick, seventh day, Golgi's method, which shows collaterals entering the gray matter from the fundamental column fibres.
6. Section of human spinal cord with secondary degenerations. This section exhibits the column of Gall, column of Gowers and the direct cerebellum tract affected by secondary ascending degenerations.
7. Section of the human spinal cord affected by descending secondary degenerations. This section shows column of Türck and crossed pyramidal tract.
8. Section of human spinal cord at the level of the decussation of the pyramids.
9. Section at the beginning of the medulla oblongata. This section shows the sensory decussation and the nuclei of the posterior columns.
10. Section of medulla oblongata at the upper level of the sensory decussation.
11. Section of medulla at the level of the beginning of the fourth ventricle. This section shows the olivary bodies, pyramids, root fibres of the twelfth nerve, arcuate fibres, etc.
12. Section of medulla at the mid-olivary region, shows the root fibres of the tenth nerve.
13. Section of the medulla at the upper olivary region, shows the root fibres of the ninth and tenth nerves.
14. Section at the junction of the medulla and pons, shows the root fibres of the eighth nerve.
15. Section of the pons verolii at the level of the sixth and seventh nerves. This section shows the nuclei and intramedullary fibres of the sixth and seventh nerves, and also includes a portion of the cerebellum which shows the passage of the corpus restiforme into the cerebellum.
16. Section of the pons at the level of the fifth nerve.
17. Section of the pons at the level of the fourth nerve.
18. Section of the crura cerebri, shows origin and fibres of the third nerve.
19. Section of the cortex brain of a new born mouse, stained by Golgi's method, showing ganglion cells and neurons terminating free in the cerebral cortex.

PATHOLOGICAL SERIES OF THE NERVOUS SYSTEM.

No. **9025.** Each, **$1.50.**

1. Peripheral neuritis, teased osmic acid preparation.
2. Meningitis spinalis, transverse section of the spinal cord with membranes stained by Van Giesen's method.
3. Acute myelites, transverse section of the spinal cord, stained ditto.
4. Polio myelites, from a case twenty years at the acute onset of the symptoms, transverse sections of the cervical enlargement, stained either by Weigert's method or Van Giesen's method, as desired.
5. Degeneration of the anterior horn cells of the spinal cord, illustrating the results of toxaemia, sections of the rabbit's spinal cord in experimental hydrophobia or from the human spinal cord in a case of hydrophobia, stained by Nissl's method.
6. Syringo myelia, trans sections of the human spinal cord, stained by VanGiesen's method.
7. Locomotor attaxia, stained by Weigert's method.
8. Glioma of the spinal cord.
9. Hemorrhage at the spinal cord, stained by Van Giesen's method.
10. Progressive muscular atrophy, Van Giesen's method.
11. Acute menengitis cerebralis, section of convolution of the brain showing the exudation in the piamater.
12. Section of the brain cortex and general paresis of the insane, Nissl's method.
13. Ditto. Weigert's method.
14. Section of an atrophic convolution.
15. Section of a softened convolution, Nissl's method.

No. **9030.** The entire series of 34 sections, in cabinet, - - - - - **$51.50**

HUMAN EMBRYO SERIES.

No. **9035.** Each, **$1.00.**

These sections are from Human Embryos of about 52 days growth, 56 mm. measurement, are all cut the $\frac{1}{1000}$ of an inch in thickness, stained with borax carmine, and mounted upon the best quality of glass, single section to the slide. Four sections are represented from the Head, fourteen from the Trunk, and one each from the Hand, Foot, Knee joint, Elbow joint, Umbilical Cord and Placenta. The sections from the Head and Trunk are approximately 62 micr. distant from each other. A brief description of what each slide exhibits is as follows:

1. External lateral section of head near the region of ear, and lateral aspect of brain.
2. 62 micr. further inward than No. 1, showing large and small brain, eye complete, and cartilaginous formation of cranium.
3. Near the inner angle of orbit, displaying part of eye, large area of brain, and part of nasal and oral cavities.
4. Approximately an axial section,—displaying brain, nasal and oral cavities, and cranial formation.
5. Through upper cervical region, displaying formation of vertebra, spinal cord and membranes, muscular formation, part of arm, œsophagus, apex of lung, etc.
6. Displays same features as preceding,—œsophagus, trachea, and parts of upper extremity.
7. Same as preceding, with sternum articulations displayed.
8. Showing superficial area of lungs, and same features as the preceding.
9. Larger area of lung, superior plane of heart, showing the cavities and large vessels, large bronchia of lungs, long axis of rib formation, bronchial glands, etc.
10. Deeper plane of heart, increased area of lung, thoracic vessels, in addition to all features presented in the preceding series.
11. Lungs, ribs, heart, small plane of liver and stomach, and peritoneum.
12. Plane through large extent of liver and base of lung.
13. Through broad plane of liver and stomach walls.
14. Showing liver, small field of intestine, superficial part of kidney and peritoneum.
15. Lower border of liver, larger plane of intestine and deeper area of kidney.
16. Intestinal area, scant field of liver, entrance of umbilical cord.
17. Chiefly view of intestine, umbilical cord, abdominal walls, etc.
18. Final section through trunk, displaying abdominal wall, spinal cord, membranes, body and processes of vertebra, bladder, rectum, pelvic formation, scrotum, small portion of attached lower extremity, muscular attachments, etc.
19. Longitudinal section through hand, displaying bones of forearm, metacarpal, carpal, phalangeal and muscular and cutaneous formation.
20. Section showing plane of foot, displaying bones in a cartilaginous state and muscular and cutaneous formation.
21. Approximately an axial section through elbow joint, with half of upper and lower arm.
22. Approximately an axial section through knee joint, with half of upper and lower leg.
23. Umbilical cord, transverse section.
24. Placenta.

No. **9036.** The entire set of 24 preparations, in cabinet, - - - - **$24.50**

BACTERIOLOGICAL SERIES

No. **9040.** Each, **85** cents.

NON PATHOGENIC.

1. Bacillus, acidi lactici, culture.
2. " butyricus, culture.
3. " cyanogenus (Blue milk B), culture.
4. " fluorescens, culture.
5. " megaterium, culture.
6. " mesentericus vulgatus (Potato Bac.), culture.
7. " oxytocus perniciosus, culture.
8. " ramosus (Root Bac.), culture.
9. " ruber, culture.
10. " " of Kiel, culture.
11. " subtilis (Hay Bac.), culture.
12. " violaceus of water, culture.
13. " indicus, culture.
14. Bacterium zopfiii, cultute.
15. Micrococcus prodigiosus, culture,
16. Phosphorescing Bacillus, culture.
17. Proteus vulgaris, culture.
18. Sarcina aurantiaca (Orange Sarcine), culture.
19. Sarcina lutea (Yellow Sarcine), culture.
20. Spirillum rubrum, culture.
21. Black yeast, culture.
22. Red yeast, culture.
23. White yeast, culture.
24. Saccharomyces cerevisiæ, culture.
25. Oidium lactis, culture.

PATHOGENIC.

26. Achorion schoensteinii (Favus), culture.
27. Actinomyces hominis (Lumpy-Jaw), culture.
28. Bacillus anthracis, culture.
29. " Blood of Guinea-pig (Gram's method).
30. " Colonies, culture.
31. " Kidney of Guinea-pig, section.
32. " Liver " "
33. " Spleen " "
34. " Threads and Spores, culture.
35. " cavicida, culture.
36. " coli communis, culture.
37. " of chicken cholera, culture.
38. " of glanders, culture.
39. " of green pus, culture.
40. " of hog erysipelas, culture.
41. " of malignant œdema, culture.
42. " of swine plague (Am.), culture.
43. " of symptomatic anthrax, culture.
44. " of tetanus, culture.
45. " of leprosy in skin, section.
46. " ribbert, culture.
47. " of Texas fever, culture.
48. " tuberculosis, in human lung, section.
49. " " from lung cavity.
50. Bacillus teberculosis, pure culture.
51. " " in sputum.
52. Comma Bacillus (Asiatic Cholera), culture.
53. Deneke's Bacillus, culture.
54. Eberth's Bacillus of typhoid fever, culture.
55. Emmerich's Bacillus, culture.
56. Finkler-Prior's Bacillus, culture.
57. Fraenkrl's Pneumococcus, culture.
58. Friedlaender's Pneumobacillus, culture.
59. Gonococcus.
60. Loeffler's Diptheria Bacillus, culture.
61. Micrococcus tetragenus, culture.
62. " trachoma, culture.
63. Monilia candida, culture.
64. Mouse septicaemia Bacillus, culture.
65. Rabbit " " "
66. Bacillus of rhinoscleroma, culture.
67. Spirilli and Vibriones, from mouth.
68. Staphylococcus pyogenes albus, culture.
69. " " aureus, culture.
70. Streptococcus erysipelatis, culture.
71. " pyogenes, culture.
72. Vibrio metschnikovi, culture.

No. **9041.** The entire set of 72 preparations in polished cherry cabinet, - - **$62.00**

BLOOD, SPERMATOZOA AND URINARY DEPOSITS.

No. **9045.** Each, **60** cents.

1. Spermatozoa, Man.
2. " Fish.
3. Urinary Deposits, Amorphus Phosphates.
4. " " " Urates.
5. " " Carbonate of Lime.
6. " " Epithelium.
7. " " Leucine.
8. " " Murexide.
9. " " Nitrate of Urea.
10. " " Oil Globules.
11. " " Oxalate of Lime, Dumb-bells.
12. Urinary Deposits, Oxalate of Lime, Octahedral.
13. Urinary Deposits, Phosphate of Lime.
14. Urinary Deposits, Pus.
15. " " Triple Phosphate.
16. Urinary Deposits, Tube Casts.
17. " " Tyrosine.
18. " " Urate of Ammonia.
19. " " Urate of Soda.
20. " " Urea.
21. " " Uric Acid.
22. " " Yeast Plant from Diabetic Urine.
23. Blood Discs, double staned, Pigeon.
24. " " " " Chicken.
25. " " " " Necturus.
26. " " " " Newt.
27. " " " " Goldfish.
28. " " " " Amphiuma (unstained).
29. Blood Discs, Human.
30. " " Frog.

No. **9046.** The entire set of 30 preparations, in cabinet, - - - - **$18.50**

PARASITES.

No. **9050.**

1. Bed-Bug, Cimex lectularius, Male, $.50
2. " " " Female, - .50
3. Body Louse, Pediculus vestimenti, .50
4. Crab Louse, Pediculus pubis, Male, - .50
5. " " " " Female, .50
6. Face Parasite, Demodex folliculorum, .50
7. Flea of Cat, Pulex felis, - - .50
8. " Dog, Pulex canis, - - .50
9. Flea of Man, Pulex irritans, Male, .50
10. " " " " Female, - .50
11. Head Louse, Pediculus capitis, Male, .50
12. Head Louse, Pediculus capitas, Female, .50
13. Itch Mite; Sarcoptes scabiei, - 1.00
14. " " " " Male, Female and larva, - - - 2.50
15. House Fly, - - - - .50
16. Sheep Tick, Melophagus ovinus, - .50
17. Cysticercus vesiculosus, - - .75
18. Hydatid, ftom liver of Man, - .75
19. Oxyurus vermicularis, - - - .75
20. Trichina spiralis encysted, - - .75
21. " " " free, - .75

PARTS OF INSECTS.

No. **9055.** Each, **50** cents.

1. Antenna, Blow Fly.
2. " Butterfly.
3. " Gnat (Mosquito).
4. Eggs, Butterfly.
5. Eyes, Drone Fly.
6. " Green Head Fly.
7. " House Fly.
8. Foot, Green Head Fly.
9. " Spider.
10. " Water Beetle.
11. Gizzard, Cockroach.
12. " Cricket.
13. Head, Blow Fly.
14. " Mosquito, Male, (showing Antennæ).
15. " " Female,(showing Lancets).
16. Lancets, Green Head Fly.
17. " Ox Fly.
18. Leg and Foot, Blow Fly.
19. " " " Honey Bee.
20. " " " Ox Fly.
21. " " " Spider.
22. Mouth Parts, Honey Bee.
23. Proboscis, Blow Fly, (75 cents).
24. Proboscis, Bumble Bee.
25. " Honey Bee.
26. " House Fly.
27. " Green Head Fly.
28. Scales, Butterfly.
29. " Mosquito.
30. " Moth.
31. " Lipisma saccharina.
32. " Podura
33. Skin, Caterpillar.
34. Spinnerets, Spider.
35. Spiracle, Blow Fly.
36. " Cricket.
37. " Tomato Worm.
38. Sting, Bumble Bee.
39. " Honey Bee.
40. Trachea, Potato Bug, showing hairs.
41. " Water Beetle.
42. Wing, Bee, showing hooklets.
43. " Blow Fly.
44. " Butterfly.
45. " Honey Bee.
46. " Mosquito

SERIES ILLUSTRATING VEGETABLE STRUCTURE.

No. **9060.** Each, **60** cents.

THE CELL AND ITS PRODUCTS.

1. Protoplasm and nucleus, stained, showing chromatin threads, long section of Pine Cone.
2. Cell-Walls. Black rust spores of wheat. (See also 4.)
3. Cell formation by budding, ferment of wine. Yeast.
4. Chlorophyll. Leaf of Moss.
5. Starch and Aleurone in cross section of Pea, Stained.
6. Crystals of Cactus fruit (aggregate), and prisms in scale of Onion bulb.

TISSUES.

7. Parenchyma (soft tissue), Sunflower Pith.
8. Collenchyma (thick, angled), cross section of stem of White Water Lily.
9. Sclerenchyma (stony tissue, long, and cross section of Hickory-nut Shell).
10. Fibrous tissue, cross and long. section of Maple, showing bast and wood (stained).
11. Laticiferous (milk), tissue, Euphorbia.
12. Sieve tissue, cross and long. section of Squash stem.

TRACHEARY.

13. Spiral ringed, etc., in longitudinal section of Impatiens sp.
14. Scalariform vessels, cross and long, section of Pteris aquilina (underground stem).
15. Pitted vessels, Nicotinna glaucer. (See also 16 and 12).
16. Tracheids in Douglas Spruce.

PRIMARY MERISTEM.

17. Growing point; long. section from tip of Corn root.

SYSTEMS OF TISSUES—EPIDERMAL.

18. Epidermis of "Liveforever" leaf; top view showing stomata and cells, also cross section showing guard cells of stomata.
19. Epidermis of Ficus elastica, showing thickened epidermal walls and stomata in cross sections. Many of these sections show fine cystoliths.
20. Hairs, various kinds on one slide.

FIBRO VASCULAR SYSTEM.

21. Bundle of corn, cross and long. section.
22. Bundle of "ground-pine," Lycopodium dendroideum.

INTERCELLULAR SPACES.

23. Star-shaped cells and spaces, cross section yellow pond lily. (See also 8).
24. Turpentine canals in leaf of Pine.

☞ The fundamental system may be studied from 1, 2, 7, 8 and others.

No. **9061.** The entire set of 24 preparations, in cabinet, - - - - **$15.00**

No. **9065,** Each, **60** cents.

CYANOPHYCEÆ.

1. Oscillaria.
2. Bacteria.

CHLOROPHYCEÆ.

3. Protococcus viridis.
4. Desmids.
5. Spirogyra sp.
6. Rhizopus nigricans.
7. Vaucheria sessilis.
8. Peronospora parasitica.

PHAEOPHYCEÆ.

9. Fucus vesiculosis (cross section).

FLORIDÆÆ.

10. Coleochaete sp.
11. Ectocarpus littorales (red sea-weed).

CHARACEÆ.

12. Chara, in fruit.

ASCOMYCETES.

13. Lichen, vertical section of fruit of Physcia stellaris.

BASIDIOMYCETES.

14. Cross section of gills of Agaricus sp. showing spores, etc.

HEPETICÆ.

15. Marchantia polymorpha.

MUSCI.

16. A moss showing leaves and fruit.

EQUISETINÆ.

17. Equisetum arvense, long. section of cone.

FILICINÆ.

18. Prothallium of Fern.
19. Sori of Fern.

LYCOPODINÆ.

20. Selaginella sp.

GYMNOSPERMÆ.

21. Pine cones, male and female, long. section.

ANGIOSPERMÆ.

22. Long. section of flower and fruit of sunflower.

No. **9066.** The entire set of 22 preparations, in cabinet, - - - - **$14.00**

No. **9071.** Both sets 9060 and 9065 in one cabinet, - - - - - **28.50**

VEGETABLE PREPARATIONS.

No. **9075.** Each, **60** cents.

1. Echinocystis lobata, transverse and longitudinal sections.
2. Acer dasycarpum, wood fibres.
3. Acorus calamus, transverse section of general peduncle and root.
4. Ricinus communis, transverse section of hypocotyledonary portion of stem.
5. Longitudinal radial section of fibro-vascular bundle of same.
6. Ranunculus repens, transverse section of root.
7. Ailanthus glanulosus, section showing cork cambium.
8. Rubus villosus } Section showing lenticels.
9. Cornus }
10. Pinus, transverse and longitudinal sections showing resin ducts.
11. Castor-bean, transverse section.
12. Begonia, petiole, transverse section.
13. Date seed, section showing sclerenchyma.
14. Pear, showing sclerenchyma.
15. Dandelion root, transverse and longitudinal sections.
16. Zamia, transverse section.
17. Arisaema triphyllum, transverse section of stem.
18. Hyacinth, transverse section of leaf.
19. Tilia americana, transverse and longitudinal sections.
20. Aristolochia sipho, transverse section.
21. Liriodendron, transverse and longitudinal sections.
22. Robinia pseudacacia, transverse section.
23. Tradescantia virginica, transverse section of leaves and stem.
24. Amaryllis, transverse section of leaf.
25. Equisetum arvense, longitudinal section of apical cells.
26. Scilla, transverse section of leaf.
27. Orange, transverse section of leaf.
28. Section of rind of orange.
29. Volvox globator.
30. Puccinia graminis, on leaf of Barberry.
31. Corn Smut.
32. Potato Mould.
33. Red Rust of Wheat.
34. Ranunculus, showing Aecidium.
35. Peziza coccinea, vertical section of fruiting surface.
36. Slime Moulds, spores and elaters.
37. Dahlia, tuber.
38. Zea mays, transverse section.

OVARIES OF:

39. Capsella bursapastoris.
40. Podophyllum.
41. Asarum.
42. Erythronium.
43. Calycanthus.
44. Vitis.
45. Trillium.
46. Dodecatheon.
47. Ranunculus.
48. Tradescantia.
49. Cucumis.
50. Sanguinaria.
51. Hibiscus.
52. Amaryllis.

CHEMICAL CRYSTALS.

No. **9080.** Each, **50** cents.

1. Alum.
2. Ammonium Chloride.
3. Ammonium Oxalate.
4. Arsenious Acid.
5. Antimony and Potassium Tartrate.
6. Copper Acetate
7. Gold (Reduced).
8. Hippuric Acid.
9. Lead Iodide.
10. Lithium Carbonate.
11. Mercuric Iodide.
12. Mercurous Iodide.
13. Morphia Sulphate.
14. Murexide.
15. Oxalic Acid.
16. Potassium Bichromate.
17. Potassium Chromate.
18. Potassium Cyanide.
19. Potassium Picrate.
20. Potassium Permanganate.
21. Potassium Platino-Chlaride.
22. Strychnia Sulphate.
23. Sulphur.
24. Tin Sulphide.

CRYSTALS SELECTED FOR THE POLARISCOPE.

No. **9085.** Each, **50** cents.

1. Ammonium Molybdate.
2. Atropia Sulphate.
3. Barium Chloride.
4. Barium Oxalate.
5. Barium Platino Chloride.
6. Boracic Acid.
7. Cadmium Sulphate.
8. Copper Sulphate.
9. Gallic Acid.
10. Gallo-Tartaric Acid.
11. Lithium Platino-Sulphate.
12. Magnesium Platino-Cyanide.
13. Oleic Acid.
14. Potassium Chlorate.
15. Potassium Ferri Cyanide.
16. Potassium Ferro Cyanide.
17. Potassium Nitrate.
18. Potassium Tartrate.
19. Quinia Kinate.
20. Quinia Sulphate.
21. Salicin.
22. Sodium Borate.
23. Sodium Platino-Chloride.
24. Tartaric Acid.

MINERAL SERIES.

No. **9090.** Each, **$1.00.**

Selected preparations constituting a small set of typical mineral slides.

Mounted on glass slips 45 x 26 mm.

1. Schrift Granite (Graphic Granite).
2. Melilite Basalt.
3. Nosite Phonolite.
4. Enstatite diabase.
5. Harzburgite.
6. Hypersthene Andesite.
7. Pitchstone.
8. Uralite Porphyrite.
9. Perlite.
10. Andalusite Schist.
11. Ottrelite Schist.
12. Cyanite granulite.
13. Cordierite Gneiss.
14. Topaz Tourmaline Rock.

We can also supply the complete "Standard Collections" as recommended by Prof. C. Klein and H. Rosenbusch, upon import orders, however, only. These comprise:

No.		Price.
9091.	1st Collection — 115 thin sections of the most important petrographical minerals, mounted on glass slips 45 x 26 mm.,	**$110.00**
9092.	2nd Collection — 314 thin sections of igneous rock, mounted on glass slips 45 x 26 mm.,	**300.00**

To institutions of learning and others entitled "to duty free importation," we can furnish the above or any other standard series at European prices, which we will quote upon request.

MISCELLANEOUS.

No. **9095.**

1. Bugula avicularia, **$ .60**
2. Embryo Oysters, in fluid, moving, **1.00**
3. Odontophore of Garden Snail, **.60**
4. Synapta anchora, **.60**
5. Sponge Section, **.60**
6. Sponge spiculæ, **.60**
7. Gorgonia spiculæ. **$ .60**
8. Foraminifera, **.60**
9. Polycistina, **.60**
10. Edible Earth from Java, **.50**
11. Sea Soundings, Atlantic Ocean, **.50**
12. " " Indian Ocean, **.50**

TEST OBJECTS.

No. **9100.**

DIATOMS, DRY STYRAX OR BALSAM.

1. Amphipleura pellucida, **$ .60**
2. Frustulia saxonica, **.60**
3. Grammatophora marina, **.60**
4. " subtilissima, **.60**
5. Navicula rhomboides, **.60**
6. Nitzschia sigmoidea, **.60**
7. Pleurosigma angulatum, **.60**
8. " acuminatum, **.60**
9. " balticum, **.60**
10. Pleurosigma elongatum, **$ .60**
11. " fasciola, **.60**
12. Surirella gemma, **.60**

MISCELLANEOUS.

13. Proboscis of Blow Fly, **.75**
14. Scales of Lipisma saccharina, **.50**
15. " Podura, **.50**
16. Hair of Dermestes, larva, **.50**
17. Pygidium of Flea, **.50**

ARRANGED DIATOMS.

No.		Price.
9105.	Group of 6–18 specimens,	**$ 1.50**
9110.	Group of 18–36 specimens,	**2.50**
9115.	Group of 36–50 specimens,	**3.75**
9120.	Group of 50–65 specimens,	**5.25**
9125.	Group of 65–80 specimens,	**6.75**
9130.	Test Plate of 20 Diatoms, arranged in line according to their value as test objects, in case with printed list, mounted in balsam or styrax, each,	**5.50**
9135.	Do., mounted dry,	**6.00**
9140.	Test Plate of 60 Diatoms, arranged in line according to their value as test objects, in case with printed list; mounted in balsam or styrax, each,	**10.00**
9145.	Do., mounted dry,	**12.00**

MICRO-PHOTOGRAPHIC OBJECTS.

Minute photographs mounted on 3 x 1 inch slides for examination with the microscope.

No. **9150.** Each, **50** cents.

1. Address to Light, by Milton.
2. A Glimpse of an English Homestead.
3. Apollo and Daphne.
4. A Portaait badly paid for.
5. Cupid and Psyche.
6. Dignity and Impudence.
7. Dr. Carpenter (W. B.)
8. Ecce Homo.
9. Fingal's Cave.
10. Genesis, Chap. I. (New Version after Darwin).
11. George Washington.
12. Gray's Elegy.
13. Group of Elephants, from Life.
14. Hamlet's Soliloquy.
15. Happy as a King.
16. Jesus bearing the Cross.
17. Laying down the Law.
18. Map of North America.
19. Morning Hymn, Milton.
20. Niagara Falls.
21. Origin of Species, made easy.
22. Panoramic Views of Paris.
23. Paul Preaching at Athens (Raphael).
24. Planet Jupiter, Belts and Moons.
25. Planet Saturn, Rings and Moons.
26. President Lincoln and ten Union Statesmen.
27. Psalm of Life, by Longfellow.
28. Pyramid of Ghizeh.
29. Rustic Felicity.
30. Sermon on the Mount.
31. Signing of the Declaration, 1776.
32. Song of the Shirt.
33. "Suffer Little Children to come unto Me."
34. Taking Down from the Cross.
35. The Bashful Lover and the Maiden Coy.
36. The Bower of Adam and Eve, Milton.
37. The Creed.
38. The Crucifixion (M. Angelo.)
39. The Death of the Stag.
40. The Gardener's Daughter.
41. The Great Rosse Telescope.
42. The Lord's Prayer.
43. The Moon.
44. The Moon, two Phases, Full and Gibbous. (75 cents.)
45. The Stag at Bay.
46. The Ten Commandments.
47. The Three Graces.
48. The Village Blacksmith, by Longfellow.
49. Venus.
50. Yarn of the Nancy Bell.
51. Windsor Castle.

EDUCATIONAL SERIES.

For the use of those who often find need for microscopic preparations, we offer the following line of objects. They are neatly mounted on the usual 3 x 1 inch slides, and securely finished with a plain ring of transparent cement. They are, however, less elaborately prepared and finished than the preceding. For teachers desiring to illustrate widely different lines of study, at small cost, they are particularly well adapted.

HISTOLOGICAL SET.

No. **9155.** Each, **30** cents.

No.

1. Blood Corpuscles, Man and Reptile.
2. Columnar Epithelum, Section of Trachea.
3. Hair Shafts and Follicles, " " Scalp.
4. Connective Tissue Corpuscles, (various localities.)
5. Elastic Fibres, from the Mesentery.
6. Transverse Section of Tendon, Ligamentum Nuchæ.
7. Adipose Tissue, from Cutus Vera.
8. Hyaline Cartilage, Child.
9. Elastic Cartilage, Ear of pig.
10. Bone (growing), transverse, Human.
11. Smooth Muscle, Human.
12. Striated muscle, long. and transverse, Human Tongue.
13. Medullated Nerve Fibres, Spinal Cord.
14. Multipolar nerve cells, (Lumbar region) Spinal Cord.
15. Stomach Section, Peptic Glands, Cat.
16. Ileum section, Peyers' Gland, Cat.
17. Liver, section across Ducts, Human.
18. Medulla Oblongata, Section, Cat.
19. Taste Bulbs, Section of Tongue of Rabbit.
20. Retina of sheep, Various layers.
21. Lung, transverse section, Human.
22. Artery and Vein, transverse section, Ox.
23. Skin of Armpit, Sebacious Glands, etc.
24. Kidney, Transverse Section.

The entire set of 24 preparations, in cabinet, - - - - - - - **$6.75**

BOTANICAL SET.

No. **9160.** Each, **30** cents.

No.

1. Single Cell, Spores of Osmunda.
2. Cell division, Algae, Spirogyra.
3. Division into 4th, Palmella.
4. Growth in all directions, Parenchyma, Stem of young Oak, pith, wood, etc.
5. Prosenchyma, longitudinal section of, Ficus Elastica.
6. Bast Tissue, longitudinal and transverse section, Abutilon.
7. Spirals and annular vessels, longitudinal section, Ricinus.
8. Dotted ducts, longitudinal radial section of White Pine.
9. Fibro-vascular bundles of Endogens, long. and trans. section Indian Corn.
10. Epidermis and stomata, Leaf of Lily.
11. Chlorophyll grains, Leaf of Moss.
12. Starch grains in situ, Root of Tapioca plant.
13. Prateine grains in situ, Seed of Ricinus, Sect'n.
14. Perennial stem, Exogen, Stem of Linden, Sect'n.
15. Vine stem, Exogen, Stem of Ampelopsis, "
16. Medullary rays, Exogen, Stem of Clematis, "
17. Annual stem, Exogen, Section of Burdock.
18. Root of Exogen, Tropical, Section of Chondrodendron.
19. Petiole of Exogen, Section of Aspen, Sphaeraphides.
20. Leaf of Exogen, Section of Ficus, Cystoliths.
21. Ovary of Exogen, Section of Tulip Tree.
22. Reed stem, Endogen, Section of Arundinaria.
23. Rhizome of Endogen, Section of Acorus.
24. Ovary of Endogen, Section of Lily.

The entire set of 24 preparations, in cabinet, - - - - - - **$6.00**

CLASSIFIED LIST OF EDUCATIONAL OBJECTS.

Each, **30** cents; per dozen, **$3.00.**

No.

9165. **Anatomical.**

Blood of Man, Dog, Cat, Ox, Frog, Fish, Snake, Fowl, etc.
Human. Sections of Finger, Eye lid, Chin, Nose, Liver, Lung, Kidney, Bone, Ear, Skin, Scalp, Spinal Cord, Brain, etc.
Bird. Sections of Brain, Spinal Cord, Trachea, Stomach, Intestine, Skin, Lung, etc.
Calf. Sections of Ear, Retina, Spinal Cord, Artery, Vein, Stomach, Kidney, Lung, etc.
Cat. Sections of Tongue, Nose, Lip, Trachea, Stomach, Duodenum, Ileum, Kidney, Lung, Liver, Pancreas, Spleen, Foot, etc.
Lizard. Sections of Stomach, and other organs in situ.
Rabbit. Sections of Brain, Medulla, Spinal Cord, Ear, Tongue, Lip, Nose, Foot, Stomach, Duodenum, Ileum, Kidney, Lung, Liver, Pancreas, etc.
Rat. Sections of Tongue, Nose, Lip, Jaw, Stomach, Duodenum, Ileum, Kidney, Lung, Pancreas, Foot, etc.
Snake. Sections of Brain, Stomach, Kidney, Intestine, etc.

9170. **Crystals.**

Actinolite, Asbestos, Amygdalin, Berberine, Bichromate of Potassa, Caffeine, Chloride of Strontium, Chrome Alum, Hippuric Acid, Limonite in muscovite, Nitro-prusside of Sodium, Oxalate of Ammonia, Picrate of Ammonia, Palminitic Acid, Sulphate of Copper, Stearic Acid, Salicin, Satin Spar, Theine, etc.

9175. **Plant Tissues.**

Epidermis with stomata of Grass, Indian corn, Aloe, Apple, Iris, Yucca, Equisetum, Deutzia, etc.
Leaves. Sections of Aloe, Ricinus, India Rubber Tree, Iris, Lily, etc.
Pollen of Mallow, Hibiscus, Althea, Coboea, Passion Flower, Pine, Morning Glory, Oenothera, etc.
Seeds, opaque, of Silene, Lychnis, Stellaria, Portulaca, Drosera, Oxalis, Gerardia, Penstemon, etc.
Spirals (dissected) of Ricinus, Lotus, etc., and scalariform ducts of Fern.
Stems. Sections of Burdock, Clematis, Maple, Mahogany, Cane, Sedge, Lily, Fern, Equisetum, etc.

9180. **Miscellaneous.**

Antennae of Butterfly, Moth, Beetle, Cricket, Bee, Cockroach, Centipede, etc.
Cornea of House fly, Meat Fly, Horse Fly, Bumble Bee, Honey Bee, Wasp, Hornet, Moth, Butterfly, Beetle, Grasshopper, Cricket, Cockroach, Dragon Fly, etc.
Feathers of Fowl, Guinea Fowl, Bobolink, Humming Bird, Parrot, Peacock, Sparrow, Canary, Blue Jay, etc.
Fibres of Cotton, Flax, Ramie, Hemp, Jute, Manilla Hemp, Pineapple, Merino Wool, Lincoln Wool, Cotswold Wool, Donski Wool, Bagdad Wool, Cashmere Goat Hair, Camel's Hair, Alpaca, Vicuna; Silk of Chinese, Italian and French Silk-worm; Silk of Cecropia, Silk-Worm, etc.
Gizzard of Field Cricket, Mole Cricket, Cockroach, Katydid, Beetle, etc.
Hairs of Cat, Dog, Mouse, Rat, Mole, Ground Mouse, Goat, Cow, Horse, Bat, Caterpillar, Dermestes, Rabbit, Squirrel, Man, etc.
Head of Small Bee, House Fly, Meat Fly, Male Mosquito, Female Mosquito, Bug, Grasshopper, etc.
Legs and feet of Spider, Honey Bee, Beetle, Cricket, House Fly, Meat Fly, Centipede, Mosquito, Gyrinus, Notonecta, etc.
Ovipositor of House Fly, Meat Fly, Cricket, Grasshopper, Katydid, etc.
Parasites. Flea of Cat, Dog and Man: Bed-Bug, Head Louse, Wood Tick, Sheep Tick; Lice of Fowl, Pigeon, Swallow, Beetle, House Fly, Grasshopper, etc.
Proboscis of Butterfly, Moth, Honey Bee, Bumble Bee, Fly, etc.
Scales (opaque) of Diamond Beetle, Wing of Moth, Silkworm Moth, Butterfly, etc.
Scales of Azure Blue Butterfly, Silkworm Moth, Various Butterflies, Dermestes, Lepisma, etc.
Scales of Trout, Shad, Eel, Perch, Sole, Pike, Herring, Shark, etc.
Spicules of Sponge, Gorgonia, etc.; Foraminifera, Polycystina, etc.
Spiracles of Blow Fly, House Fly, Silk Worm, Tobacco Worm, Honey Bee, Grasshopper, Spider, etc.
Wings of Honey Bee, Bumble Bee, Crane Fly, Mosquito, House Fly, Meat Fly, Butterfly, Moth, Lace-Wing Fly, Dragon Fly, etc.

STUDENT SERIES.

Each, **10** cents; per dozen, **$1.00.**

9185. Imported objects, on slides $2\frac{3}{8} \times \frac{3}{4}$ inch paper covered, comprising parts of Insects, Hair, Feathers, Starch, Fibres, etc.

HIGH SCHOOL MICROSCOPICAL EQUIPMENT.

For the Illustration of Physiology and Botany.

Price, complete, **$59.00.**

1. **Microscope AAB 1,** as described on pages 16 and 17.

Set first class prepared microscopical objects, as follows, in cabinet:

No.

1. **Bone,** transverse section.
2. **Bone,** longitudinal section.
3. **Cartilage.**
4. **Skin** showing sweat glands.
5. **Scalp** showing roots of hair.
6. **Muscle** striated.
7. **Muscle** unstriated.
8. **Stomach.**
9. **Small intestine.**
10. **Large intestine.**
11. **Lung.**
12. **Liver.**
13. **Kidney.**
14. **Cerebrum.**
15. **Cerbellum.**
16. **Spinal Cord.**
17. **Nerve Cells.**

No.

18. **Tooth.**
19. **Protoplasm** and **nucleus** showing chromatin threads.
20. **Cell Walls.**
21. **Cell formation** by budding.
22. **Parenchyma.**
23. **Collenchyma.**
24. **Primary meristem.**
25. **Fibrous tissue** (bast, wood, etc.)
26. **Fibro-vascular system** of endogen.
27. **Scarlariform vessels.**
28. **Pitted vessels** of pine.
29. **Plant hairs,** various kinds on one slide.
30. **Pollen** of Morning Glory.
31. **Pollen** of Pine.
32. **Seeds** of Portulaca.

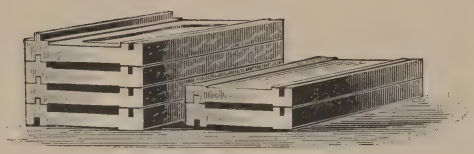
SET OF MICROSCOPICAL PREPARATIONS TO ILLUSTRATE BRIEFER HIGH SCHOOL COURSE IN PHYSIOLOGY.

Price, **$8.00.**

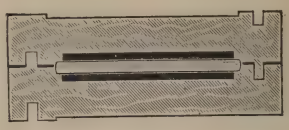
1. **Section of Tooth,** longitudinal, showing enamel, dentine and cementine.
2. **Section of Stomach** stained, showing cells and peptic glands.
3. **Section of Liver,** double stained, showing cells.
4. **Section of small intestine** of cat, transverse injected and stained, showing blood vessels in villi and epithelium coating the villi.
5. **Section of bone,** transverse, showing lacunae and canaliculi.
6. **Hyaline cartilage,** stained, showing cells.
7. **Blood** of bird or frog, double stained.
8. **Striated Muscle,** stained, showing striations and nuclei.
9. **Non-striated Muscle,** cells separated and stained.
10. **Section of Kidney** injected and stained, showing glomeruli and cells.
11. **Section of Scalp,** double stained, showing glands, hair shafts, etc.
12. **Section of Spinal Cord** of Calf, transverse stained, showing multipolar nerve cells, axis cylinder, etc.

Special prices on these sets to High Schools.

MAILING BOXES.



A B



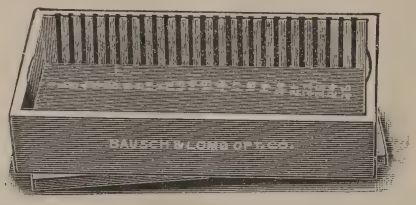
C

No. Price.

9200. **B. & L. O. Co.'s Reversible Mailing Cases,** per dozen, - - - **$.06**

DOES AWAY WITH "TOPS" AND "BOTTOMS."

The new mailing case here illustrated is formed of pieces of wood, all of which are exactly alike, hence perfectly interchangeable. As many as may be desired can be piled one upon the other, with slides between, as in A, or, if only one slide is to be mailed, two of the pieces are used in reversed position as in B. The relation of the pieces to the slide is shown in the cross section C. Only the edge of the slide is held by the wood. Slides with wide covers can be shipped safely as each piece has large depression, preventing the cover glass from being jammed.



9205. **Slide Boxes,** wood, to hold 3 objects, 3 x 1 inch, per dozen, **$ .80,** each, **$.07**

9210. **Slide Boxes,** wood, to hold 6 objects, 3 x 1 inch, per dozen, **.85,** each, **.08**

9215. **Slide Boxes,** wood, to hold 12 objects, 3 x 1 inch, per dozen, **.65,** each, **.09**

9220. **Slide Boxes,** wood, to hold 25 objects, 3 x 1 inch, per dozen, **.75,** each, **.10**

9225. **Slide Boxes,** wood, to hold 50 objects, 3 x 1 inch, per dozen, **2.00,** each, **.20**

9230. **Slide Boxes,** wood, to hold 12 objects, $1\frac{3}{4}$ x 1 inch, per dozen, **.90,** each, **.19**

9235. **Slide Boxes,** wood, to hold 25 objects, $1\frac{3}{4}$ x 1 inch, per dozen, **1.00,** each, **.10**

9240. **Slide Boxes,** wood, to hold 50 objects, $1\frac{3}{4}$ x 1 inch, per dozen, **1.50,** each, **.15**

9245. **Slide Boxes,** wood, to hold 25 objects, 3 x 2 inch, per dozen, **2.00,** each, **.20**

9250. **Cloth Covered Slide Box,** with lid and sliding cover and numbered index, to hold 25 objects, 3 x 1 inch, - - - - - - each, **.35**

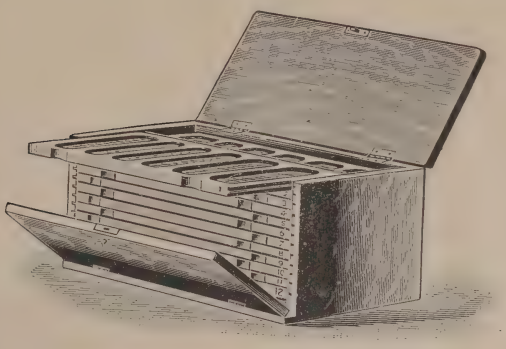
9255. **Slide Trays, map form,** holding 14 slides, per dozen, - - - - - **3.00**

9260. **Slide Trays, map form,** holding 20 slides, per dozen, - - - **3.40**

These are very serviceable and inexpensive for laboratory and private use; they can be piled to form a cabinet.

9265. **Slide Trays, map form,** in sliding case, for 12 slides, each, - - - **.60**

OBJECT AND PARAFFINE CABINETS.

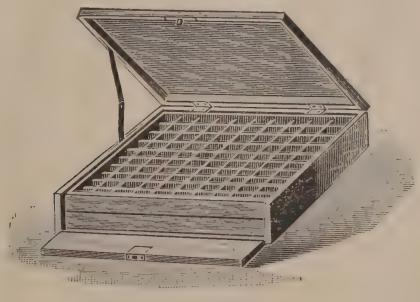


No. 9280.

No.		Price.
9270.	**Slide Cabinets,** portable, 6 single trays holding 36 objects, each,	**$1.60**
9275.	**Slide Cabinets,** portable, 9 single trays, holding 54 objects, each,	**2.25**
9280.	**Slide Cabinets,** portable, 12 single trays, holding 72 objects, each,	**2.75**
9285.	**Slide Cabinets,** portable, 12 double trays, holding 144 objects, each,	**4.00**
9290.	**Slide Cabinets,** portable, 16 double trays, holding 218 objects, each,	**6.00**

(Handle for any of above Cabinets, extra, **$ .50.**)

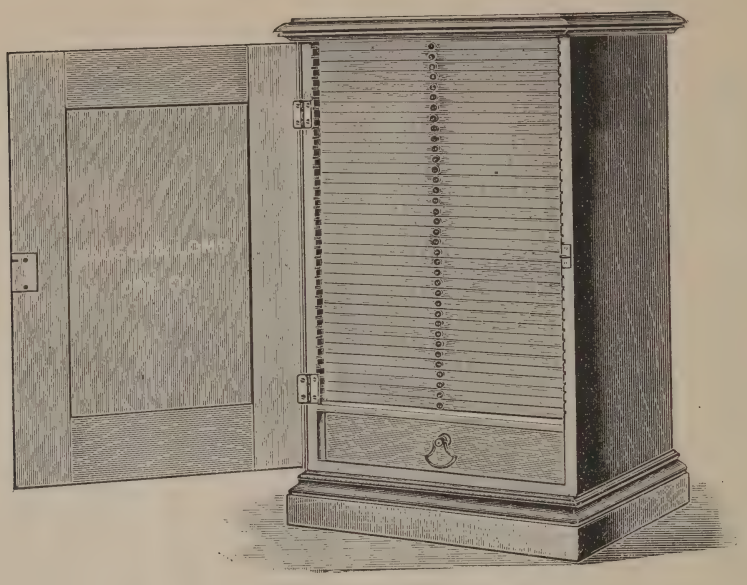
The cabinets for microscopic objects, as shown in cut, are made in our own factory, of cherry wood, highly polished and finished throughout in the best possible manner. They are much more convenient than cabinets heretofore listed, as each tray slides in separate grooves in the sides of the cabinet. This allows the removal of any tray desired without interfering with any other. These cabinets are safe for traveling and convenient for reference.



No. 9295.

9295.	**Cabinet for holding 200 Paraffine Blocks,** each,	**$4.50**
9300.	**Cabinet for holding 500 Paraffine Blocks,** each,	**7.50**

These cabinets are used for the systematic preservation of paraffine blocks containing specimens. These latter as desired can be instantly located and removed without disturbing any of the others. The outside cases are 12 x 12 x 4 and 12 x 12 x 8 inches respectively, the No. 9295 containing two trays and the No. 9300 five trays of 100 compartments each. The cabinet itself is made of cherry wood, highly finished and the trays are also of cherry. The cabinet is designed to supply the wants of those who wish to preserve specimens, imbedded in paraffine, for further use.



No. Price.

9305. **Slide Cabinet for 432 Slides,** with nickeled handle, lock and drawer, and with 36 trays each holding 12 slides, - - - - - - - **$10.00**

The above illustration exactly represents the appearance of this cabinet, which is made of cherry wood, highly polished. The work is all done in our factory under our supervision and we can therefore guarantee its excellence.

The trays for slides are made of white wood, the cavities in which the slides rest being milled out of the wood, the ends of the compartments being rounded out in such a manner that the thinnest slides may be removed with ease. To prevent warping of the tray the sides are strengthened by cherry strips rabbeted on. Each tray slides in grooves in the sides of the cabinet, thus permitting the withdrawal of any tray without disturbing any other. The trays are numbered in series from 1 to 36, the numbers being engraved on the metal knobs. Below the trays a drawer which may be utilized for labels, slide catalogue, etc., is provided.

This cabinet presents the following advantages:

The slides lie flat in the trays preventing gradual settling of objects to one side of mount.

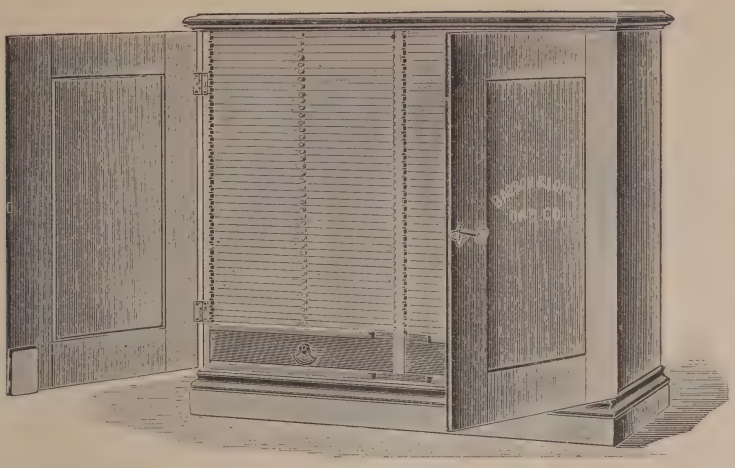
A collection of objects may be classified and kept in order for instant reference without extra trouble.

There being no paper, pasteboard or glued joints to warp, crack or get out of order the cabinet will last as long as any other piece of furniture.

The elegant finish and handsome wood makes it an ornamental as well as useful accessory.

The extremely moderate price places it within the reach of all.

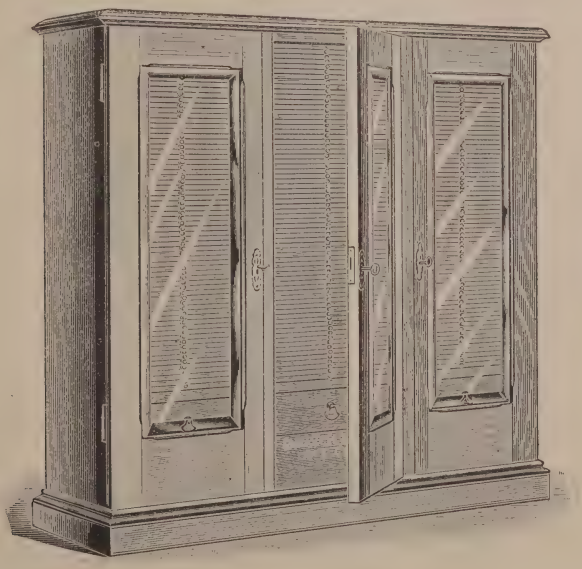
9310. **Microscope Object Register.** A neatly bound book of 36 pages of heavy paper with index for trays and for 432 slides. Each page is arranged to refer to one tray in the cabinet described above, there being 12 spaces for description of slides on each page. The book fits conveniently in the drawer of cabinet. Price, **.50**



No. Price.

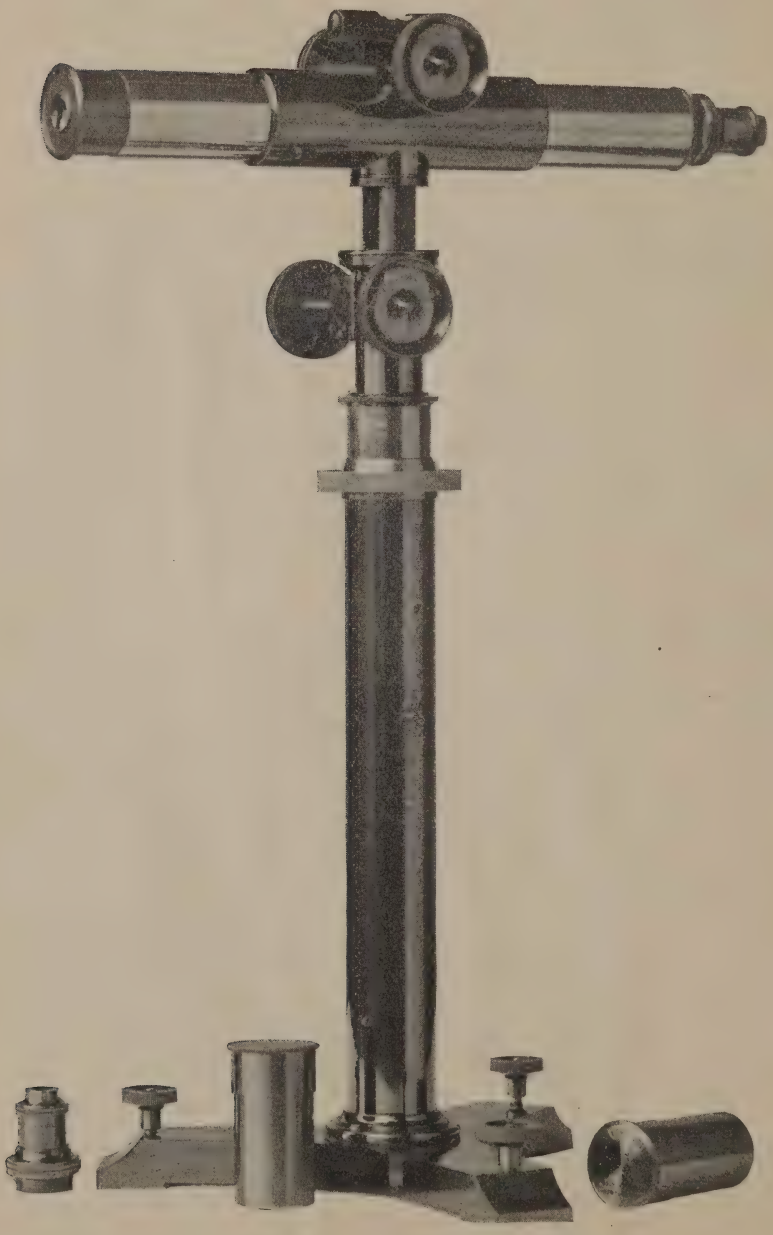
9315. **Cabinet, for 984 Slides,** complete, with two drawers for Object Register, Labels, etc., - - - - - - - - - - - - - **$20.00**

This Cabinet is like No. 9305 in construction and finish, but has two tiers of trays, each for 12 slides, or 82 trays in all. It has paneled doors with lock.



9320. **Cabinet for 2520 Slides,** complete, with 3 drawers for Object Register, Labels, etc., - - - - - - - - - - - - - **40.00**

This Cabinet is in construction similar to Nos. 9305 and 9315 but is of elegantly finished quartered oak. There are three tiers of trays each for 12 slides, or 210 trays in all, and three doors each with plate glass panel.



N—HORIZONTAL MICROSCOPE.

HORIZONTAL MICROSCOPE.

N

This microscope is constructed after the specifications of Prof. Charles R. Barnes, University of Wisconsin, Madison, Wis., and is intended for direct reading of the growth or movements of plant organs, etc. It will also be found useful in many other lines where a microscope is required in the horizontal position.

The microscope consists of a nickeled tube with society screw and of the proper diameter to receive our regular Continental Eyepieces, movable horizontally in a metal sleeve by rack and pinion. An accurate spirit level is attached to the microscope, its axis being exactly parallel with the axis of the microscope.

Vertical adjustment is quickly effected by loosening the clamping ring shown near the top of the stand, permitting the microscope tube to be raised about 200 mm. or clamped at any intermediate point. The final vertical setting of the instrument is affected by vertical rack and pinion having movement of 75 mm.

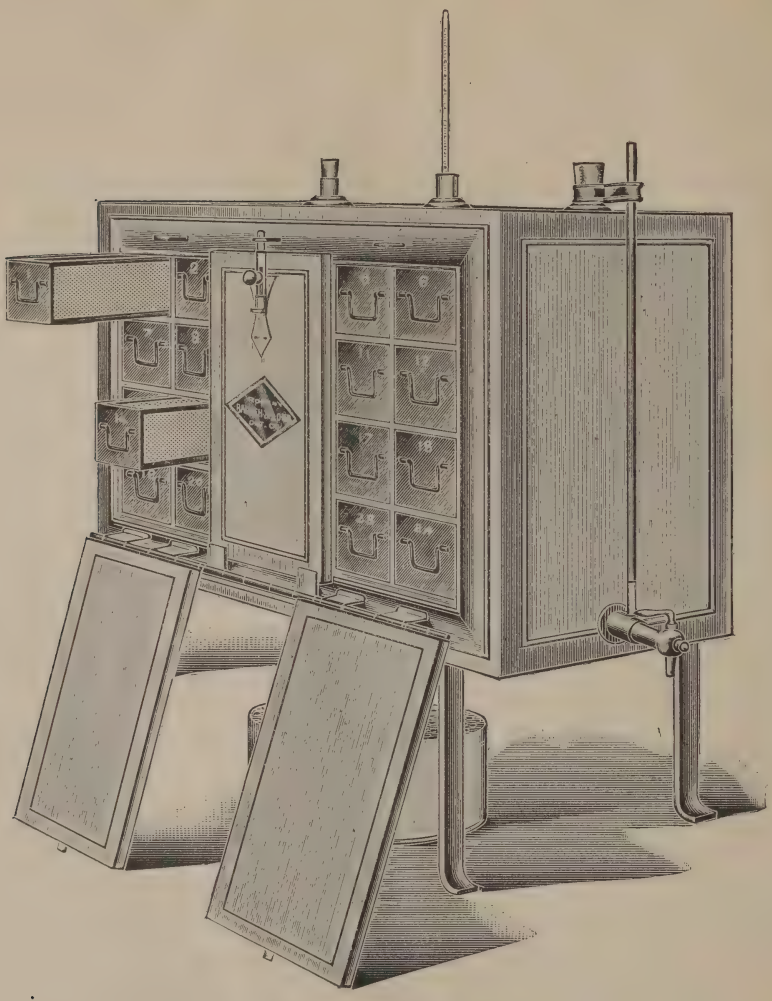
The instrument is supported on a highly finished brass tripod base. There are three leveling screws for bringing the tube to the horizontal position.

The eyepiece is of 1 inch focus and is furnished with a disc micrometer ruled to tenths of a millimeter across the entire field. Any of our Continental eyepieces may, however, be substituted, if desired.

N. 1, stand N with one micrometer eyepiece, 1 inch focus and with 3 inch objective, series I, - - - - - - - - - - - - **$34.00**

N 2, N 1 and 1 inch objective, series I, - - - - - - - - **40.00**

N 3, N 2 and 2 inch micrometer eyepiece, - - - - - - - - **44.00**



9400. **Water Bath,** Dr. Lillie's, large size, with six tiers of drawers, 24 drawers in all, **$90.00**

9405. **Water Bath,** Dr. Lillie's, medium size, with four tiers of drawers, 16 drawers in all, **75.00**

9410. **Water Bath,** Dr. Lillie's, small size, with two tiers of drawers, 8 drawers in all, **60.00**

9415. **Oil Heater** for either of above baths, - - - - - - - **7.50**

These Water Baths are constructed after specifications by Dr. Frank R. Lillie, University of Michigan. They are made up throughout of heavy copper and are coated with heavy sheet asbestos preventing loss of heat. The asbestos is enamelled with our hard white enamel finish, rendering it easily kept clean and preventing abrasions of the surface.

It is supported on a stout wrought iron frame and is throughout of very stable construction. The inside chamber is 815 mm. long, 390 mm. high, and 300 mm. deep. This space is occupied by 24 drawers of equal size numbered in series. Each drawer has copper front and bottom, the sides and back being perforated zinc, securing free circulation of warm air. The drawers are divided by perforated cross partitions, have drop handles, and run on slides, free from the lateral supports, thus permitting a sufficient circulation of the warm air to secure equal temperature in the top and bottom of the compartment.

The front of the apparatus has three asbestos covered doors, each when opened exposing two tiers of drawers.

The Oil Heater consists of a heavy copper oil reservoir containing sufficient oil to last for several days, with funnel for filling, and large burner with metal chimney. A false top with suitable perforations forms a safety air chamber above the oil reservoir and prevents heating the oil. This heater will maintain a sufficiently uniform temperature for the most delicate imbedding work.

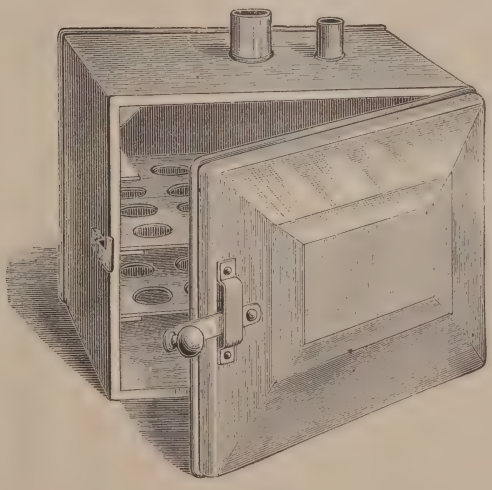
One of the large size Baths was furnished by us for the Marine Biological Laboratory, Woods Hole, Mass., regarding which we have received the following letter:

MARINE BIOLOGICAL LABORATORY,
WOODS HOLE, MASS., July 22, 1896.

Messrs. BAUSCH & LOMB OPTICAL Co.,
Rochester, N. Y.:

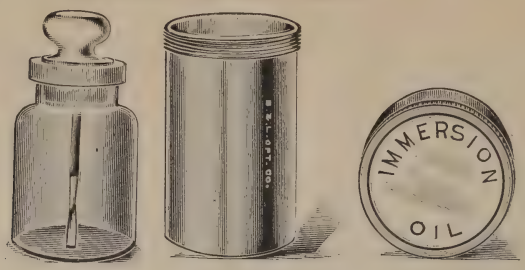
Gentlemen: The water-bath you recently made for us has now been given a fair trial, and am very pleased to say that it meets our requirements. * * * * The workmanship is excellent, beyond anything we had hoped for. Its performance under trial shows a surprisingly uniform temperature and the expansion under heat seems to have been carefully taken into consideration in the making of all movable parts. You are certainly to be congratulated for turning out so fine a piece of workmanship.

(Signed) For the Marine Biological Laboratory,
Yours sincerely,
W. H. MUNSON.



No. **9420.**

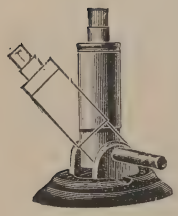
9420. Drying Oven, single wall, of heavy copper, polished and supported on iron legs. There is an extra sheet iron bottom preventing burning the copper. Outside dimensions exclusive of legs, height, 250 mm., width, 250 mm. length 300 mm. Price, - - - - - - - - - - - - **$7.50**



No. Price.

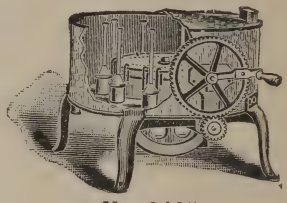
9425. **Immersion Oil Bottle,** - - - - - - - - **$ .50**

This vial for containing the oil is of proper size to fit inside a metal box of the same size as that used to contain the oil immersion objective. The neck of the vial is wide to prevent smearing with oil and is fitted with a ground glass stopper into the lower side of which a small camel's hair brush is inserted. Upon the brush the proper amount of oil is withdrawn and may be conveniently placed upon the slide or objective. This form of Oil Bottle is very convenient for traveling, as the metal cap holds the stopper of the bottle in place, absolutely preventing the escape of the oil even though the bottle be inverted.



No. 9496.

No. 9497.



No. 9435.

9430. **Babcock Milk Tester,** with 4 bottles, each, - - - - - **12.00**
9435. **Babcock Milk Tester,** with 8 bottles, - - - - - **16.00**
9440. **Babcock Milk Tester,** with 12 bottles, - - - - - - **21.00**
9445. **Milk Bottles,** each, - - - - - - - - **.25**
9450. **Cream Bottles,** each, - - - - - - - - **.30**
9455. **Greiner's Automatic Acid Pipettes,** each, - - - - - **1.00**

The Babcock Milk Tester is after the specifications of Prof. S. M. Babcock, Agricultural Experiment Station, University of Wisconsin, and is a very convenient, accurate and rapid means of determining the amount of fat in milk, etc. It may also be adapted for many other uses for which a centrifugal machine is required.

9460. **Glass Brushes,** for acids, 6 mm., each, - - - - - - **.25**
9465. **Platinum Wire,** per gram, - - - - - **At lowest market price.**
9470. **Tiles,** for dissecting, black, 150 x 150 mm., each, - - - - **.20**
9475. **Tiles,** for dissecting, white, 150 x 150 mm., each, - - - - **.40**
9480. **Tongs,** for holding rats, each, - - - - - - - **.60**
9485. **Tongs,** for holding mice, each, - - - - - - - **.60**
9490. **Glass Cutters,** diamond, each, - - - - - - - **6.00**
9495. **Canada Balsam Glasses,**

Capacity cc.,	30	60
Price, each,	**$.30**	**.40**

These glasses consist of a very wide-mouthed vial with glass cap ground on. The balsam is removed by means of a glass rod which is free in the vial.

9496. **Friedburg's Safety Burner,** with joint, may be inclined at any angle, each, **1.00**
9497. **Friedburg's Safety Burner,** low form (65 mm. high), without joint, each, **1.00**

This is a modification of the Bunsen burner, in which the air enters the burner at the top and is heated by the flame before being mixed with the gas, thus giving a hotter flame with less gas. It is warranted not to light back.

APPARATUS FOR

QUALITATIVE AND VOLUMETRIC URINARY ANALYSIS.

Price, if purchased complete, **$67.00** net, cash with order.

	Price.
1 **Microscope,** Stand BB, with 2 eyepieces and $\frac{2}{3}$ inch and $\frac{1}{6}$ inch objectives and double nosepiece,	**$55.00**
1 **Fermentation Saccharometer,** No. 3762, Dr. Einhorn, for determining the amount of sugar in the urine,	.90
1 **Fermentation Tube,** No. 3763, large size,	.25
1 **Albuminometer, Esbach's,** for determining the amount of albumen in the urine,	.75
1 **Urinometer,** Dr. Squibbs, No. 3758, 15 cm. long, graduated from 1.000 to 1.060, and with graduated cylinder to contain the urine,	.60
1 **Urea Apparatus,** Dr. Squibbs, No. 3767, for the approximate estimation of urea in the urine,	2.50
1 **Burette Stand,** No. 5165, for two burettes,	1.25
1 **Mohr's Pipette,** No. 3785, graduated in $\frac{1}{10}$ cc., capacity 25 cc.,	.35
1 **Mohr's Pipette,** No. 3785, graduated in $\frac{1}{10}$ cc., capacity 50 cc.,	.40
1 **Volume Pipette,** No. 3788, with cylindrical body and graduation, capacity 5 cc.,	.14
1 **Volume Pipette,** No. 3788, with cylindrical body and graduation, capacity 10 cc.,	.16
1 **Volume Pipette,** No. 3788, with cylindrical body and graduation, capacity 25 cc.,	.25
1 **Volume Pipette,** No. 3788, with cylindrical body and graduation, capacity 50 cc.,	.30
1 **Thermometer,** No. 3735a, with double scale etched on stem, graduated 100° C, 210° F,	1.00
1 **Cylindrical Graduate,** No. 3780, graduated to 250 cc.,	.90
1 **Sedimentation Glass,** No. 3770, graduated 100 grams,	.50
3 **Sedimentation Glasses,** No. 3771, not graduated,	.75
12 **Reagent Bottles,** glass stoppered, No. 4325, capacity, 150 cc.,	1.75
1 **Test Tube,** No. 3895, on foot, 150 mm. in length,	.12
12 **Test Tubes,** No. 3905, 150 mm. in length,	.30
1 **Test Tube Rack,** No. 4975, of wood, for 23 tubes,	.35
1 **Water Bath,** No. 3551, of polished copper, 150 mm. diam., with 5 rings, and plate perforated for test tubes,	1.25
1 **Iron Tripod,** No. 5065, for water bath,	.60
6 **Beaker Glasses,** No. 4395, capacity 120 cc.,	.96
6 **Watch Glasses,** No. 4250, beveled surface, plain,	.38
1 **Flask,** No. 3850, of Bohemian Glass, capacity 500 cc.,	.20
1 **Flask,** No. 3850, of Bohemian Glass, capacity 2000 cc.,	.45
1 **Wash Bottle,** No. 4450, with plain glass tubes, 500 cc.,	.16
1 **Glass Evaporating Dish,** No. 4425, 60 mm. diam.,	.20
1 **Glass Evaporating Dish,** No. 4325, 80 mm. diam.,	.25
2 **Glass Funnels,** No. 3995, 80 mm. diam.,	.28
100 **Round Filters,** No. 7560, superior quality, 150 mm. diam.,	.40
100 **Strips Blue Litmus Paper,** No. 7600, in vial,	.10
100 **Strips Red Litmus Paper,** No. 7605, in vial,	.10
1 **Stirring Rod,** No. 4566, 150 mm. long,	.06
1 **Spirit Lamp,** No. 3692, 5 mm. burner,	.70
6 dozen **Glass Slips,** 3 x 1 inch, white, with ground edges, No. 7315,	.43
½ ounce **Thin Glass Covers,** $\frac{3}{4}$ inch, No. 7440,	.50
100 **Glass Slip Labels,** No. 7665, square, with border,	.10
	$75.64

APPARATUS FOR A SMALL

BACTERIOLOGICAL LABORATORY.

Price, if purchased complete, **$137.50** net, cash with order.

	Price.
1 **Microscope** Stand BB, with 2 eyepieces, $\frac{2}{3}$ inch, $\frac{1}{6}$ inch and $\frac{1}{12}$ inch oil immersion, objectives and Abbe condenser in mounting with iris diaphragm and triple nosepiece,	**$95.00**
1 **Steam Sterilizer,** of copper, 8½ in. inside measurement, with legs, No. 3325,	**3.50**
1 **Bunsen Burner,** No. 3600, 150 mm. high, with flame check,	**.40**
1 **Hot Air Sterilizer,** of refined iron, 9 x 9 x 6 inches inside measurement, No. 3430,	**10.00**
1 **Bunsen Burner,** No. 3600, 150 mm. high, with flame check,	**.40**
1 **Thermometer,** with double scale etched in glass, 200° C and 400° F, No. 3735c,	**1.50**
1 **Incubator,** asbestos covered, 9 x 8 inches, inside measurement, with base, No. 3475,	**12.00**
1 **Bunsen Burner,** 100 mm. high, No. 3620,	**1.00**
1 **Thermometer,** with double scale, etched in glass, 100° C, and 212° F, No. 3735a,	**1.00**
1 **Reichert Improved Thermo-Regulator,** No. 3705,	**1.50**
5 feet **Rubber Tubing,** 6 mm., No. 5220,	**.40**
1 **Basket,** of tinned metal for test tubes, No. 3565,	**.25**
2 **Test Tube Brushes,** No. 5025,	**.20**
1 **Cylindrical Graduate,** 250 cc. capacity, No. 3780,	**.90**
1 **Conical Graduate,** 500 cc. capacity, No. 3775,	**1.00**
100 **Round Filters,** superior quality, 150 mm. diam., No. 7560,	**.40**
6 **Watch Glasses,** beveled surface, plain, not ground, No. 3750,	**.38**
12 **Glass Stoppered Flint Bottles,** 150 cc. capacity, No. 4325,	**1.25**
2 pounds **Glass Tubing,** assorted sizes, No. 4560,	**1.00**
½ dozen **Glass Stirrers,** No. 4566,	**.30**
100 **Test Tubes,** expressly made for bacteriological purposes, 150 x 15 mm., No. 3900,	**2.78**
12 **Rubber Caps** for closing same, No. 5280,	**.50**
3 **Bacteriological Flasks,** 500 cc. capacity, No. 3850,	**.60**
5 **Erlenmeyer Flasks,** 500 cc. capacity, No. 3855,	**1.25**
1 **Mouse Jar,** with woven wire cover, No. 4960,	**1.50**
2 **Platinum Needles** for inoculation, No. 4567,	**.60**
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INDEX.