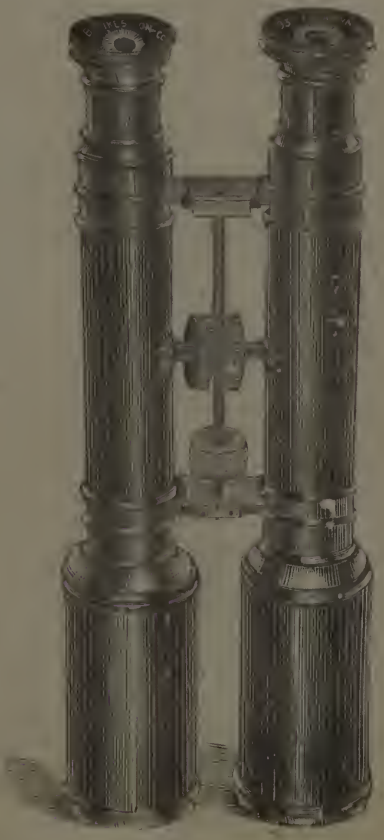
Pike's (B)

Prof. [illegible] Thomas
31st St 5th Ave

ILLUSTRATED CATALOGUE

OF

OPTICAL INSTRUMENTS,



262

MANUFACTURED, IMPORTED AND FOR SALE

BY

BENJ. PIKE'S SON & CO.,

MANUFACTURING OPTICIANS,

930 BROADWAY, NEW YORK.

ESTABLISHED 1804.

NOTICE.

Our stock of Optical and Mathematical Instruments of every variety, style, and kind, both of foreign and domestic manufacture, is undoubtedly the ***largest*** *and* ***most extensive*** *to be found in the United States.*

For this reason we are enabled to offer ***greater inducements*** *to those in search of such instruments than can be obtained elsewhere.*

In ordering goods from this Catalogue, it is only necessary to give the ***name, number,*** *and price of the article desired, and the same will be sent with the greatest dispatch.*

From the prices herein stated ***no deviation*** *will be made.*

TERMS CASH.

The terms are ***Cash*** *in current funds, which may be sent with the order, either by check, draft, post office order, or registered letter, or the goods will be sent C. O. D., provided that* ***twenty-five per cent.*** *of the amount of the bill is sent with the order, when the balance will be collected on delivery by the express company.*

All goods will be packed with the greatest care, so as to avoid breakage in transportation; but we cannot be responsible for the same after leaving our premises, except under ***special*** *contract.*

Packing boxes will be charged at their ***bare cost.***

GOODS SENT BY MAIL.

Articles of small bulk, not exceeding ***four*** *pounds in weight, can be* ***sent by mail*** *if enclosed in* ***tin packets*** *(which cost very little), at the rate of* ***one cent*** *per ounce.*

ILLUSTRATED CATALOGUE

OF

OPTICAL INSTRUMENTS,

MICROSCOPES, TELESCOPES, &c.,



SURGEON GENERAL'S OFFICE
LIBRARY
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PREFACE.

In offering our *new* Catalogue of Optical Instruments (embracing Microscopes, Telescopes, Opera, Field and Marine Glasses, etc.) to the public, it is our pleasure and privilege to state that, for the purposes intended, they are, *each and every one*, instruments of *superior excellence;* and, as representative productions of the advancement of science and knowledge in the various departments which they represent, they are *unsurpassed* by any of the *celebrated* makers of the world.

Since the establishment of our business, in 1804, science has, indeed, made great progress, and given to the world the permanent benefit and enlightenment resulting from its vast researches. In the department of *Microscopy*, its revelations have been incalculably great, and the perfection to which these instruments have been brought, and the wonderful results attending their use, render them an absolute necessity to the medical student and practitioner, and their revelations a very essential part of his education.

In the department of astronomy, requiring the use of *Astronomical Telescopes*, very important discoveries, resulting from the increased perfection, efficiency and more general use of these instruments, have been obtained, the value of which can never be too highly estimated.

As *manufacturers* of *Optical Instruments*, it has *always* been our aim to combine perfection of workmanship, together with all valuable and efficient improvements, with the *greatest moderation* in prices.

The result of producing *good* instruments at *moderate prices* has been to bring them within the reach of all, and to popularize and thus increase the demand for them to such an extent, that a better Microscope can be purchased to-day for $100 than could be had, a few years ago, for $500, the same being the case with Astronomical Telescopes and other optical instruments.

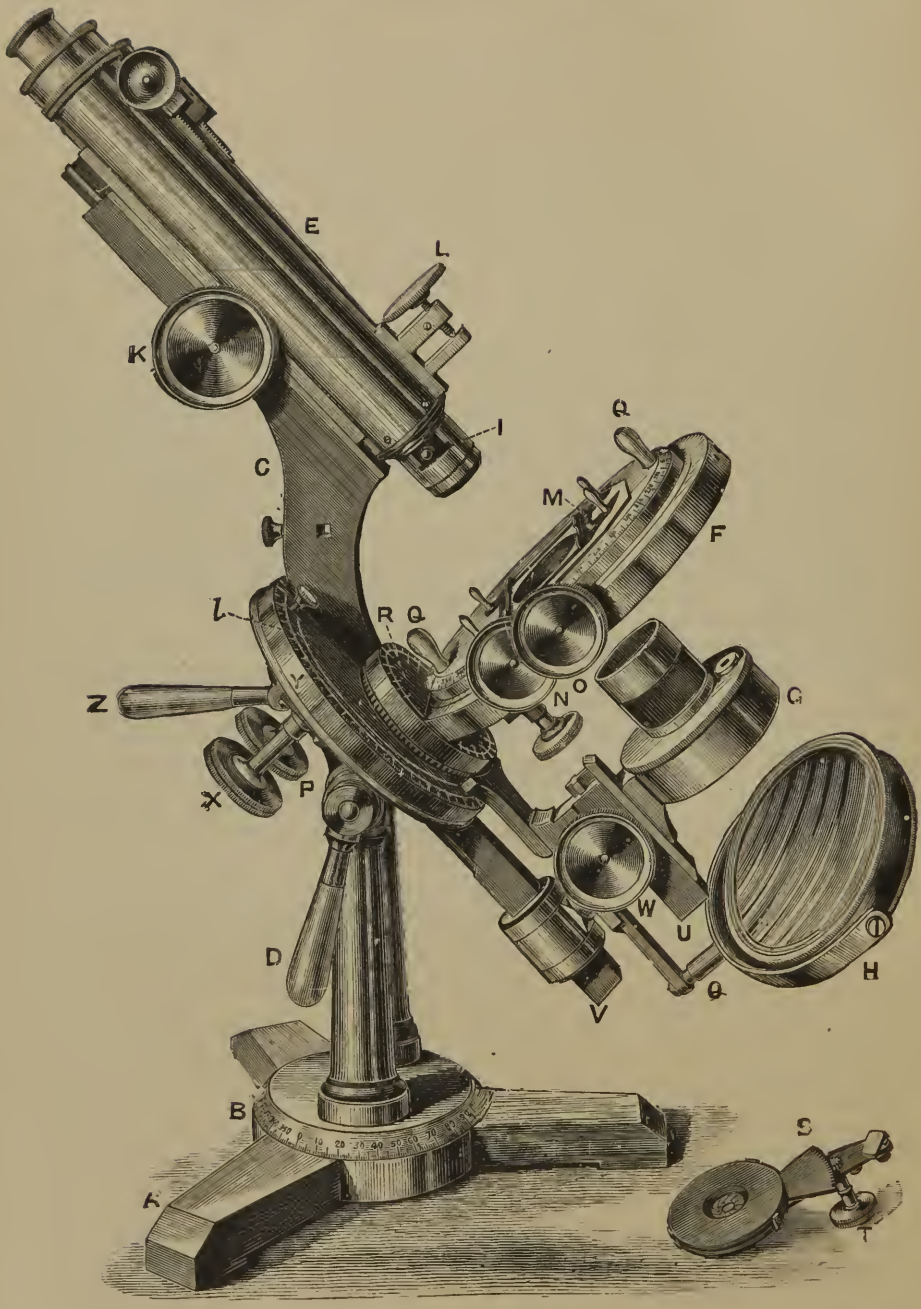
We manufacture an *Astronomical Telescope*, capable of resolving *higher tests*, for $200, than could be purchased a few years ago for over $1,000.

In Opera, Field and Marine Glasses, many improvements have taken place, from the cheapest to the most expensive, and the prices have been *very greatly reduced.*

Our *Binocular Telescopes*, or Long Range Field Glasses, are the *perfection* of instruments of this class, combining *extraordinary* power with the greatest *brilliancy* of definition, and are well worthy of examination. In every department of our business, our efforts have been to produce *first class instruments*, and the same at the most *reasonable prices*, as an examination of the following catalogue will show.

Thanking our *many* friends and patrons for their liberal patronage in the past, we would most respectfully request its continuance from themselves and others in the future, assuring them that, with our *extensive facilities* for the production and sale of Optical and Mathematical Instruments of *every description*, we are enabled to furnish the same at the *lowest possible prices.*

BENJ. PIKE'S SON & CO.



1.

THE GRAND INTERNATIONAL BINOCULAR MICROSCOPE.

THE GRAND INTERNATIONAL BINOCULAR MICROSCOPE.

The Improved Grand International Binocular Microscope has a tripod (A) for its base, upon which is placed a revolving fitting (B), graduated to degrees, by which means the microscope can be turned round without its being lifted from the table, and the amount of such rotation registered; upon this fitting two pillars are firmly fixed, and between them the limb (C) can be elevated or depressed to any angle, and tightened in its position by the lever (D). The limb carries at one end the body (E) (Binocular or Monocular), with Eye-pieces and Object-glasses; in its centre the Compound Stage (F), beneath which is the circular plate, sliding on a dove-tailed fitting, and moved up and down by the lever (Z), and carrying the supplementary body or Sub-stage (G); and at the lower end a triangular bar carrying the Mirror (H). Each of these parts requires a separate description.

The Binocular body consists of two tubes, the one fitted in the optical axis of the Microscope, and the other oblique. At their lower end, and immediately above the object-glass, there is an opening, into which a small brass box or fitting (I) slides; this box holds a prism so constructed that when slid in it intercepts half the rays from the object-glass, diverts them from their direct course, and reflects them into the additional or oblique tube. To the prism-box is attached a spring-catch, which, when pressed in, permits of the removal of the prism-box; but this is only needed for cleaning, as, when the box is drawn back to the distance allowed by this spring, the prism in no way interferes with the field of view, and all the rays pass up the direct body, and the Microscope is converted into a Monocular one.

The upper or eyepiece ends of the tubes are fitted with racks and pinion for varying the distances between the two eyepieces, to suit the differences between the eyes of various persons; and arrangements are made for racking out one tube more than the other, to suit irregularities or inequalities between the eyes of the observer.

This body is moved up and down with a quick movement by means of the milled heads (K), and with a very delicate and fine adjustment by the milled head (L). This milled head works against a lever, which moves a slide independent of the rack-movement, and gives an adjustment at once certain and decided.

The Compound Stage is of an entirely new construction; the object is most frequently merely placed upon it, but, if necessary, it can be clamped by carefully bringing down the spring-piece (M); the ledge will slide up or down, and the object may be pushed sideways; this arrangement forms the coarse adjustment. Finer movements in vertical and horizontal directions are effected by means of two milled heads (N and O), the screws attached to which are kept up to their work by opposing springs, so as to avoid all strain or loss of time. The whole stage revolves in a circular ring by the milled head (P), or this can be drawn out, and then it turns rapidly by merely applying the fingers to the two ivory studs (Q, Q) fastened on the top plate, which is divided into degrees to register the amount of revolution. The Stage is attached to the limb on a pivot, and can be rotated by any angle, which angle is recorded on the divided plate (R), or can be turned completely over, so that the object can be viewed by light of any obliquity without any interference from the thickness of the stage.

Beneath and attached to the stage is an iris diaphragm (S), which can be altogether removed, as shown in the Illustration, from its dove-tailed fitting, so as not to interfere during the rotation of the stage. The variations in the aperture of this diaphragm are made by a pinion working into a racked arc and adjusted by the milled head (T).

Beneath the stage are two triangular bars (U, V), the one revolving round and the other rigid in the optical axis of the instrument. On the former the sub-stage (G), carrying all the apparatus hereafter described for illumination and polarization, fits, and is racked up and down by the milled head (W); the mirror also, if desired, slides on the same bar; the revolving motion to this bar is given by the milled head (X), and the amount of angular movement is recorded on the circle (Y), whilst the whole of this part of the stand is raised and lowered concentric with the optical axis of the instrument by the lever (Z), and the amount of such elevation or depression registered on a scale attached to the limb. This bar can be carried round and above the stage, and be thus used for opaque illumination.

The lower triangle bar (V) carries the mirror H, or a right-angle prism, when the illumination is required to be concentric with the optical axis of the instrument, and independent of the movements of other illuminating apparatus.

The mirror-box contains two mirrors, one flat and the other concave; it swings in a rotating semicircle attached to a lengthening bar, which enables it to be turned from one side to the other, and revolves on a circular fitting for giving greater facilities in regulating the direction of the beam of light reflected, the whole sliding on either of the triangle bars, previously referred to, and made to reverse in the socket (*a*) so as to bring the centre of the mirror concentric with the axis of the Microscope in either case.

As the mirror alone is insufficient for many kinds of illumination, some provision has to be made for holding various pieces of apparatus between the object and the mirror. For this purpose a supplementary body, or sub-stage, is mounted perfectly true with the body, and is moved up and down in its fitting by rack and pinion connected with the milled heads (W). This sub-stage, to which reference has already been made, is now regarded as one of the most important parts of the Achromatic Microscope; in it all the varied appliances for modifying the character and direction of the light are fitted. But a few years since it was considered sufficient for this part of the stand to be constructed so as to move up and down perfectly coincident with the optical axis of the instrument, and for that purpose it was racked in a groove planed out on the same limb as that on the upper end of which the optical portions were carried. But lately microscopists have shown the desirability of affording every facility for lateral angular adjustments; and this has led to the sub-stage being attached to an arc (*b*) working in the circular plate (Y), and moved by a rack and pinion (X), whilst the amount of such angular movement is recorded on the upper surface of the plate (Y). Having once fixed the angular direction of the light, the focusing of it depends upon the lever (Z), which moves the circle up and down, and with it the arm carrying the illuminating apparatus, *in the optical axis of the instrument.* So long ago as 1854 Mr. Grubb, of Dublin, called attention to the advantage of mounting the illuminating apparatus on a revolving arm or arc, which he thus describes in his provisional specification for improvements in Microscopes, No. 1477, 5th July, 1854:—"My third improvement consists in the addition of a graduated sectorial arc to microscope concentric to the plane of the object '*in situ*,' on which either the aforesaid prism or other suitable illuminator is made to slide, thereby producing every kind of illumination required for microscopic examination, and also the means of registering or applying any definite angle of illumination at pleasure." With but slight modification, this is the plan adopted in this Stand.

The sub-stage is also fitted with complete centring and rotating adjustments, the latter having a graduated circle attached, and fittings for carrying Darker's Series of Selenites, Blue Glass disks for modifying the light, etc. In all the requirements of an instrument of precision, and fully meeting the wants of the most advanced modern workers, it is confidently believed that this new Stand has no rival.

PRICE $750.

No. 1. ***The Grand International Binocular Microscope, packed in a handsome Mahogany Case, and having the following accessories, all of which are of the finest quality and of the highest perfection of workmanship :***

5 Object-glasses, magnifying from 30 to 1,300 linear:—1½ in. (23°), ⅔ in. (32°), $\frac{4}{10}$ in. (55°), ⅕ in. (100°), ⅛ in. (120°).

Lieberkuhns to the ⅔ in. and $\frac{4}{10}$ in. Object-glasses.

6 Eyepieces, viz. :—1 pair A, 1 pair B, 1 pair C. Graduated Draw-Tube. Erecting-Glass for use with the ⅔ Object-Glass for erecting the Image and varying the power. Achromatic Condenser, with Revolving Diaphragm. Wenham's Parabolic Reflector. Polarizing Apparatus. One Selenite. Large Bull's-eye Condenser, on separate Stand. Smaller Side Condenser. Parabolic Illuminator. Three Dark Wells and Holder. Double Nosepiece. Wollaston's Camera Lucida. Eyepiece Micrometer. Stage Micrometer. Wenham's Compressor. Large Live-Box. Small Live-Box. Large Glass Trough. Two Glass Plates, with Ledges and Covers. Set of three Glass Fishing Tubes. Maltwood's Finder. Mineral Holder. Stage Forceps. Brass Pliers, etc.

PRICE $500.

No. 2. ***The Grand International Binocular Microscope, packed in a handsome Mahogany Case, and having the following accessories, all of which are of the finest quality and of the highest perfection of workmanship :***

3 Object-glasses, magnifying from 30 to 700 linear:—1½ in. (23°), ⅔ in. (32°), ⅕ in. (100°).

Lieberkuhn to the ⅔ Object-Glass.

6 Eyepieces, viz.: 1 pair A, 1 pair B, 1 pair C. Graduated Draw-Tube. Erecting-Glass, to be used with the ⅔ Object-Glass for erecting Image and varying the power. Achromatic Condenser. Polarizing Apparatus. One Selenite. One large Bull's-eye Condenser, on separate Stand. One small Side Condenser. Parabolic Illuminator. Three Dark Wells and Holder. Large Live-Box. Two Glass Plates, with Ledges and Covers. Stage Forceps, Brass Pliers, etc.

PRICE $400.

No. 3. ***The Grand International Binocular Microscope. Packed in a handsome Mahogany Case, and having the following accessories, all of which are of the finest quality and of the highest perfection of workmanship :***

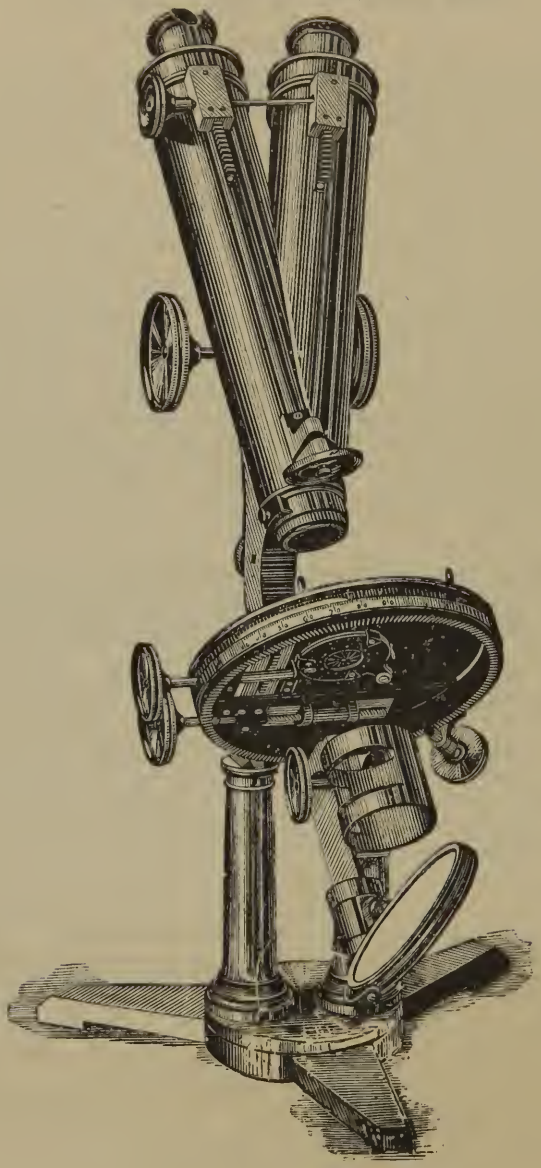
2 Object-glasses, magnifying from 60 to 400 linear:—⅔ in. (32°), ⅕ in. (100°).

4 Eyepieces, viz.: 1 pair A, 1 pair B. Graduated Draw-Tube. Large Bull's-eye Condenser, on Separate Stand. Live-Box. Polarizing Apparatus. Two Glass Plates with Ledge and Covers. Stage Forceps, Brass Pliers, etc.

PRICE $325.

No. 4. ***The Grand International Binocular Microscope Stand. Packed in a handsome Mahogany Case, with Drawers for holding accessory Apparatus. Brass handle, Lock and Key, and having***

6 Eyepieces, viz. :—1 pair A, 1 pair B, 1 pair C. Glass Plate with Ledge. Stage Forceps, Pliers, etc.



5.

No. 5. ***The Large First-Class Binocular Microscope Stand, with Concentric Rotating Stage, Iris Diaphragm, Rotating and Centering Sub-Stage.***

Two pairs of Eyepieces. Forceps, Pliers, etc. Packed in a handsomely polished Mahogany Case, ... $250

PRICE $400.

No. 6. ***The Large First-Class Binocular Microscope, with Concentric Rotating Stage, Centering and Rotating Sub-Stage and Iris Diaphragm. Packed in a handsomely polished Mahogany Case, and having the following accessories, all of which are of the finest quality, and of the highest perfection of workmanship :***

3 Object-glasses, magnifying from 30 to 700 linear:—1½ in. (23°), ⅔ in. (32°), ⅕ in. (100°.) Lieberkuhn to ⅔ Object-glass.

6 Eyepieces, viz.: 1 pair A, 1 pair B, 1 pair C. Graduated Draw-tube. Erecting-Glass for use with ⅔ Object-glass for erecting the Image and varying the power. Polarizing Apparatus. One Selenite. Large Bull's-eye Condenser on separate Stand. Parabolic Illuminator. Three Dark Wells and Holder. Large Live-Box. Two Glass Plates with Ledges and Covers. Stage Forceps, Pliers, etc.

PRICE $350.

No. 7. ***The Large First-Class Binocular Microscope, with Concentric Rotating Stage, Centering and Rotating Sub-Stage and Iris Diaphragm. Packed in a handsomely polished Mahogany Case, and having the following accessories, all of which are of the finest quality and of the highest perfection of workmanship :***

2 Object-glasses, magnifying from 60 to 720 linear:—⅔ in. (32°), ⅕ in. (100°). Lieberkuhn to ⅔ Object-glass.

6 Eyepieces, viz.: 1 pair A, 1 pair B, 1 pair C. Graduated Draw-Tube. Erecting-Glass for use with ⅔ Object-glass, for erecting Image and varying the power. Bull's-eye Condenser on separate Stand. Three Dark Wells and Holder. Polarizing Apparatus. Live-Box. Glass Plates with Ledge. Stage Forceps, Pliers, etc.

PRICE $300.

No. 8. ***The Large First-Class Binocular Microscope, with Concentric Rotating Stage, Centering and Rotating Sub-Stage and Iris Diaphragm. Packed in a handsomely polished Mahogany Case, with the following accessories :***

4 Eyepieces, viz.: 1 pair A, 1 pair B. ⅔ in. and ⅕ in. Fine Achromatic Objectives. Polarizing Apparatus. Bull's-eye Condenser, on separate Stand. Live-Box, Stage Forceps, Pliers, etc.

PRICE $300.

No. 9. ***The Large First-Class Monocular Microscope, with Concentric Rotating Stage, Centering and Rotating Sub-Stage, Iris Diaphragm, and three Eyepieces. Packed in same kind of Case, and having the same accessories as No. 7.***

PRICE $250.

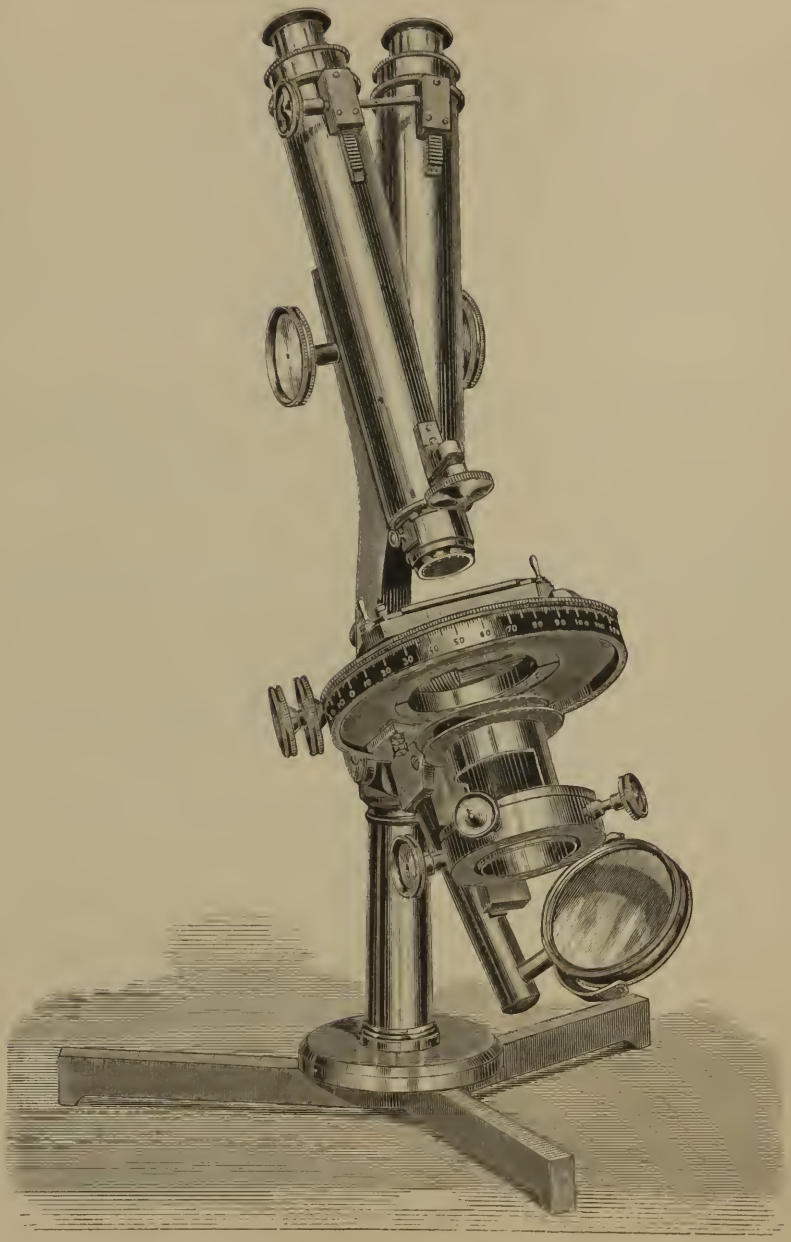
No. 10. ***The Large First-Class Monocular Microscope, with Concentric Rotating Stage, Centering and Rotating Sub-Stage, Iris Diaphragm, etc. Packed in a handsomely polished Mahogany Case, with the following accessories :***

3 Eyepieces. ⅔ in. and ⅕ in. Fine Achromatic Objectives. Polarizing Apparatus. Bull's-eye Condenser, on separate Stand. Live-Box, Stage Forceps, Pliers, etc.

PRICE $200.

No. 11. ***The Large First-Class Monocular Microscope Stand, with Concentric Rotating Stage, Centering and Rotating Sub-Stage, Iris Diaphragm. Packed in a handsome Mahogany Case.***

3 Eyepieces, Stage Forceps, Pliers, etc.



12.

No. 12. ***The First-Class Library Binocular Microscope Stand, with Concentric Rotating Stage and Centering Sub-Stage, Diaphragm.***

2 pairs of Eyepieces, Forceps, Pliers, etc. In handsome Mahogany Case.....$175

PRICE $300.

No. 13. ***The First-Class Library Binocular Microscope, with Concentric Rotating Stage and Centering Sub-Stage.***

2 Object-glasses, magnifying from 60 to 720 linear:—$\frac{2}{3}$ in. (32°), $\frac{1}{5}$ in. (100°).
Lieberkuhn to the $\frac{2}{3}$ inch Object-glass.
6 Eyepieces, viz.: 1 pair A, 1 pair B, 1 pair C. Graduated Draw-tube. Erecting-Glass, for use with the $\frac{2}{3}$ inch Object-glass, for erecting the image and varying the power. Polarizing Apparatus. Bull's-eye Condenser. Three Dark Wells and Holder. Wenham's Parabolic Illuminator. Live-Box. Two Glass Plates, with ledges and covers. Stage Forceps, Pliers, etc. Packed in a handsomely polished Mahogany Case.

PRICE $250.

No. 14. ***The First-Class Library Binocular Microscope, with Concentric Rotating Stage and Centering Sub-Stage. Packed in a handsomely polished Mahogany Case, with the following accessories:***

2 Object-glasses, magnifying from 60 to 720 linear:—$\frac{2}{3}$ in. (32°), $\frac{1}{5}$ in. (100°).
Lieberkuhn to the $\frac{2}{3}$ inch Object-Glass.
2 pairs of Eyepieces, viz.: 1 pair A, 1 pair B. Graduated Draw-tube. Bull's-eye Condenser, on stand. Live-Box. Stage Forceps. Glass Plate, with Ledge. Pliers, etc.

PRICE $200.

No. 15. ***The First-Class Library Binocular Microscope, with Concentric Rotating Stage and Centering Sub-Stage. Packed in a handsomely polished Mahogany Case, with the following accessories:***

2 pairs Eyepieces, viz.: 1 pair A, 1 pair B. $\frac{2}{3}$ inch and $\frac{1}{5}$ inch Achromatic Object-glasses of fine quality. Polarizing Apparatus. Bull's-eye Condenser, on separate Stand. Glass Plate, with ledge. Stage Forceps, Pliers, etc.

PRICE $200.

No. 16. ***The First-Class Library Monocular Microscope, with Concentric Rotating Stage and Centering Sub-Stage. Packed in a handsomely polished Mahogany Case, with the following accessories:***

3 Eyepieces: $1\frac{1}{2}$ inch, $\frac{2}{3}$ inch, and $\frac{1}{5}$ inch fine Achromatic Object-glasses. Polarizing Apparatus. Bull's-eye Condenser, on Stand. Live-Box. Glass Plate, with Ledge. Stage Forceps, Pliers, etc.

PRICE $150.

No. 17. ***The First-Class Library Monocular Microscope, with Concentric Rotating Stage and Centering Sub-Stage. Packed in a handsomely polished Mahogany Case, with the following accessories:***

3 Eyepieces: $1\frac{1}{2}$ inch, $\frac{2}{3}$ inch, and $\frac{1}{5}$ inch fine Achromatic Object-glasses. Bull's-eye Condenser, on Stand. Live-Box. Glass Plate, with Ledge. Stage Forceps, Pliers, etc.

PRICE $125.

No. 18. ***The First-Class Library Monocular Microscope Stand, with Concentric Rotating Stage and Centering Sub-Stage. Packed in a handsomely polished Mahogany Case.***

With 3 Eyepieces. Pliers, Stage Forceps, etc.

OBJECT-GLASSES FOR FIRST-CLASS MICROSCOPE STANDS.

R. & J. BECK'S FINEST OBJECT-GLASSES.

No.	Focal Length.	Linear magnifying power nearly, with Eyepieces.	A	B	C	D	E	Angle of aperture, about.	Price.
								°	
25	4 inches	Draw-tube closed	10	16	26	32	52	9	$15 00
		Ditto, if drawn out, add for each inch	1½	3	5	6	8		
26	3 inches	Draw-tube closed	12	20	40	48	74	12	27 50
		Ditto, if drawn out, add for each inch	2	4	6	7	10		
27	2 inches	Draw-tube closed	20	28	70	85	130	18	27 50
		Ditto, if drawn out, add for each inch	4	6	8	12	15		
28	1½ inches	Draw-tube closed	30	56	100	120	190	23	27 50
		Ditto, if drawn out, add for each inch	5	7	12	15	22		
29	⅔ inch	Draw-tube closed	70	120	220	270	410	32	25 00
		Ditto, if drawn out, add for each inch	8	14	25	27	48		
30	$\frac{4}{10}$ inch	Draw-tube closed	120	210	370	460	710	55	40 00
		Ditto, if drawn out, add for each inch	14	24	34	46	70		
31	$\frac{4}{10}$ inch	Draw-tube closed	146	255	460	560	890	90	60 00
		Ditto, if drawn out, add for each inch	18	32	48	60	80		
32	¼ inch	Draw-tube closed	200	340	590	720	1120	75	40 00
		Ditto, if drawn out, add for each inch	24	42	63	85	120		
33	⅛ inch	Draw-tube closed	225	400	700	860	1450	85	40 00
		Ditto, if drawn out, add for each inch	18	35	60	80	130		
34	⅛ inch	Draw-tube closed	225	400	700	860	1450	100	50 00
		Ditto, if drawn out, add for each inch	18	35	60	80	130		
35	⅛ inch	Draw-tube closed	400	680	1180	1440	2240	120	65 00
		Ditto, if drawn out, add for each inch	50	85	140	180	280		
36	$\frac{1}{10}$ inch immer.	Draw-tube closed	500	870	1500	1850	2800	160	50 00
		Ditto, if drawn out, add for each inch	60	100	180	190	370		
37	$\frac{1}{20}$ inch	Draw-tube closed	900	1570	2750	3450	4950	140	120 00
		Ditto, if drawn out, add for each inch	80	150	300	350	900		
38	$\frac{1}{20}$ inch immer.	Draw-tube closed	900	1570	2750	3450	4950	170	110 00
		Ditto, if drawn out, add for each inch	80	150	300	350	900		
39	$\frac{1}{30}$ inch	Draw-tube closed	1800	3140	5500	6900	9900	140	150 00
		Ditto, if drawn out, add for each inch	160	360	600	700	1800		

LIEBERKUHNS FOR OBJECT-GLASSES.

No.	Object-glass.	Price.	No.	Object-glass.	Price.	No.	Object-glass.	Price.
40	3-inch,	$5 75	42	1½-inch,	$5 75	44	$\frac{4}{10}$-inch,	$4 00
41	2-inch,	5 75	43	⅔-inch,	4 25	45	¼-inch,	4 00

WM. WALE'S FIRST-CLASS OBJECTIVES.

No.								Price.
50.	4	inch Objective,	Angle of	Aperture,	9°,	. . . . .	.	$15 00
51.	3	"	"	"	12°,	. . . . .	.	17 00
52.	1½	"	"	"	23°,	. . . . .	.	17 00
53.	⅔	"	"	"	32°,	. . . . .	.	18 00
54.	1/10	"	"	"	75°,	. . . . .	.	30 00
55.	1/10	"	"	"	95°,	. . . . .	.	35 00
56.	⅕	"	"	"	100°,	. . . . .	.	30 00
57.	⅕	"	"	"	135°,	. . . . .	.	35 00
58.	⅙	"	"	"	170°, immersion,	. . . .	.	40 00
59.	1/10	"	"	"	170°, "	. . . .	.	45 00
60.	1/15	"	"	"	170°, "	. . . .	.	65 00
61.	1/25	"	"	"	160°, "	. . . .	.	100 00

Oil Immersion Lenses made to order.

WM. WALE'S PROFESSIONAL OBJECTIVES.

65.	1½	inch Professional Objective,	Angle of	Aperture,	23°,	. . .	.	15 00
66.	⅔	"	"	"	30°,	. . .	.	15 00
67.	⅕	"	"	"	100°,	. . .	.	20 00
68.	1/10	"	"	"	135°,	. . .	.	25 00

WM. WALE'S ECONOMIC OBJECTIVES.

70.	3	inch Economic Objective,	Angle of	Aperture,	9°,	. . . .	.	7 00
71.	1½	"	"	"	12°,	. . . .	.	6 00
72.	¾	"	"	"	20°,	. . . .	.	6 00
73.	½	"	"	"	45°,	. . . .	.	10 00
74.	⅕	"	"	"	75°,	. . . .	.	12 00
75.	1/10	"	"	"	120°,	. . . .	.	20 00

BECK'S NATIONAL ACHROMATIC OBJECTIVES.

(*Of moderate price, but of excellent quality.*)

In order to meet the universal demand for good and well directed Object-glasses, adapted to the wants of true observers, who need reliable glasses at a moderate cost, impossible in lenses of the very highest grade, we have now introduced our ***New National Series,*** which we confidently recommend as the best low-priced Objectives ever made. They are corrected with great care, are exceedingly well mounted, furnished with the Society Screw, and packed in handsome engraved Brass Boxes. The Series is as follows:

No.	Focal length.	Lineal magnifying power nearly, with Eyepieces.				Degrees of angle of aperture.	Price.
		Draw-tubes.	A.	B.	C.		
80.	3 in.	closed	12	20	32	7°	$6 00
81.	2 in.	closed	23	43	70	10°	6 00
82.	1 in.	closed	47	78	116	19°	8 00
83.	⅔ in.	closed	65	110	170	25°	10 00
84.	½ in.	closed	100	170	260	38°	10 00
85.	¼ in.	closed	200	340	520	75°	12 00
86.	⅛ in.	closed	365	620	965	95°	20 00
87.	1/16 in.	closed	730	1240	1930	110°	30 00

FIRST-CLASS ACCESSORIES.

No.		Price.
90.	Sorby's Spectroscope Eyepiece, for the Microscope, in Mahogany Case,	$45 00
91.	Sorby's Dichroiscope,	8 00
92.	Sorby's Standard Spectrum-scale,	8 00
93.	Orthoscopic Eyepieces, giving a very large field, each,	8 00
94.	Eyepieces, each,	5 00
95.	Erecting-glasses,	$5 00 and 8 00
96.	Draw-tubes for First-Class Microscopes,	4 00
97.	Achromatic Condenser, with Revolving Diaphragm, with stops, Aperture from 25° to 80°, complete adjustments, applicable to the First-Class Stands only,	40 00
98.	Achromatic Condenser, without Diaphragm, Aperture from 20° to 60°, complete Adjustments,	20 00
99.	Brass Work of Achromatic Condenser,	8 00
100.	Right-angle Prism, for reflecting the light more perfectly than the Flat Mirror, for the First-Class Stands only,	20 00
101.	Amici's Prism, for oblique light, for the First-Class Stands only,	16 00
102.	Amici's Prism, on Separate Stand,	16 00
103.	Nachet's Prism, for oblique light,	8 00
104.	Wenham's Parabolic Reflector, for the First-Class Stands,	13 00
105.	Spot Lens, mounted in brass fitting,	4 00
106.	Equilateral Prism on Stand, for oblique illumination,	8 00
107.	Adapter on Stand, for use of Object-glass as Condenser,	4 50
108.	Brown's Iris Diaphragm,	16 00
109.	Polarizing Apparatus, with 1 Film of Selenite,	20 00
110.	Polarizing Apparatus, with extra large Polarizing Prism,	32 00
111.	Darker's Series of Selenites, adapted for the First-Class Stands only,	30 00
112.	Selenite Film, of two colors,	$1 00 and 2 00
113.	Selenite Stage, Red and Green or Blue and Orange, each,	3 00
114.	Darker's Selenite Stage, giving 13 tints,	16 00
115.	Black Glass, for Polarizing Light,	4 00
116.	Bundle of Glass, for Polarizing Light,	8 00
117.	Two Double-Image Prisms and Selenite Film, with fittings to Eyepiece, and brass plate with holes,	16 00
118.	Single Double-Image Prisms, in fitting,	7 00
119.	Crystals to show rings round the Optic Axis, each from,	4 00
120.	Tourmalines, each	5 00
121.	Beck's Patent Illuminator, in a brass box, for viewing Objects as Opaque under high powers,	4 00
122.	White-cloud Illuminator,	4 00
123.	Parabolic Illuminator, fitted to the 1½-inch and ⅔-inch Object-glasses,	8 00
124.	Parabolic Illuminator, with fittings adjusting it to any Object-glass,	10 00
125.	Parabolic Illuminator, same as No. 124, with the addition of Sorby's Reflector,	16 00
126.	Large Bull's-eye Condensing Lens, on Stand,	8 00
127.	Large Bull's-eye Condensing Lens, on Stand, with Lamp attached,	10 00
128.	Smaller Condensing Lens, with Fitting to Limb of the First-Class Stands,	7 00
129.	Smaller Condensing Lens, on Stand,	5 00
130.	Side Silver Reflector, with Fittings to Limb of the First-Class Stands,	8 00
131.	Side Silver Reflector, on Stand,	8 00

FIRST-CLASS ACCESSORIES.

No.		Price.
134.	Amplifier for increasing the power of any Objective,	$4 00
135.	Three Dark Wells and Holder,	5 00
136.	Opaque-Disk Revolver, one Tray of Disks in case,	13 00
137.	Opaque-Disk Revolver, with 3 trays of Disks, Forceps, Capsule of Gold Size, in Mahogany Case, complete,	23 00
138.	Opaque-Disk Revolver and Forceps,	8 00
139.	Boxes containing 24 Disks,	4 00
140.	Trays containing 24 Disks,	4 00
141.	Three-pronged Forceps, in German Silver, with Screw Adjustment,	6 00
142.	Three-pronged Forceps,	5 00
143.	Stage Forceps,	$2 00 and 3 00
144.	Stage Mineral-Holder,	8 00
145.	Eyepiece Micrometer, with Jackson's Adjusting Screw,	8 00
146.	Stage Micrometer, mounted in brass,	4 00
147.	Stage Micrometer, mounted in card,	2 00
148.	Maltwood's Finder in case,	3 00
149.	Indicator to each Eyepiece,	2 00
150.	Leeson's Goniometer,	20 00
151.	Wollaston's Camera Lucida, with lens to magnify Pencil Point,	8 00
152.	Neutral-tint Glass Camera Lucida,	3 00
153.	Steel-Disk Camera Lucida,	6 00
154.	Brook's Double Nosepiece, in Aluminium, curved,	23 00
155.	Brook's Double Nosepiece, curved,	11 00
156.	Quadruple Nosepiece,	27 00
157.	Quadruple Nosepiece, in Aluminium,	40 00
158.	Lever Compressorium,	7 00
159.	Parallel Compressor,	8 00
160.	Reversible Compressor,	8 00
161.	Wenham's Compressorium, for use with Wenham's Parabola,	3 00
162.	Best Live Box, with Screw Cover,	5 00
163.	Large Live Box, " "	3 00
164.	Smaller " " " " "	2 00
165.	Large Glass Trough, with Wedge and Spring complete,	3 00
166.	Smaller Glass Trough, " " " "	2 50
167.	Glass Slip, with Ledge,	40
168.	Growing Cell, for preserving objects alive in water for many days,	4 00
169.	Set of Six Live Traps and Trough, in case complete,	11 00
170.	Live Trap,	3 00
171.	Frog Plate, with Bag, etc., complete,	4 00
172.	Glass Slip, with Hollow and Ledge,	50
173.	Glass Slip, with Hollow and Ledge and Lip,	1 50
174.	Glass Tubes, Set of Three,	25
175.	Key for Tightening Joint of First Class Instruments,	1 75
176.	Opal Glass, for Moderating the Light, 3x1 inch,	40
177.	Blue Glass, for Moderating the Light, 3x1 inch,	40
178.	Astral Oil Lamp, Flat Wick and Shade, with arrangement for varying height of flame above the table,	6 00
179.	Case for Lamp, and 1 chimney,	4 00
180.	Gas Lamp, Argand Burner, Shade and six feet of flexible tubing, with arrangements for varying height of flame above the table,	12 00
181.	Fiddian's Microscope Illuminator, in case,	15 00
182.	Brass Student Lamp,	5 00

Any piece of apparatus in the foregoing list can be applied to the *first class* Stands of all makers, American or English, and the prices will be found much *lower than those of any other first-class manufacturer.*

DESCRIPTION OF THE PHYSICIAN'S BINOCULAR MICROSCOPE.

The Microscope Stand, No. 190, which is about 15 inches in height, and made entirely of brass, is finished throughout in the highest degree of workmanship, and is supported on a firm and substantial tripod base. From the centre of this base rises a stout column, to the top of which is attached, by a firm joint, the arm carrying the binocular tubes or body, by which the inclination can be varied to any degree from vertical to horizontal, the whole instrument being perfectly steady, and free from tremor in any position. The very highest powers may be used with it, as the body, being supported by the arm throughout its entire length, cannot have any unsteadiness or motion of its own.

The *coarse* adjustment of focus is effected by means of rack and pinion, with large milled heads, which works so smoothly, that there is no need to use the fine adjustment for any power lower than ¼ of an inch.

The fine adjustment is by means of a delicate micrometer screw and lever attachment, working with absolute freedom from all motion, and by which the very highest powers may be focused with the greatest exactness.

The stage is of glass, with a complete rotation in the optic axis, upon the top of which is a sliding object holder, very thin, and with a spring clip for holding the object in place during rotation.

Beneath the stage is a tube for attaching such sub-stage apparatus as the Acromatic Condenser, Wenham's Parabola, Polarizing Apparatus, etc., etc.

This is securely fastened to the stage by a bayonet catch, and can be instantly detached, leaving a very thin and unobstructed stage for Oblique Illumination.

The Shutter Diaphragm, which accompanies it, is of novel construction, with the various sized openings almost in contact with the under side of the object under examination—a great improvement upon the old revolving Disk Diaphragm. A Double Mirror Concave and Plane is hung upon a swinging bar, and arranged with every possible motion for Direct and Oblique Illumination.

As a whole, it is a complete and elegantly finished Microscope, perfect in every part, and cannot fail to give entire satisfaction in every particular, as it is undoubtedly the *choicest* and *cheapest* Binocular Microscope for the price that has ever been offered to the public.

190. ***The Physician's Binocular Microscope.*** $100 00

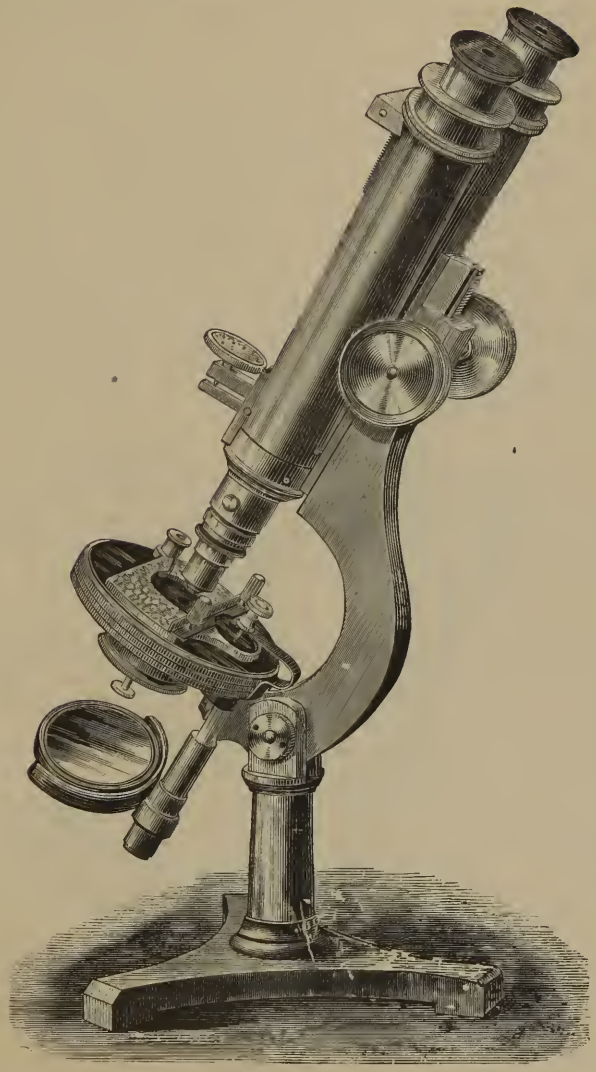
With 2 pairs of Eyepieces; 1 inch and ¼ inch *fine* Achromatic Object-glasses, magnifying from about 50 to 500 diameters; Bulls-eye Condenser on separate stand; Glass Plate, with Ledge, Stage Forceps, Pliers, etc. Packed in a handsomely polished Mahogany case, with brass handle, and drawers for accessories.

191. ***The Physician's Binocular Microscope.*** 115 00

With 2 pairs of Eyepieces; 1 inch and ¼ inch fine Achromatic Object-glasses, magnifying from about 50 to 500 diameters; Polarizing Apparatus; Live-Box; Bull's-eye Condenser on separate Stand; Glass Plate, with Ledge; Stage Forceps, Pliers, etc. Packed in a handsome Mahogany case, with drawers for accessories.

192. ***The Physician's Binocular Microscope Stand.*** 75 00

With 2 pairs of Eyepieces; Concave and Plane Mirrors; Diaphragm; Stage Forceps; Glass Plate, with Ledge, Pliers, etc., in Mahogany case, with drawers for accessories.



190.

THE PHYSICIAN'S BINOCULAR MICROSCOPE.

PRICE $100.

With 2 pairs of Eyepieces, 1 inch and ¼ inch fine Achromatic Object Glasses, magnifying from about 50 to 500 diameters. Bull's-eye Condenser on separate stand; packed in a handsomely polished mahogany case, with drawers for accessories, pliers, forceps, etc.

DESCRIPTION OF THE POPULAR BINOCULAR MICROSCOPE.

No. 195. The Stand, which is about 15 inches in height, and made entirely of brass, is finished throughout in the finest manner.

It is supported on a substantial tripod base, which renders the instrument very firm and steady, so that the highest powers may be used without the least tremor.

Rising above the base there is a solid pillar, on the top of which is a joint, by means of which the body of the instrument may be placed at any angle from vertical to horizontal.

The *coarse* adjustment is by means of a rack and pinion, accurately fitted, which gives a very smooth motion when focusing, and the finer adjustment with a micrometer screw, which moves the entire body of the instrument with the greatest delicacy and precision.

The Binocular body has attached to it an adjustment for the width of the eyes, and the Prism at the lower end can be pushed aside and the instrument used as a Monocular.

It is provided with a Glass Stage, which can be moved freely in any direction, Plane and Concave Mirrors, so arranged that the greatest obliquity of light may be obtained. Diaphragm, Stage Foreeps, etc.

PRICE $80.

THE POPULAR BINOCULAR MICROSCOPE..

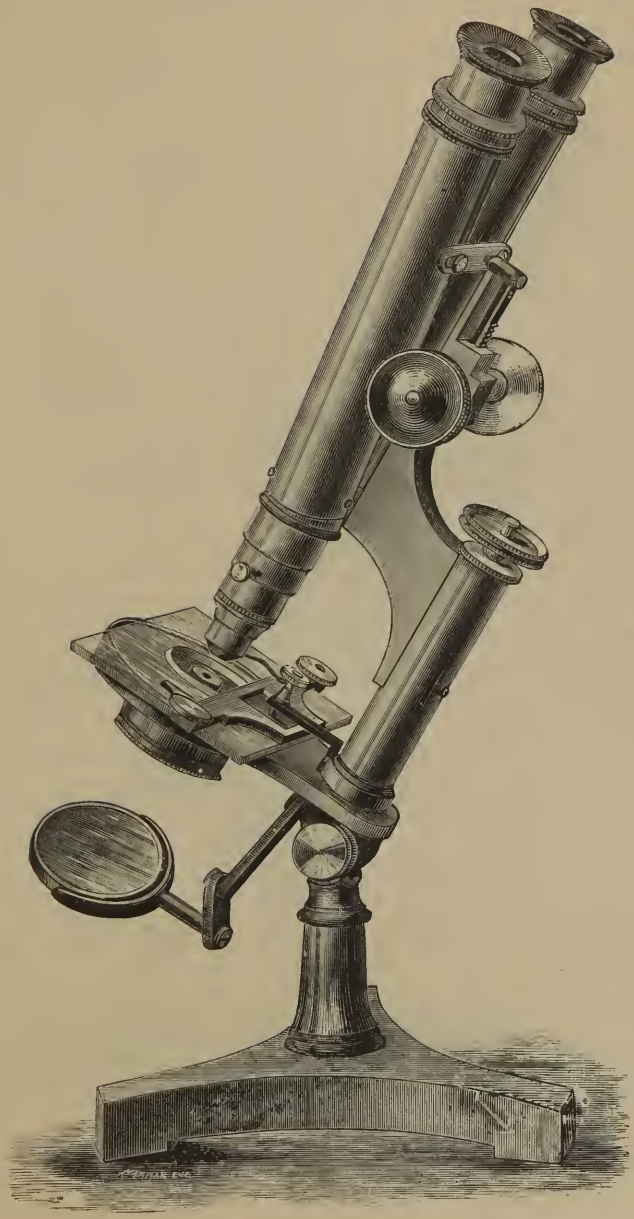
With 2 pairs of Eyepieces. 1 inch and ¼ inch fine Achromatic Object-glasses. Movable Glass Stage, Pliers, Stage Foreeps, etc. Packed in a handsome Mahogany case.

PRICE LIST OF OBJECT-GLASSES.

No.	Focal Length.	Linear Magnifying Power, nearly, with Eyepieces.				Degrees of Angle of Aperture.	Price.
		Draw-Tube,	A.	B.	C.		
196.	2 inches	Closed,	15	20	34	9°	$6 00
		Open,	26	34	57		
197.	1 inch	Closed,	48	63	105	16°	7 00
		Open,	68	93	155		
198.	½ inch	Closed,	76	100	170	36°	9 00
		Open,	110	145	240		
199.	¼ inch	Closed,	150	200	340	70°	10 00
		Open,	215	290	480		
200.	⅛ inch	Closed,	290	390	660	85°	17 50
		Open,	410	560	900		
201.	$\frac{1}{20}$ inch	Closed,	660	900	1500	100°	35 00
		Open.	925	1260	2100		

ADDITIONAL ACCESSORIES.

No.		Price.
202.	Lieberkuhn to 1 inch Object-Glass,	$3 00
203.	Dark Well,	2 00
204.	Achromatic Condenser and fitting,	8 00
205.	Wenham's Parabolic Reflector, for dark field illumination,	8 00
206.	Polarizing Apparatus, with Selenite,	13 50
207.	Wollaston's Camera Lucida, for drawing an object,	5 00
208.	Glass Micrometer, ruled into $\frac{1}{100}$ and $\frac{1}{1000}$ of an inch,	2 00
209.	Live-Box,	2 00
210.	Glass Trough, complete with wedge and spring,	2 50
211.	Eyepiece Micrometer,	2 50
212.	All of the above "Additional Apparatus"—202 to 211—when ordered together, will be furnished for	40 00



195.

THE POPULAR BINOCULAR MICROSCOPE.

PRICE $80.



215.

THE PHYSICIAN'S MICROSCOPE.

DESCRIPTION OF THE PHYSICIAN'S MICROSCOPE.

The Stand, No. 215, which is about 16 inches in height, is constructed entirely of brass, of the highest finish and finest workmanship, having a substantial tripod base, from the centre of which rises a solid pillar, to the top of which is attached, by a firm joint, the arm and body of the instrument, which can be placed at any degree of inclination from vertical to horizontal. The whole instrument being perfectly steady and free from tremor in any position, the very *highest* powers can be used with it, as the body being supported by the arm throughout its entire length, cannot have any unsteadiness or motion of its own.

The Mechanical Stage, which, by means of Rack and Pinion, with large Milled Heads, gives a delicate vertical and horizontal motion, and also a complete rotation in the Optic Axis, has upon the top a sliding object holder for holding the object in place during rotation. The Coarse Adjustment of focus is effected by means of Rack and Pinion and large Milled Heads, which work so smoothly that there is no need of using the Fine Adjustment for any power lower than $\frac{1}{4}$ of an inch. The Fine Adjustment is, by means of a delicate micrometer screw and lever attachment, working with absolute freedom from all motion, and by which the very highest power can be focused with the greatest degree of accuracy.

PRICE $100.

No.

215. ***The Physician's Microscope, with Mechanical Stage, giving a Vertical, Horizontal, and Rotary Motion.*** 3 Eyepieces; $\frac{2}{3}$ inch and $\frac{1}{6}$ inch fine Achromatic Object-glasses; Bull's-eye Condenser on separate stand; Glass Plate; Stage Forceps; Pliers; Live-Box, etc. Packed in a handsomely polished Mahogany Case, with drawers for accessories.

PRICE $80.

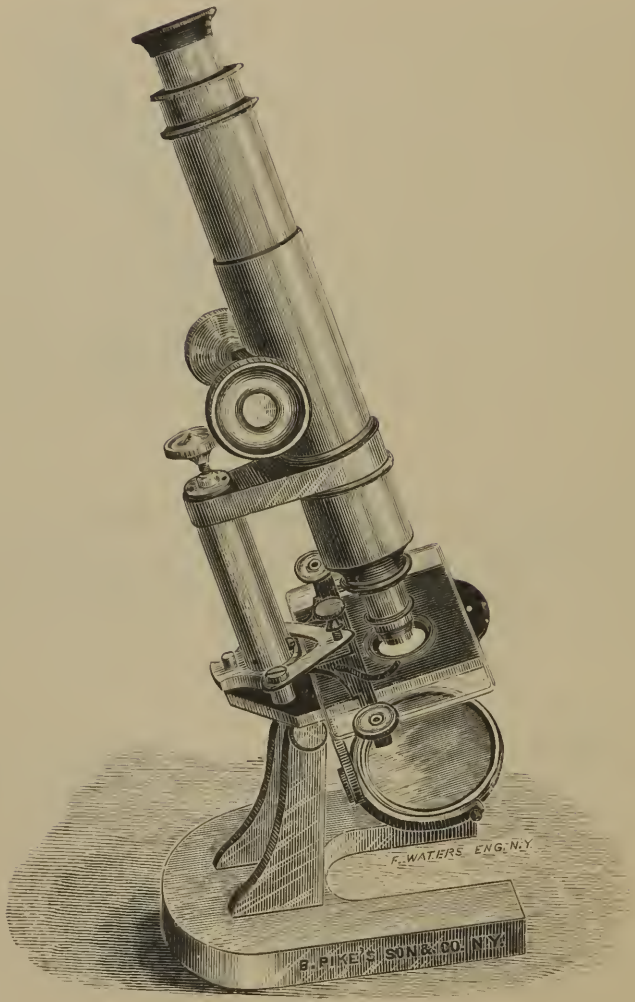
216. ***The Physician's Microscope, with Movable Glass Stage.*** 2 Eyepieces; $\frac{2}{3}$ inch and $\frac{1}{6}$ inch fine Achromatic Object-glasses; Bull's-eye Condenser on separate stand; Glass Plate; Stage Forceps; Pliers; Live-Box, etc. Packed in a handsomely polished Mahogany Case, with drawers for accessories.

PRICE $95.

217. ***The Physician's Microscope, with Movable Glass Stage.*** 2 Eyepieces; $\frac{2}{3}$ inch and $\frac{1}{6}$ inch fine Achromatic Object-glasses; Bull's-eye Condenser on separate stand; Polarizing Apparatus; Stage Forceps; Live-Box; Glass Plate; Pliers, etc. Packed in a handsomely polished Mahogany Case, with drawers for accessories.

PRICE $60.

218. ***The Physician's Microscope Stand, with Movable Glass Stage.*** Packed in a handsomely polished Mahogany Case, with 2 Eyepieces, Stage Forceps, Glass Plate, Pliers, etc.



220.

THE PROFESSIONAL MICROSCOPE.

PRICE $50.

THE PROFESSIONAL MICROSCOPE.

Among the many Microscopes which we offer, few have met with the rapid sale, and high approval of Students and Scientific men, as that which we familiarly term our *Fifty Dollar Professional Microscope*, Fig. 220.

As little can be done at the present time in the line of medical or scientific research without the use of a Microscope, it is incumbent on the manufacturer of such instruments to produce a Microscope of such *excellent* optical qualities and superior workmanship, and at such a moderate price, as to meet the wants of the Student, and to be to him practically of as much value as an instrument of far greater cost.

Our *Fifty Dollar Professional Microscope* is especially adapted to meet this demand, and from careful observation we are convinced that, considering the superior workmanship ofthe instrument itself and the *excellence* of the Achromatic Objectives which are furnished with it, it stands *unequalled*. *The Professional Microscope* when in use with the draw-tube closed is 15 inches high, and firmly and substantially made of highly-finished brass.

The body of the Microscope is supported on two columns by a joint, so that it may be inclined to any angle.

The Coarse Adjustment is by means of a Rack and Pinion, accurately made and fitted, which gives a very smooth and even motion when focusing, and the fine adjustment by a Micrometer Screw, which moves the entire body of the instrument vertically with the greatest delicacy and precision, so that objectives of the highest power may be used with it.

It has a Glass Stage which can be moved horizontally in any direction; also a revolving Diaphragm, Plane and Concave Mirrors, and a 6 inch Draw-Tube.

PRICE $50.

No. 220. ***The Professional Microscope, with Iron Base,*** packed in a handsomely polished Mahogany Case, with two Eyepieces, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch fine Achromatic Objectives, magnifying from 75 to over 800 diameters, with Bull's-eye Condenser on separate stand, Forceps, etc.

PRICE $60.

No. 221. ***The Professional Microscope, with Brass Base,*** packed in a handsomely polished Mahogany Case, with two Eyepieces, $\frac{3}{4}$ inch and $\frac{1}{5}$ inch fine Achromatic Object-glasses, magnifying from 75 to over 800 diameters, Bull's-eye Condenser on separate stand, Forceps, etc.

PRICE $45.

No. 222. ***The Professional Microscope, with Iron Base,*** packed in a handsomely polished Mahogany Case with one Eyepiece, $\frac{3}{4}$ and $\frac{1}{5}$ inch, fine Achromatic Object-glasses, magnifying from 75 to over 800 diameters, Forceps, etc.

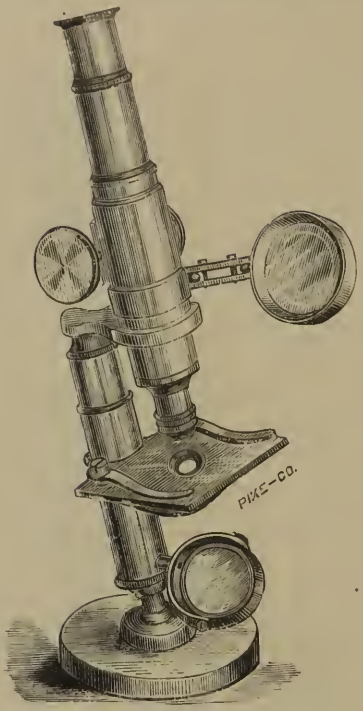
PRICE $70.

223. ***The Professional Microscope, with Iron Base,*** packed in a handsomely polished Mahogany Case, with two Eyepieces, $\frac{3}{4}$ inch, $\frac{1}{5}$ inch and $\frac{1}{10}$ inch fine Achromatic Object-glasses, magnifying from 75 to over 1500 diameters, Bull's-eye Condenser on separate stand, Forceps, Pliers, etc.

PRICE $35.

224. ***The Professional Microscope Stand, with Iron Base,*** packed in a handsome Mahogany Case, with two Eyepieces, Forceps, Pliers, etc.

THE EDUCATIONAL MICROSCOPE.



225.

No. PRICE.

225. ***The Achromatic Educational Microscope.*** $20 00

This is a thoroughly well-made instrument of highly finished Brass, and is furnished with two Eyepieces, the Lenses of which are accurately ground and centered, and which, in connection with the ¼ inch Achromatic Combination Objective which accompanies it, form a Microscope of great value for Botanical, Geological and other scientific observations.

The instrument is about 12 inches in height, heavy, firm and substantial in all its parts, so that a higher power Objective can be used with it when necessary.

The Coarse Adjustment by means of Rack and Pinion is smooth and steady in its action, and the body of the instrument can be inclined for convenience in use. Attached to the body is a Condensing Lens for use in the illumination of opaque objects, and its Magnifying Mirror can be moved in any direction.

The Achromatic Objective which belongs to it can be taken apart, and either of its three Lenses used separately or together, thus varying its power from about 50 to 300 diameters.

It is packed in a handsomely polished Walnut Case, with Brass Forceps, Glass Slips, etc.

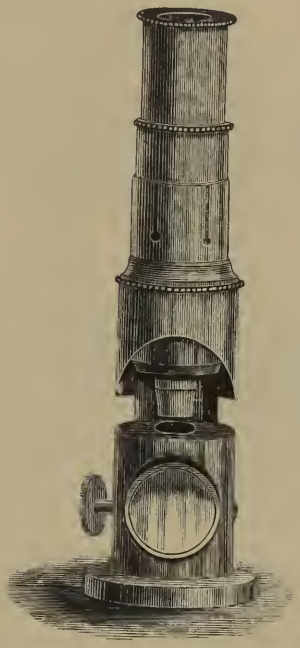
226. ***The Educational Microscope.*** $15 00

This is the same instrument as No. 225, having two Eyepieces, the same kind of Walnut box, etc., but the Objectives of which are non-achromatic. It gives, however, excellent definitions.

227. ***The Smaller Educational Microscope.*** $10 00

Is an instrument of the same character as No. 226, but of a smaller size, and magnifies about two-thirds as much. It is provided with an Eyepiece, a triple Objective, which can be taken apart and used separately; a Box, Glass Slips, etc.

THE BEGINNER'S MICROSCOPE.



230.

No.		Price.
230.	***The Beginner's Microscope.***	$2 50

This instrument, which is about six inches in height, and made of brass, well finished and highly polished, is wonderfully well adapted to give the *beginner* an endless amount of pleasure and instruction in magnifying and transforming into almost inconceivable beauty the common objects to be found in the country, such as flowers, insects, minerals, sea-weed and animalcula from the ponds, etc.

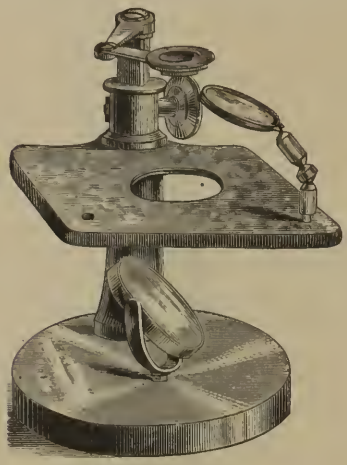
It has a magnifying power of about 40 diameters (1,600 times), and is packed in a neat Walnut Case, having a pair of Pliers, two Glass Slips, for holding an object between, one Excavated Glass Slip, for holding a drop of vinegar or stagnant water for observation, also one Prepared Object.

231.	***The Beginner's Microscope.***	$5 00

Having three Object-glasses magnifying respectively 40, 60 and 80 diameters (or 1,600, 3,600 and 6,400 times), and also a Condensing Lens for opaque objects, in Walnut Case, with Glass Slips, Pliers, Object, etc.

232.	Prepared Objects for the Beginner's Microscope, . . .	per dozen,	1 25

THE MODEL DISSECTING MICROSCOPE.



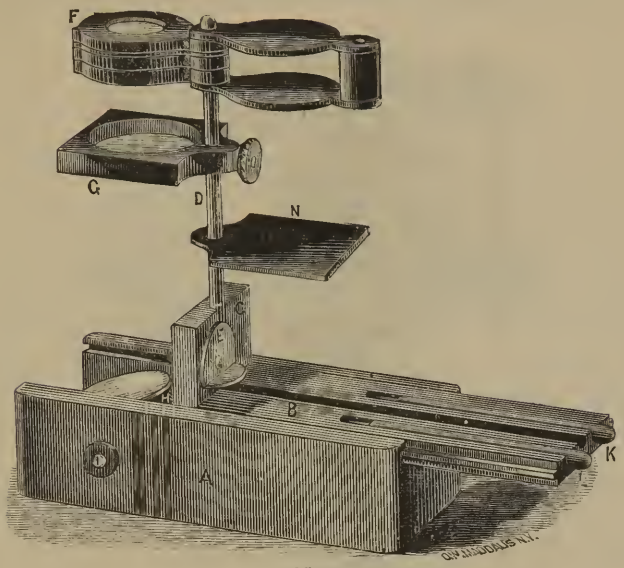
235.

No.		Price.
235.	***The Model Dissecting Microscope.*** Stand all brass, with broad circular Base and large firm Stage; Jointed Arm to carry the Lenses, with rack-and-pinion adjustment of focus; Concave Mirror and Side Condensing Lens with complete adjustments; two *single* Lenses of 1½ and 1 inch focus, a Glass Plate to fit the opening in the Stage, two Dissecting Needles and a pair of brass Forceps; the whole packed in a strong Mahogany Case with handle and lock.	$15 00
236.	***The Model Dissecting Microscope.*** Stand only with one Lens; no Case or Condenser, ... This instrument has been specially designed to meet a long-felt want for a thoroughly good dissecting Microscope, at a very moderate cost. The Stand is very firm, with a roomy Stage of the exact height from table for convenient use; the Lenses are exceedingly good, and of the most useful powers, and the whole will be found very satisfactory for most purposes.	10 00

ACCESSORIES FOR DISSECTING MICROSCOPES.

237.	Coddington Lens, 1 inch focus, ...	$6 00
238.	" " ¼ inch focus, ...	6 00
239.	" " ⅛ inch focus, ...	6 00
240.	Holder for Glass Slips, ...	2 00
241.	Two Brass Saucers with Glass Bottoms, ...	2 50
242.	Two Flat Glasses, ...	85
243.	Two Concave Glasses, ...	2 00
244.	One Piece of Box-wood covered with Cork, ...	65
245.	One Gutta-Percha Tray loaded with Lead, ...	85
246.	One Piece of Lead and Cork, ...	65
247.	One Pair of Steel Forceps, ...	1 25
248.	Two Pairs of Scissors, ...	3 50
249.	One Needle Holder, ...	2 00
250.	Two Knives, ...	2 00
251.	Two Hooks, ...	1 75
252.	Two Points, ...	1 75
253.	Wooden Tray for holding Dissecting Instruments, ...	2 75
254.	Box for containing additional Apparatus, ...	2 75

EXCELSIOR POCKET AND DISSECTING MICROSCOPE.



256.

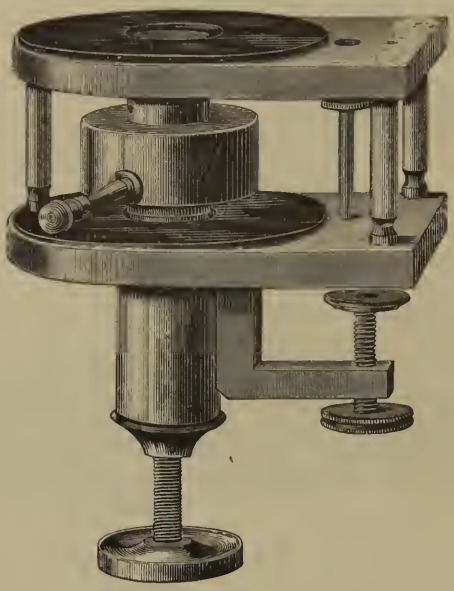
THE construction and method of using this Microscope are very simple, and will be readily understood from an inspection of the engraving. It consists primarily of a small wooden case, about one-third larger than shown in engraving. To one end of the lid of this case is attached one of the ends of the box; and when the lid is reversed and turned upside down it may be slid into the groove of the case, and then forms a stand for the lenses and glass stage, as is shown in the cut. The lenses and stage are supported by a steel rod, D, the lower end of which is hinged to the lid so that it may be turned down and lie in a groove provided for it. When raised into the position shown in the figure, it is held very securely in place by means of the button, E; and this button also serves to retain it in the groove when it is turned down. The glass stage, G, when it is fitted into a frame of hard rubber, slides easily on the stem, D, so as to be readily adjustable for focus, while at the same time it may be firmly fixed by means of a set-screw, at any desired height, and will then serve as a stage for dissecting purposes. The frame which holds the lenses fits on to the top of the stem. A mirror, H, is fitted into the case, and is readily adjustable, by means of the button shown on the outside, so that light may be reflected up through the stage when the objects to be examined are transparent, and when they are to be viewed by reflected light there is a dark ground of hard rubber, N, which is also carried by the stem, D, and may be turned under the stage, so as to cut off all transmitted light. Dissecting needles (K and L), with neat handles, fit into appropriate grooves.

As a dissecting microscope for botanical, entomological, and physiological work, this instrument is very efficient and convenient. The glass plate is fitted into the stage so as to form a cell capable of holding water, so that dissection may be carried on under that liquid, or aquatic animals may be kept alive and examined at leisure. The stage may also be turned so that the flat side will be up when so desired. When the lenses and stage are removed, they are readily packed in the case, which can be carried in the vest pocket.

The lenses may be used either singly or together; are well made, and are provided with a proper diaphragm, which secures distinctness or definition. They give a range of power of from five to thirty diameters (twenty-five to nine hundred times the surface), the first being admirably adapted to the examination of minerals, textile fabrics, the larger parts of flowers, insects, etc., while the latter is sufficiently powerful to enable the student to dissect flowers, and examine their more minute structure with great efficacy.

255. With two lenses, ... $2 50
256. With three lenses, ... 2 75
257. Set of three hard rubber slides, with openings of different kinds to serve as linen provers, ... 25

MICROTOME, OR SECTION CUTTER.

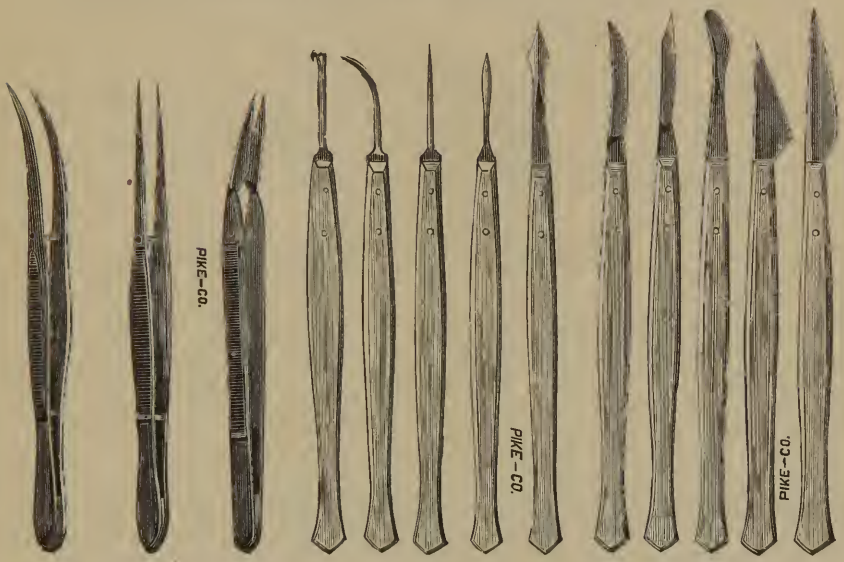


258.

No.		Price.
258.	Section Cutter (Mr. Walmsley's adaptation of Dr. Bevan Lewis's Ether Spray Microtome). Complete with Atomizer, ...	$20 00

This instrument, now largely in use by our leading Histologists, and by the Medical Department of the Army, is confidently recommended as the most complete and perfect Microtome yet produced. To the excellent Section Instrument of the Army Medical Museum pattern, No. 282, a second table, with glass top, is added, through which a brass-topped tube, with Condensing Chamber beneath, is advanced by the same Micrometer screw. Some thickened gum-water being put upon the top of this tube, a piece of tissue, say a portion of spinal column from a freshly-killed animal, may be placed in it, and the nozzle of the freezing Atomizer having been introduced into the tube beneath, the tissue will be solidly frozen in from one to three minutes. Ether may be used, but Rhigolene is much better (we can supply it, if desired); a considerable portion of it will be condensed in the chamber, and can be drawn off by the tube, shown in the illustration, for further use. The Knife should be kept cold by being placed on a block of ice before using. Full directions for use accompany each instrument. If the purchaser already has a freezing Atomizer, the Microtome may be purchased without it for $16.00. This Microtome, as well as 282, is made in two sizes, with tubes of 1 inch and 1½ inches diameter. In ordering please state which size is desired.

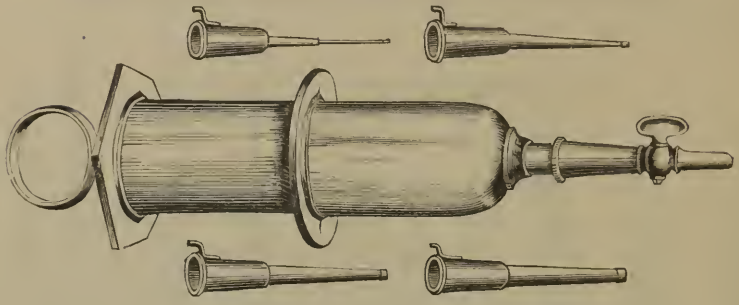
DISSECTING INSTRUMENTS AND MATERIALS FOR MOUNTING.



265–266. 264. 272–274. 275.

No.		Price.
260.	Forceps, brass, 3 inches long,	$0 25
261.	" Quekett's, for taking objects out of deep bottles,	2 50
262.	" Bull-nose,	1 00
263.	" Steel Nickel-plated, straight, 4 inches long,	1 00
264.	" " " curved, 4 "	1 00
265.	" " " " 4 " very delicate,	1 50
266.	" " " straight, 4 " " "	1 50
267.	Scissors for dissecting, straight blades, very delicate,	1 50
268.	" " blades curved on the flat,	1 50
269.	" " elbow blades,	1 50
270.	" " " " very strong,	1 25
271.	" " with spring, exceedingly delicate,	6 00
272.	Needle-holder, for Dissecting Needles,	75
273.	" for dissecting, straight point, ebony handle,	15
274.	" " " book " " "	15
275.	Knives, " " each,	75
276.	Valentine's Knife, for cutting thin sections of soft substances,	6 00
277.	Razor, with flat side, for cutting sections,	1 50
278.	Knife, for use with section cutters, in Morocco case,	3 50
279.	Knife, for use with section cutters, heavy blade, in Morocco case,	5 00
280.	Dr. Seiler's Section-Knife and Carrier, adapted to any Microtome. By use of this the largest and thinnest sections, absolutely even in thickness, may be cut,	13 00
281.	Section Cutter, Dr. Ranvier's pattern, with glass top, and binding screw, for holding wood and other hard substances,	7 50
282.	Section Cutter, Army Medical Museum pattern, with glass top, and clamp for fastening to table,	10 00
284.	Section Cutter (Rutherford's Microtome), Army Medical Museum pattern, large size, with ice-box for freezing,	15 00
285.	Section Cutter, pattern of M. Rivet, in wood, with knife,	7 50
287.	Spring Compressors, nickel-plated, per doz.,	60
288.	" " wood, per doz.,	25

INSTRUMENTS AND MATERIALS FOR MOUNTING.

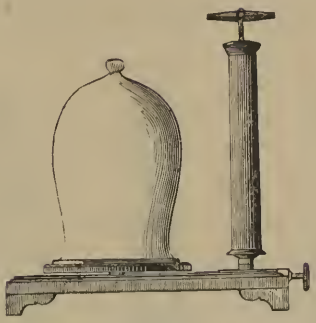


290.

No.		Price.
290.	Injecting Syringe, of brass, finest quality, ½-oz. capacity, with four pipes and stop-cock, in fine Morocco case,	$9 00
291.	Injecting Syringe, the same as 290, of 1-oz. capacity,	10 00
292.	" " " " 2-oz. "	12 00
293.	Turn-Table, with Walmsley's Centering adjustment,	4 00
294.	Turn-Table, Shadbolt's,	3 00
295.	" Sidle's "Congress," self-centering,	7 00
296.	" Cox's improved self-centering, for all Slides,	6 50
297.	" Beck's "New Volute" self-centering, for all Slides,	7 00
	This Table, of almost precisely the size and appearance of 296, is a modification of both Cox's and Bulloch's, and is confidently recommended as the most perfect yet produced.	
298.	Brass Table, with folding legs and lamp, for mounting with balsam,	2 50
299.	Brass Table and lamp, small size,	1 50

GLASS SLIPS, COVERS, ETC.

300.	Flatted Crown Glass Slips, Chance's Best, 3x1 inch, cut edges, per dozen, 15 cents, per gross,	1 50
301.	Flatted Crown Glass Slips, Chance's Best, 3x1 inch, smoothed edges, per dozen, 30 cents, per gross,	3 00
302.	Plate Glass Slips, Chance's Patent, 3x1 inch, cut edges, per dozen, 30 cents, per gross,	3 00
303.	Plate Glass Slips, Chance's Patent, 3x1 inch, smoothed edges, per dozen, 40 cents, per gross,	4 50
304.	Plate Glass Slips, Chance's Patent, 3x1 inch, extra thin, smoothed edges, per dozen, 50 cents, per gross,	5 00
305.	Wooden Slips, 3x1 inch, with hole in center, used in mounting objects between thin glass, or opaque, per dozen,	20
306.	Glass Slips, with Hollow, 3x1 inch, smooth edges, per dozen,	1 50
307.	Glass Slips, 3x1 inch, smooth edges, with cells of various sizes, shapes and depths, attached by marine glue, ready for use, per dozen,	2 50
308.	Glass Cells, of various sizes, shapes and depths, per dozen,	1 00
309.	Block-Tin Cells, of various sizes and depths, for fluid and balsam mountings, per dozen,	50
310.	Hard-Rubber Cells, of various sizes and depths, for dry and opaque mountings, per dozen,	15
311.	Thin Glass, in sheets, No. 3, $\frac{1}{50}$ to $\frac{1}{100}$ per oz.,	75
312.	" " " " No. 2, $\frac{1}{100}$ to $\frac{1}{150}$ per oz.,	1 00
313.	" " " " No. 1, $\frac{1}{150}$ to $\frac{1}{200}$, or thinner, per oz.,	1 50
314.	" " " squares, No. 3, per dozen, 18 cents, "	1 25
315.	" " " " No. 2, " 20 " "	2 25
316.	" " " " No. 1, " 25 " "	2 75
317.	" " " circles, No. 3, per dozen, 20 cents, per oz.,	2 25
318.	" " " " No. 2, " 25 " "	2 75
319.	" " " " No. 1, " 30 " "	3 75



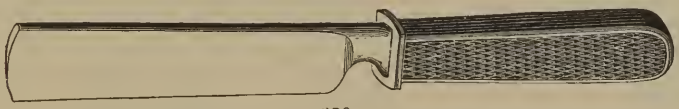
320.

No.		Price.
320.	Small Air Pump and Receiver, for use in mounting,	$10 00
321.	Holman's Life Slide, with cover, in box,	1 50
322.	Holman's Current Slide, with cover, in box,	1 50
323.	Holman's Syphon Slide. with cover, in box,	4 00



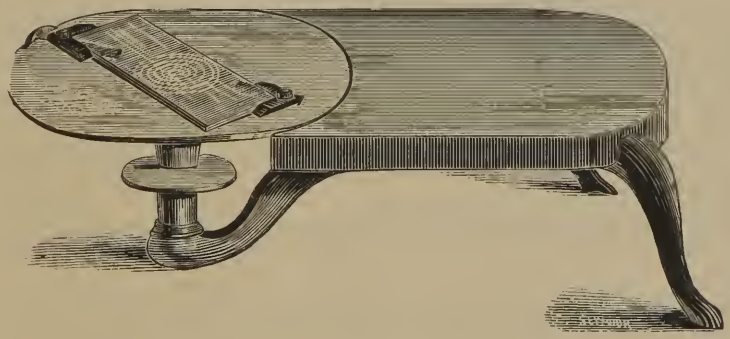
276.

276. Valentine's Double Bladed Knife, for cutting sections, ... $6 00



279.

279. Knife, for cutting sections, with extra heavy blade, in Morocco case, . . $5 00



296.

296. Improved Self-Centering Turn Table, for all slides, ... $6 50

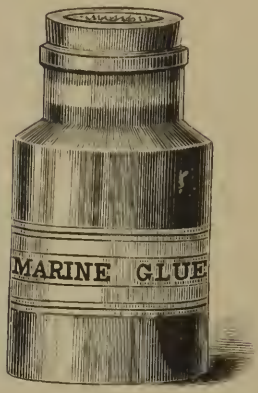
LIQUIDS AND CEMENTS FOR MOUNTING.



362.



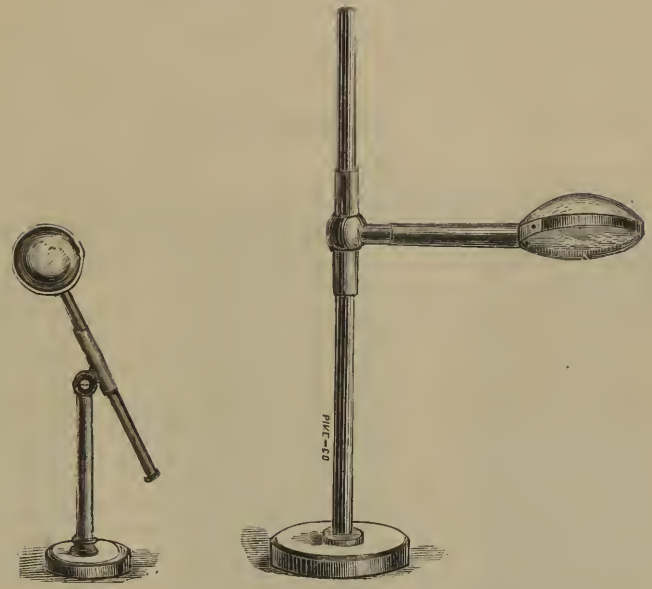
325.



339.

No.		Price.
325.	Canada Balsam, pure, in collapsible tubes,	$0 25
326.	" " " in chloroform, requires no heat, per bottle,	50
327.	" " " in benzole, " " "	50
328.	Damar, " " "	50
329.	Glycerine, pure, "	25
330.	Glycerine, Camphorated, for mounting,	25
331.	" Jelly,	50
332.	Deane's Medium,	35
333.	Farrant's Medium,	60
334.	Absolute Alcohol,	25
335.	Benzole, pure,	25
336.	Brunswick Black,	25
337.	Asphalt,	25
338.	Gold-Size,	25
339.	Marine Blue,	35
340.	Oil of Cloves,	50
341.	Bell's Cement,	50
342.	White Zinc Cement,	50
343.	Punches, various sizes, ¼ inch to 1 inch, each,	50 to 1 25
344.	Instrument for cutting circles of thin glass, in case,	10 00
345.	Glaziers' Diamonds, from,	4 00 to 8 00
346.	Writing Diamonds, each,	3 50
347.	Watch Glasses, all sizes, each 7 cents, per dozen,	75
348.	Dipping and Dropping Tubes, each,	10
349.	Pippets, with bulb,	25
350.	Ammonia Carmine, per bottle,	25
351.	Borax " "	25
352.	Carmine Red, "	25
353.	Dr. Woodward's Violet Carmine, "	25
354.	Methyl Aniline, Green, "	25
355.	Magenta " Red, "	25
356.	Blue " "	25
357.	Eosin, "	25
358.	Osmic Acid, $\frac{1}{32}$ oz., in glass capsule, "	2 50
359.	Picro Carmine, per bottle,	25
360.	Sulphindigotate of Soda (Dr. Seiler's), "	25
361.	Carmine Injecting, Gelatine (Dr. Seiler's), per oz.,	1 00
362.	Capped Bottles for containing fluids for mounting, each,	50

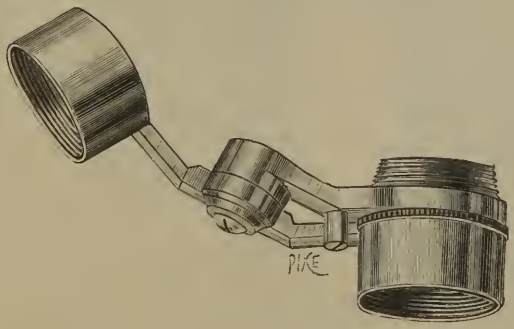
CONDENSING LENSES ON STANDS.



No. 363. 364. PRICE.

363. CONDENSING LENS (Bull's-eye), 1¾ inch diameter, on Brass stand, with joint adjustment, ... $3 50

364. CONDENSING LENS (Bull's-eye), 3 inch diameter, on high Brass stand, . . 7 00



365.

365. DOUBLE NOSEPIECE, angular, ... $6 00



345.

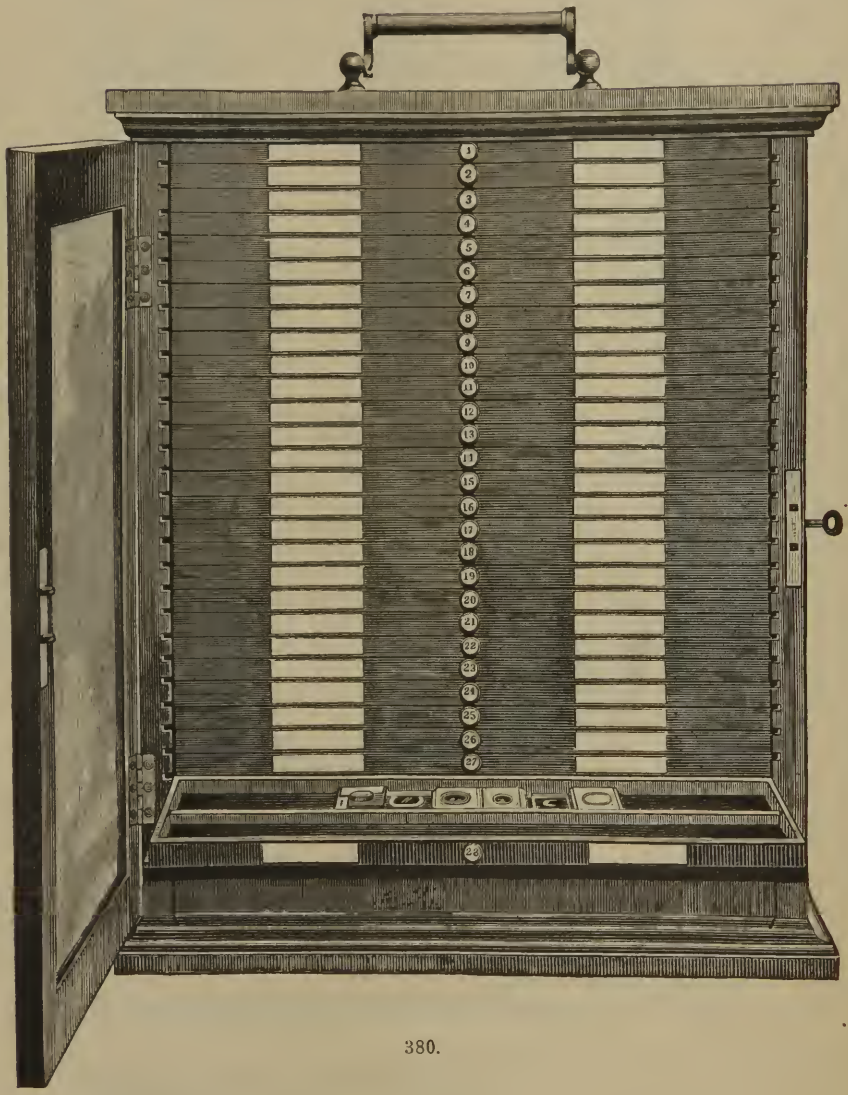


346.

345. GLAZIERS' DIAMONDS, each, from . . . . . $4 00 to $8 00

346. WRITING " " 3 50

ELEGANT CABINET FOR MICROSCOPIC OBJECTS.



380.

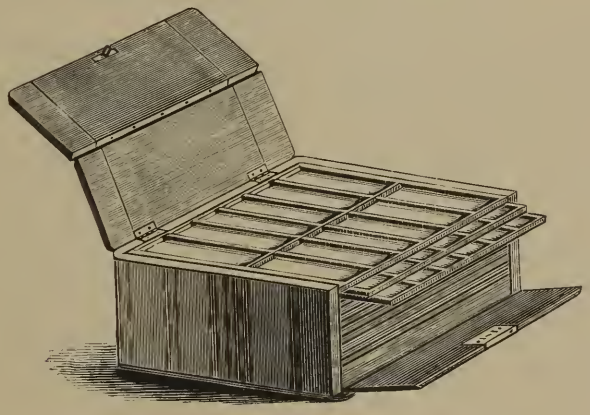
One-Fourth Actual Size.

ELEGANT CABINETS FOR MICROSCOPIC OBJECTS.

No.		Price.
380.	Mahogany Cabinet to hold 600 objects, with double glass doors and improved slide-rests, showing each object clearly when the drawers are pulled out, and allowing their easy removal,	$45 00
381.	Best Spanish Mahogany Cabinet, with glass panel and deep drawers at bottom, to hold 1000 objects,	68 00
382.	Honduras Mahogany Cabinet, without glass panel or deep drawers, to hold 1000 objects,	50 00
383.	Best Spanish Mahogany Cabinet, with glass panel, to hold 750 objects,	47 00
384.	Honduras Mahogany Cabinet, without glass panel, to hold 750 objects,	40 00
385.	Best Spanish Mahogany Cabinet, with glass panel, to hold 500 objects,	36 00
386.	Honduras Mahogany Cabinet, without glass panel, to hold 500 objects,	30 00

In the above Cabinets there are porcelain tablets let into the fronts of the drawers. The drawers are numbered and the specimens lie flat.

CASES FOR MICROSCOPIC OBJECTS.



390.

390.	Portable Horizontal Slide Cabinet, in Mahogany, with 12 Trays, to hold 12 doz. objects,	$7 50
391.	Portable Horizontal Slide Cabinet, in Mahogany, with 12 Trays, to hold 6 doz. objects,	5 00
392.	Portable Horizontal Slide Cabinet, in Mahogany, with 6 Trays, to hold 3 doz. objects,	3 00
393.	Portable Horizontal Slide Cabinet, in Poplar, with 4 Trays, to hold 2 doz. objects,	2 00
394.	Quarto Book Cabinet, for 144 objects, fitted with Elastic Bands to keep the objects in position,	10 00
395.	Card-Board Boxes, fitted with Racks, to hold 12 objects,	15
396.	Postal Boxes, to take 1 object,	6
397.	" " " 3 "	8
398.	" " " 6 "	10
399.	" " " 12 "	12
400.	" " " 25 "	15

LABELS AND COVERS FOR MICROSCOPIC OBJECTS.

401.	Adhesive Labels, Plain White, Round or Oval,	per box,		10
402.	" " Assorted Colors, Square, neatly bordered,	"	100,	25
403.	" Fronts for covering slides, handsome gold design,	"	100,	50
404.	" " for covering slides, handsome bronze design.	"	100,	30
405.	Backs for covering slides,	"	100,	10
406.	Backs or Fronts, if with holes punched, *extra*,	"	100,	15

TOURMALINE POLARISCOPE WITH CRYSTALS.



A.



410.



B.

The Tourmaline Polariscope consists of two plates of Tourmaline mounted in Cells and held opposite each other in a spring frame. By placing a crystal between, and revolving the Tourmalines in their axes, beautifully colored rings, such as Figs. A and B, are distinctly seen.

No.		Price.
410.	Tourmaline Polariscope,	$5 00
411.	" " with Crystal,	6 00

NICOL'S PRISMS.

412.	Nicol's Prism of Iceland Spar, 8 millimetres across face,	2 25
413.	" " " 9 " "	2 75
414.	" " " 10 " "	3 50
415.	" " " 11 " "	4 00
416.	" " " 12 " "	4 75
417.	" " " 14 " "	6 75
418.	" " " 16 " "	9 75
419.	" " " 20 " "	20 00



425.

425.	Solid Flint Glass Prism, 6 inches long, on stand,	2 50
426.	" " 7 " "	3 00
427.	" " 8 " "	3 50

FRENCH ACHROMATIC OBJECTIVES.

430.	Achromatic Objective, No. 0, 1-inch, doublet,	2 50
431.	" " " 1, $\frac{1}{2}$ " triplet,	3 00
432.	" " " 2, $\frac{1}{4}$ " "	3 50
433.	" " " 3, $\frac{1}{6}$ " "	4 00
434.	" " " 4, $\frac{1}{8}$ " "	5 00
435.	" " " 5, $\frac{1}{10}$ " "	7 00
436.	" " " 6, $\frac{1}{15}$ " "	10 00

A CLASSIFIED LIST

OF

FIRST-CLASS MICROSCOPIC OBJECTS,

INCLUDING THE BEST PREPARATIONS OF AMERICAN AND FOREIGN ARTISTS.

It is not intended in the limited extent of this list to enumerate even a small portion of the immense number of preparations in every department of Science with which our Cabinets are filled, but merely to call attention to the leading ones in each.

It is our aim to furnish, if possible, any slide that may be ordered, and if not in stock, we shall spare no pains to obtain it. Any number of preparations will be sent to any address (with satisfactory references) for examination, securely packed, but at the risk and cost of the party to whom sent. This is a great convenience to those residing at a distance, who cannot conveniently visit our rooms for selection.

Prices have been materially reduced from former rates, and it will always be our endeavor to furnish the most perfect preparations at the lowest rates. Our Popular and Household Series of objects are most excellent and varied in character, and remarkably cheap (in price only), since their quality is very good.

The Messrs. Cole & Son's Anatomical and Diatom preparations are uniformly the best that have thus far been produced, and they will hereafter supply us with their best work as heretofore.

Dr. Schaeffer, of Washington, and Dr. Seiler, of Philadelphia, will also supply us with their unsurpassed Histological and Pathological Specimens.

Our Double Stained Vegetable preparations (Mr. Walmsley's) are attracting marked attention at home and abroad. The following notice of the Messrs. Cole speaks for itself:

(*From the* BRITISH MEDICAL JOURNAL, *Oct.* 30, 1875.)

We have just had an opportunity of inspecting a series of microscopic slides prepared by Arthur C. Cole & Son, of Liverpool. These slides illustrated both healthy and morbid tissues, and the sections brought out well the different structures, and were chosen from good specimens. As to the mounting, it was all that could be desired, and the sections, in size and amount of surface, exceed anything we have hitherto seen. The staining is done by a process peculiar to Messrs. Cole, and is far superior to any in use elsewhere. Taken altogether, they are the most perfect and beautiful things of the kind ever offered for public sale. This is not only our own opinion, but that of some of the most expert microscopists of the day, who have testified to the excellence of these slides. For teachers wishing illustrations for their class-teaching, they will be found very acceptable, while to students commencing their histological researches, they will be invaluable, not only for their demonstrating power, but as models to be aimed at as the students themselves become experts in the art.

ANATOMICAL PREPARATIONS. By ARTHUR C. COLE & SON.

Series No. 1. 24 Pathological Preparations, from the Human Subject.

1. Lung, in Phthisis.
2. " Catarrhal Pneumonia.
3. " Croupous "
4. Liver, Amyloid, not universal in lobules.
5. " Cancer.
6. " Cirrhosis, universal in lobules.
7. " Fatty, not " "
8. " Indurated.
9. " Syphilitic, showing fibrous bands at margin.
10. Kidney, Scarlet Fever, Desquamative Nephritis.
11. " advanced Bright's disease; tubes and vessels much distended.
12. " Fatty degeneration.
13. Kidney, Cirrhosis, showing intertubular fibroid growth.
14. Kidney, Contracted constitutional Syphilis.
15. Spleen, Amyloid (or Sago).
16. Stomach, Cancer.
17. Hypertrophied Lymphatic Gland from Neck.
18. Schirrus Mammæ, round Cells elongating into Spindle Cells.
19. Uterus, Fibroid Tumor, showing Spindle Cells.
20. Epithelioma of Lip.
21. " " Hand.
22. " " Vulva.
23. Malignant Tumor from Neck.
24. Vascular Tumor of Perinæum,

In case with trays. Objects lie flat, ... $16 00

Series No. 2. 24 Physiological Preparations.

1. Man, Tongue, Transverse Section.
2. " Ileum, " "
3. " Kidney, injected from Artery only.
4. " Kidney, from Artery and Vein.
5. " Skin, Vertical Section.
6. " Brain, Cerebellum.
7. " " Cerebrum.
8. " Stomach.
9. " Pancreas.
10. " Placenta.
11. " Cuticle, showing hair follicles.
12. " Thyroid Gland.
13. Cat, Ileum, Transverse Section.
14. " Lung.
15. " Brain, Cerebrum.
16. " Tongue, Transverse Section.
17. " Liver, two colors.
18. " Bladder, Transverse Section.
19. Dog, Stomach of Puppy.
20. Pig, Parotid Gland.
21. Rabbit, Colon, mucous membrane.
22. " Ileum, mucous membrane.
23. " Kidney, from Artery and Vein.
24. " Tongue, Transverse Section.

In case with trays. Objects lie flat, ... $16 00

Series No. 3. 24 Educational Preparations.

1. Adipose tissue.
2. Connective tissue.
3. Yellow elastic tissue.
4. Striped muscular fibre.
5. Unstriped " "
6. Tendon, Long Section.
7. " Transverse Section.
8. Yellow Elastic Cartilage of Cow's Ear.
9. Hyaline Costal Cartilage.
10. Bone, Long Section.
11. " Transverse Section.
12. " Skull, Transverse Section.
13. Scalp, showing hair.
14. Nerve Fibres.
15. " Cells.
16. Skin, Vertical Section.
17. Tooth, " "
18. Capillaries in Pia-Mater.
19. Pigment Cells.
20. Lung of Cat Injected.
21. Liver " "
22. Brain " "
23. Kidney of Rabbit.
24. Ileum.

In case with trays. Objects lie flat, ... $16 00

Series No. 4. 48 Physiological Preparations (to supplement Series 2).

Division 1.—24 from the Human Subject.

1. Human Medulla oblongata, T. Sect.
2. " Pons Varolii, "
3. " Spinal Cord, "
4. " " " L. Sect.
5. " Pituitary Body, T. Sect.
6. " Liver, stained.
7. " Lung, "
8. " Kidney, "
9. " Spleen, "
10. " Heart, "
11. " Lung of still-born infant, Injected.
12. " Supra-renal Capsule, T. S.
13. Human Lymph. Gland, T. S., Stnd.
14. " Mammary Gland, T. S., Stnd.
15. " Prostate " " "
16. " Testicle, Adult " "
17. " Ovary Gland, " "
18. " Penis of Infant, " Inject.
19. " Uterus, Adult, " Stnd.
20. " Umbilical Cord, " "
21. " Scrotum, V. S. "
22. " Larynx of Infant, T. S., Injected.
23. " Eyelid of Infant, V. S., Injected.
24. " Pancreas, T. S., Stained.

Division 2.—24 from the Lower Animals.

25. Cat—Spinal Cord, T. S., Stained.
26. " Medulla, " "
27. " Œsophagus, " Injected.
28. " Pad of Foot, V. S., "
29. " Bladder, T. S., "
30. " Testicle, " "
31. " Ovary, " "
32. " Adipose Tissue, "
33. " Muscular " "
34. Monkey—Penis, T. S., Stained.
35. " Testicle, " "
36. Rat—Ileum, " "
37. " Stomach, T. S., Injected.
38. Rat—Brain, T. S., Injected.
39. " Kidney, " "
40. Fowl—Kidney, " "
41. " Lung, " "
42. " Glandular Stomach, T. S., Injected.
43. Snake—Liver, T. S., Stained.
44. " Lung, " "
45. " Kidney, " "
46. Dog—Tongue, " Injected.
47. Starling—Glandular Stomach, T. S., Stained.
48. " Gizzard, Stained, T. S.

Series No. 5. 24 Preparations to illustrate the Anatomy of the Frog (Rana Temporaria).

1. Lung, Injected, Trans. Sect.
2. Liver, " "
3. " Stained, "
4. Kidney, Injected, "
5. " Stained, "
6. Tongue, " "
7. Stomach, " "
8. Colon, " "
9. Ileum, " "
10. Spleen, " "
11. Voluntary muscular fibre.
12. Involuntary " (Bladder.)
13. Nerve fibres.
14. Brain, Stained, Trans. Sect.
15. Spinal Cord, " "
16. Testicle, " "
17. Heart, " "
18. Web of Foot, Injected.
19. Skin.
20. Skin, Stained, Vert. Sect.
21. Femur, Trans. Sect.
22. Femur, Long Sect., showing articular cartilage.
23. Ovary with Ova.
24. Oviduct, Trans. Sect.

Series No. 6. 24 (Surgical) Pathological Preparations from the Human Subject.

1. Granulations in healing ulcer.
2. Inflamed Skin.
3. Inflamed subcutaneous tissue.
4. Chronic inflammation of an Artery (Atheroma).
5. Thickening of a Cerebral Artery in Syphilis with thrombosis.
6. Syphilitic Gumma, chronic inflammatory growth.
7. Syphilitic Chancre.
8. Nœvus (or Cavernous Tumor) of Scalp.
9. Enlargement of a Lymphatic Gland.
10. Simple Lymphadenoma.

Series No. 6.—Continued.

11. Cancer of Breast.
12. Cancer of Ovary.
13. Cancer of Prostate Gland.
14. Epithelioma of Lip.
15. Adenoid Tumor of Breast.
16. Cystic Enlargement of Thyroid body (Bronchocele).
17. Fibroid Tumor of Uterus.
18. Round-celled Sarcoma of Hand.
19. Alveolar " Scapula.
20. Spindle-celled " Uterus.
21. Enchondroma of Bone.
22. Myeloid Sarcoma of Bone.
23. Myxoma.
24. Inflamed Kidney after Stricture.

MEDICAL PATHOLOGY.

Lung—Miliary Tubercle.
Croupous Pneumonia.
Acute Bronchitis.
Syphilitic Phthisis.
Phthisis.
Tubercular Pneumonia.
Tubercle.
Pneumonia.
Pleurisy.
Emphysema.
Empyema.
Pyæmic Tuberculosis.
Carcinoma.
Catarrhal Pneumonia.
Hemorrhagic "
Embolic "
Round-celled Sarcoma.
Melanosarcoma.
Smothered Child.
Saw Grinder's.

Liver—Nutmeg.
Fatty Degeneration.
Amyloid "
Peculiar Fat in Lobules.
Caruinoma.
Cirrhosis.
Indurated with Atrophy of Lobules.
Cancer and Cirrhosis.
Syphilitic.
Abscess.
Red Atrophy.
Parenchymatous Inflammation.
Amyloid and Fatty Degeneration.
Cirrhotic with Vascular Tumor.

Pylorus—Carcinoma.

Stomach—Chronic Catarrh.
Passive Congestion.
Thickening.

Colon—Acute Inflammation.
Mucous Polypus.

Ileum—Tubercle.
Amyloid Degeneration.
Inflammation.
Enteritis.
Ulceration.
Typhoid Ulceration.

Spleen—Inflammation.
Tubercle.
Enlarged in Chronic Heart Disease.

Spleen—Amyloid (or Sago).
Calcareous Cicatrix.
Embolism.
Leucœmia.

Pancreas—Carcinoma.

Kidney—Suppuration.
Fatty.
Scarlet Fever.
Cirrhosis.
Hypertrophied.
Amyloid.
Bright's Disease.
" " Acute.
Indurated.
Post Scarlatinal Dropsy.
Dropsy.
Tubercle.
Cirrhotic and Amyloid.
Gouty or Red Degeneration.
Pyronephritis.
Acute interstitial Nephritis.
Chronic " "
Embolism.
Atrophy.
Medullary Cancer.

Brain—Cerebrum Meningitis.
" Acute Inflammation.
" Softening.
" General Paralysis.
" Atrophy.
Cerebellum, Locomotor Ataxia.
Dura Mater, much thickened.
Pons Variolii, General Paralysis.
" " Diabetes.
" " Locomotor Ataxia.
Medulla Oblongata } in Diabetes.
" Myelitis.
" Locomotor.
" Ataxia, etc.

Spinal Cord from the various regions in Tetanus.
Hydrophobia.
Locomotor Ataxia.
Degeneration of the Nerve Cells.
Fracture.
General Paralysis.
" " in Insanity.

MEDICAL PATHOLOGY—Continued.

Skin—Granulations in Healing Sores.
" of Ulcers.
Hypertrophied.
Pityriasis.
Tattooed.
Cancer.
Scarlet Fever.
Variola, Simple.
Icthyosis.
Variola, Hemorrhagic.
Lupus Vulgaris.
Small Pox, Simple.
" Hemorrhagic.
Glands—Carcinoma of Lymphatic.
" Prostate.
Supra-renal Carcinoma in Addison's Disease.
Prostate enlarged.
Glands—Hypertrophied from Neck.
Arteries—Cerebral (Atheroma of).
" organizing Thrombus in Syphilis.
Chronic Thickening.
Aortic Valve, ossified.
Heart—Pericarditis.
Fatty Degeneration.
" Infiltration.
Fibroid Degeneration.
Various—Muscle, Fatty Infiltration.
Diaphragm, Calcareous Nodule.
Muscle, Farcy Tubercle.
Uterus, Chronic Leucorrhœa.
Pseudohypertrophic Muscular Paralysis.
Trichinous Muscle, etc.

SURGICAL PATHOLOGY.

Cancer of Lymphatic Gland.
" Recurrent Fungoid of Breast.
" Breast.
" Prostate Gland.
" Ovary.
" Skin.
" Brain (Encephaloid).
" Jaw.
" Face.
Epithelioma of Vulva.
" Lip.
" Hand.
" Tongue.
" Foot.
" Penis.
" Jaw.
" Cheek.
" Leg.
Sarcomas—Periosteal of Humerus.
" Recurrent in Scalp.
" Testicle (Roundcelled).
" Retro Peritoneal.
" of Hand (Roundcelled.)
" " Femur.
" " Lung.
Alveolar of Scapula.
Cystic of Testicle.
Melanosarcoma of Lung.
Osteosarcoma of Knee.
Spindlecelled of Uterus.
" Frontal Bone.
" Mesentery.
" Lymphatic Gland.
Melanotic of Eyeball.
Various—Inflamed Muscular Tissue in Hip Disease.
Cystic Adenoma of Breast.
Softened Knee Joint.
Ulcer of Tongue.
Bronchocele.
Fibroid Degeneration of Testicle.
Various—Enlarged Prostate Gland.
Inflamed Skin.
Indurated Testicle.
Myeloid Tumor of Jaw.
Bony " "
Enlarged Tonsils.
Skin Plastic Effusion from Foot after Inflammation.
Papilloma of Thigh.
Nœvus from Occiput of Infant.
Simple Lymphadenoma from Neck.
Recurring Periosteal Tumor of Frontal Bone.
Enchondroma of Parotid Region.
Enlarged Strumous Gland from Neck.
Chronic Inflammation of a Lymphatic Gland.
Chronic Cystitis of Bladder.
Fibroid Cyst from Breast.
" " Patella.
" " Uterus.
" " Hand.
" " Jaw.
Inflamed Muscle.
Ulcer of Tongue.
Chancre of Prepuce.
Keloid Growth from Arm after Gunshot Wound.
Elephantiasis of Neck.
Soft Wart from Jaw.
Hard Wart from Back.
Submaxillary Lymphadenoma.
Enchondroma of Clavicle.
Cavernous Tumor of Tongue.
Uterine Polypus.
Gumma from Parietal Bone.
Caries of Bone.
Myxoma from Arm.
" " Ear.

PHYSIOLOGICAL PREPARATIONS.

(Injected—Stained—and both Injected and Stained.)

Brain—Human, Cerebellum.
" Cerebrum.
" Medulla oblongata.
" Pons Variolii.
Cat, Cerebrum.
" Cerebellum.
" Medulla oblongata.
Monkey, Cerebellum.
" Cerebrum.
" Medulla oblongata.
Spinal Cords—From various regions and trans. and long. sects.—
Human.
Cat.
Horse, etc.
Generative Organs, etc.
Human, Penis, Infant.
" Testicle, Adult.
" " Child.
" " Infant.
" Uterus, Adult.
" " Infant.
" Ovary, Adult.
" " Child.
" Umbilical Cord.
" Placenta.
Cat, Testicle.
" Ovary.
" Bladder.
Monkey, Penis.
" Testicle.
Rabbit, Penis.
Rat, Penis.
Tongue—Human, Adult and Child.
Cat and Kitten.
Rabbit.
Rat.
Puppy and Snake.
Ileum—Human, Trans. Sect.
Adult and Infant, Mucous Membrane.
Rabbit, Mucous Membrane.
Cat, " "
Puppy, " "
Colon—Rabbit, " "
Cat, " "
Kidney—Human, Adult and Child.
Snake (Injected) from Artery only.
Cat (from Artery only).
Rabbit (from both Artery and Vein).
Rat (from both Artery and Vein).
Fowl (from both artery and Vein).
Skin—Human and Cat.
Cuticle—Human.

Stomach—Human.
Cat.
Fowl.
Puppy.
Glands, etc.
Human, Thyroid.
" Submaxillary.
" Parotid.
" Prostate.
" Lymphatic.
" Mammary.
" " during Lactation.
" Thymus.
" Sublingual.
Cat, Lymphatic.
" Submaxillary.
" Suprarenal.
Lung—Human, Adult, Child and Fœtal.
Cat (Air Cells inflated).
Fowl.
Snake.
Liver—Human.
Cat, etc.
Various Organs—
Human, Larynx of Infant.
" " Fœtal.
" Optic Nerve.
" Nerves, various.
" Scalp.
" " of Negro.
" Pancreas.
" Spleen.
" Tendon.
" Arteries.
" Cartilages, various.
" Bones, "
" Tissues, "
" Eyelid.
" Nose.
" Suprarenal Capsule, etc.
Cat, Œsophagus.
" Pad of Foot.
" Olfactory Bulb.
" Muscle.
" Bladder.
Sheep, Optic Nerve.
Monkey, Bladder, etc.
Dog, Tail of Puppy.
" Foot of "
Frog, Preparations of all the Organs, either Injected or Stained.

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Uric Acid from Boa-constrictor.
Urea. Urate of Ammonia. Urate of Soda.
Nitrate of Urea. Oxalate of Urea.
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Hippuric Acid, Typical form.
Oxalate of Lime, Octohedral form.
" " Dumb-bell form.
Carbonate of Lime, from Man and Horse.
Oxalurate of Ammonia. Murexide. Cholesterine. Sugar of Milk. Sugar in Diabetes, Cystine or Cystic Oxide.
Spermatozoa from Man, Bird, Boar, Elephant, Fish, Mouse, Dog, Horse, Newt, Rat, Rabbit, Hare, Rhinoceros, Ram, Goat, Camel, Deer, Wolf, Ass.

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" subsessilis.
Actinocyclus Ralfsii.
Actinoptychus splendens.
" undulatus.
Amphiprora alata.
Amphitetras antediluviana.
Amphora laevis.
Arachnoidiscus ornatus.
Aulacodiscus Crux.
Auliscus sculptus.
Biddulphia laevis.
" pulchella.
" rhombus.
Campylodiscus limbatus.
" Echineis.
" Clypeus.
" spiralis.
Climacosphenia moniligera.
Ceratoneis Arcus.
" lunaris.
Cocconeis placentula.
" Pediculus.
" Scutellum.
Cocconema Cistula.
" lanceolatum.
Colletonema vulgare.
Coscinodiscus Oculus Iridis.
" radiatus.
Cyclotella Meneghiniana.
Cylindrotheca gracilis.
Cymatopleura Solea.
Cymbella amphicephala.
" affinis.
" gastroides.
" helvetica.
" ventricosa.
Diatoma elongatum.
" vulgare.
Endostaurum Cruzigerum.
Epithemia constricta.
" gibba.
" Hyndmannii.
" turgida.
Eunotia undulata.
Eupodiscus Argus.
Fragilaria intermedia.
" minima.
" virescens.
Gephyria media.
Gomphonema acuminatum.
" commune.
" geminatum.
" gracile.
" robustum.
" olivaceum.
Grammonema striatulum.
Homoeocladia Martiniana.
Isthmia enervis.
Licomphora Pappeana.
Mastogloia Braunii.
Melosira arenaria.

Melosira Borrerii.
" crenulata.
" nummuloides.
" varians.
Meridion circulare.
" constrictum.
Navicula Carassius.
" Clepsydra.
" didyma.
" Entomon.
" nobilis.
" major.
" gibba.
" gibba forma gracilis.
" mesolepta.
" oblonga.
" radiosa.
" amphisbaena.
" serians.
" hemiptera.
" slesvicensis.
" sphaerophora.
" splendida.
Nitzschia amphioxys.
" hungarica.
" media.
" obtusa.
" sigma.
Nitzschia Schweinfurthii.
Odontidium hiemale.
Odontodiscus subtillis.
Pleurosigma acuminatum.
Podosira maculata.
Pyxidicula cruciata.
Rhabdonema adriaticum.
" arcuatum.
Rhoicosphenia curvata.
Schizonema Grevillei.
Scoliopleura tumidum.
Solium exculptum.
Stauroneis gracilis.
" lanceoltata.
" Phoenicenteron.
Stephanodiscus Niagarae.
Surirella striatula.
Synedra affinis.
" familiaris.
" capitata.
" pulchella.
" tabulata.
" splendens.
Tabellaria fenestrata.
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Triceratium membranaceum.
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Cymatopleura elliptica.
Fragilaria capucina.
Frustulia saxonica.
Navicula cuspidata.
" rhomboides.
Grammatophora marina.
" subtillissima.
Hyalodiscus subtilis.
" Stelliger.
Nitzschia sigmoidea.
" obtusa var. scalpeliformis.
Pleurosigma angulatum.
" attenuatum.
" acuminatum.
" aestuarii.
" balticum.
" formosum forma gigantea.
" Hippocampus.
" Spencerii.
Rhizosolenia styliformis.
Striatella unipunctata.
Surirella Gemma.
Triceratium favus.

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I.	II.
1	1 .....
2	2 .....
3	3 .....
4	4 .....
5	5 .....
6	6 .....

III.	IV.
1	1 .....
2	2 .....
3	3 .....
4	4 .....
5	5 .....
6	6 .....

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Black-tip Fly, Ortalis vibrans.
Cattle-fly, Musca corvina. Bombilus major.
Corn-fly, Empis livida. E. stercorea.
Crane-fly, Tipula, oleracea.
Dunghill-fly, Spherocera subaltans.
Dung-fly, Scatophaga merdana and others.
Drone-fly, Helophilus pendulus.
Flirt-fly, Sepsis punctum.
Fantail-fly, Dolichopus Æneus.
Fungus-fly, Mycetophila, various.
Gnat, Culex pipiens (Sexes), the Male.
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" Ringed, Culex annulatus.
" Plumed, Chironomus plumosa.
" Winter, Trichocera hiemalis.
" Wood, Sciara brunipes.
Grass-fly, Opomyza germinationis.
Hairy-fly, Bibio Marci, B. Johannis.
Hawk-fly, Dioctria rufipes.
Herbage-fly, Platypalpus fasciatus.
His grace, Calobata petronella.
House-fly, Musca domestica.
Ichneumon-fly, Ophion luteum.
Lace-Wing Fly, Chrysopa perla.
Leaf Insect, Phyllophorella acerina.
Mayflower-fly, Dilophus.
Merrydancer, Hilara maura
Mosquito, Culex Mosquito, various.
Midge, Psychoda.
Mud-fly, Borborus longipennis.
Marsh-fly, Tetanocera aratoria.
Marsh Carne-fly, Phycoptera.
May-fly, Ephemera vulgata.
Nettle-fly, Platystoma seminationis.
Pearl-fly, Sialis lutarius.
Scorpion-fly, Panorpa communis.
Shadow Watcher, Syritta pipiens.
Snipe-fly, Leptis scolopacea.
Snout-fly, Rhingea campestris.
Saw-fly, Allantus scolopacea.
Thrips, Phlæothrips coriaceus.
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Unicorn-fly, Odontocera denticornis.
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Centipede, Lithobius forcipatus.
Millipede, Geophilus electricus.
Skin of Caterpillar, many species.
" Silk worm, Bombyx mori.
Corn-bug, Miris erraticus.
Cuckoo-spit, Aphrophora spumaria.
Collared Florist, Anthobium torquatum.
Cardinal-beetle, Pyrochroa rubens.
Beetle, Cercopsis sanguinolenta.
Earwig, Forficula auricularia.
Frog-hopper, Amblycephalus viridis.

Grasshopper, Locusta viridis.
Glow-worm, Lampyrus noctiluca. (Sexes.)
Grass-flea, Thyamis femoralis.
Lady-bird, Coccinella variabilis, etc.
Parsnip-beetle, Anaspis melanopa.
Pond-beetle, Lactophilus minutus.
Mud-beetle, Hyphydrus ovatus.
Marsh-flea, Delphax lineata.
Raspberry-beetle.
Soldier-beetle, Telephorus melanurus.
Sailor-beetle, Halipus lineatocollis.
Scissor-bug, Capsus planicornis.
Thistle-beetle, Crepidodera ferruginea.
Wood-beetle, Leptura levis.
Water-beetle, Hygrotus elegans.
Water-bug, Corixa fossarum.
Water-boatman, Notonecta glauca.
Water-scorpion, Nepa cinerea.
Pond-skater, Gerris lacustris.
Ditch-skater, Velia rivulorum.
One-Clawed Water-bug, Naucoris cimicoides.
Tingis, Larva, Pupa, Imago, various.
Pseudo Scorpion, Chelifer cancroides.
Earth-mite, Trombidium.

Spiders.

Bush-spider, Agelena nava.
Garden-spider, Epeira diadema.
Ground-spider, Lycosa agrestica.
House-spider, Aranea labyrinthica.
Harvest spider, Phalangium cornutum.
Hunting-spider, Drassus lucifergus.
Shepherd-spider, Opillio.
Water-spider, Argyroneta aquatica.
Water-wolf, Lycosa aquatica.

Larvæ and Pupæ.

Pupa of water-boatman.
Larva of Ant-lion, Myrmelio Formicarius.
" Cardinal-beetle, Pyrochroa coccinea.
" Dragon-fly, Ermine-moth.
" May-fly, Lace-Wing Fly.
" Water-beetles, various.
" and Pupa of Gnat. In Fluid.
" Flea, House and Blow-fly.
" Bot-fly in Egg, on hair of Horse.
" Staphylinus, Devil's Coach-horse.
" Lady-bird, Coccinella, also Pupa.
" Click-beetle (Wire-worm).

About twice the number of Species here named are usually in Stock, and the Sexes of some can be supplied.

PARTS OF INSECTS.

50 cents each. $5.00 per dozen.

Antennæ of Cockchafer, sexes, House-fly and Blow-fly, Moths, Gnat, sexes.

Head of Butterflies and Moths, Crane-fly, Gnat, Mosquito (Lancets), Cockchafer, Crane-fly, Dragon-fly, House-fly, Humble-bee, Butterfly.

Beetle, prepared to show multiplied images reflected from facets of Cornea.

Gizzard of Dytiscus, Grasshopper, Katydid, Cricket, Flea.

Stomach of Beetle, Blow-fly.

Foot of Caterpillar.

Leg and Foot of Blow-fly, Drone-fly, Dung-fly, Dytiscus, Frog-hopper, Gyrinus, Honey-bee, Hawk-fly, Hornet, Ophion, Pearl-fly, Saw-fly, Spiders, various, Wasp.

Mouth and Jaws of Wasp, Spiders.

Feathered Oar of Corixa, Dytiscus.

Expanding Paddle, Gyrinus.

Lancets of Flea, Bed-bug, Gad-fly, Musquito, Gnat.

Ovipositor of Cuckoo-spit, Katydid, Cricket, Crane-fly, Blow-fly, Drone-fly, Dragon-fly, Saw-fly, Frog-hopper, Corn-bug.

Proboscis or Tongue of Butterfly and Moth, Honey-bee, Humble-bee, Blow-fly, House-fly, Cricket, Hawk-fly, Drone-fly, Rhingia.

Reproductive Organs, Male Wasp, Hornet.

Scales from Wings of Death's-head Moth, Oak-egger, Cloth-moth, Paris Butterfly, Fritillary, Giant Silk-moth, Japan, and many others.

Spinneret of Silkworm, Garden-spider.
Skin of Caterpillar, Chrysalis, Silkworm, Garden-spider.
Spiracles of Blow-fly, Drone-fly, Cockchafer, Dytiscus, Privet Caterpillar.
Sting of Bee. Hornet. Wasp.
" with poison glaud. $1.00
Tail of Dolichopus Æneus.
Tracheæ of Silkworm, Blow-fly, and ultimate ramification in stomach of Bee, $1.00, in nerves of Caterpillar, $1.00. Intestines of Blow-fly.
Halteres of Crane-fly, Rhingia, Drone-fly, Blow-fly.
Wings of Bee, with hooklets, Hornet, with hooklets, Wasp, with hooklets, Blow-fly, Butterflies, various, Moths, various, Mosquitoes.
Elytron of Corixa fossarum, Water-beetles, various.
Winglet of Blow-fly.
Anatomy of the Blow-fly, 12 Slides in a box, $6.00

OPAQUE AND BINOCULAR OBJECTS.

50 and 75 cents each. $5.00 and $7.50 per dozen.

Whole Insects, etc.

Tingis arcuata.
Beetles and Weevils, various.
Cicada from Maryland.
Gall-fly, Typhloryba uloni.
Asparagus-beetle. House-fly.
British Diamond-beetle.
Eggs of Insects, various; Parasite of Pigeon, Hornbill, Larvæ of Oakegger.
Eyes showing facets, from Beetle, House-fly, Butterfly, Moth, Wasp, Dragon-fly.
Eyes of Garden-spider.
Aphis pierced by Ichneumon-fly.
Legs of Dytiscus marginalis.
Heads and Parts of Beetles.
Cyphus germari.
Cicindela sylvatica.
Eustales adamantinis.
Chrysolophus.
Curculio imperialis.
Eupholus.
Hypomeces squamosus.
Golden girdle.
Exuvium of Myriapoda, Polyxenus.
Wing of Magpie-moth, Butterfly, Azure Blue; Cloth-moth, Vaporer; Alexis, Clouded Yellow; Fritillary, Morphomenelaus, Paris, Peacock, Copper, Tortoise-shell, Red Admiral.
Palate of Haliotis tuberculata, Limpet, Patella vulgaris; Periwinkle, Littorina littoralis; Trochus zizyphinus, Whelk, Buccinum undatum; Gizzard of Cricket.
Foraminifera, from Adriatic Sea, Bay of Bengal, Levant, River Nene, Caxhaven.
Polycystina, Barbadoes, various.
Fossil infusoria.

Vegetable.

Leaf of Deutzia, Nettle, with Stings, Elæagnus, Onosma taurica, Alyssum Olympicum.
Skeleton Leaf of Box-tree and Indian Ivy.
Section of Leaf of Orchid, Stem of Clematis, Sugar-cane, Shell of Mexican Gourd, Pith of Rice Paper-plant.
Spores of Quill-wort, from Cashmir.
Seeds of Antirrhinum, Poppy, Henbane Lobel's Catch-fly, Orchis, Portulaca.
Pollen of Hollyhock, Mallow, Portugal Pine, Geranium, Passion-flower, Lily, Scotch Fir.
Peristomes of Mosses, many species.
Funaria hygrometrica, mounted in a cell for Hygrometric experiment.

Polyzoa, Corallines, etc.

Anguinaria spatulata.
Bicellaria ciliata. B. grandis.
Bugula avicularia.
Catenicella plagiostoma.
Cellularia avicularis.
Crisea eburnea. Flustra foliacea.
Membranipora pilosa.
Notamia bursaria.
Sertularia operculata.
Diatomaceæ on Sea-weed, in situ.
Gemmules of Sponge.
Hairs of Peccary, sections.
Isthmia nervosa and enervis.

Orthosira arenaria.
Shell of Orbitolite.
Spines and Shell of Spatangus.
Spicules of Gorgonias.
Young Oysters.
Feathers of Humming-birds, Love-bird, Peacock, Rifle-bird, Australia.
Skin of Sole, Dog-fish, White Shark.
Brittle Star-fish.
Sun Star-fish.
Bones of Ophiocoma rosula.
Pedicellaria of Echinus sphæra, Echinus esculentus, Uraster rubens.
Spines of Palmipes membranaceus.
Sponge with Spicules, in situ.
Spider-crab.
Mantis Shrimp.

Opaque Minerals, etc.

Avanturine (artificial). Hypersthene.
Antimony, Needle form. Red, Oxysulphuret.
Crystals of Berberine, Picrotoxine.
Oxalate of Lime. Crystalline Indigo.
Bismuth. Sulphuret of Iron.
Crystalline Oxide of Lead, Lead Ore.
" Silver, Electro deposit.
Native Gold from Peru, Natal and Persia.
Gold Nuggets, California.
" Dust, British Columbia.
" Sand with Quartz, Australia.
" Leaf transmitting Green Light.
" Pure and Brilliant. Mosaic Gold.
Fibrous or Moss Copper, Nat. formation.
Granular Copper Ore, South America.
Peacock and Ruby Copper.
Iridescent Oxide of Lead. Pure Iridium.
Crystals of Titanium, from Blast Furnace.
Crystalline Lava, from Mount Vesuvius.
Decomposed Glass from Pompeii.
Sand or Dust from Eruption of Vesuvius, 1872.
Mysterious Dendritic spots on Writing Paper.

POLARISCOPE OBJECTS.

50 cents each. $5.00 per dozen.

Chemical Crystals.

Asparagine.
Aspartic Acid.
Bitartrate of Ammonia.
Borax. Boracic Acid.
Carbozotate of Potash.
Carbonate of Lime, from Horse.
" " " Boa-constrictor.
Creatin. Cholesterin.
Chlorate of Potash.
Chloride of Barium.
Cinchonine.
Cinchonidine.
Citric acid.
Ferrocyanide of potassium.
Iodide of Potassium.
Iodo-disulphate of Quinine.
Murexide (Dichromatic).
Naphthaline.
Nitro-prusside of Sodium.
Oxalate of Lime.
Oxalate of Ammonia.
Oxalate of Chromium and Potash.
Oxalic Acid.
Oxalurate of Ammonia.
Platino-cyanide of Magnesia.
" " Barium.
Platino-cyanide of Thallium.
Pulmose Quinidine.
Quinidine. Santonine.
Salignine. Salicine.
Strychnine. Sugar.
Sulphate of Cadmium.
" Nickel and Potash.
" Copper.
" Spiral form.
" Copper and Magnesia.
Tartaric Acid.
Thionurate of Ammonia.
Triple Phosphate, various forms.
Urea. Uric Acid.
Uric Acid from Boa-constrictor.
Wine Crystals.
Bitartrate of Potash.

Animal Substances.

Palate of Haliotis tuberculata, Limpet, Patella vulgaris, Nassa reticulata, Periwinkle, Trochus zizyphinus, Whelk.

Claw of Ourang-outang, Lynx, Sloth, Lioness, Wild Cat, Fowl, Polar Bear, Seal.

Finger Nail—Human. Cuttings.
Toe Nail, Transverse Section.
Corns of Elephant.
" Human.
Foot-Pad of Dromedary, Cat.

Hoof of Antelope, Elk, Pig, Ox, Mustang, Reindeer, Zebra.

Horn of American Bison, Antelope, Brahmin Bull, African Rhinoceros, Indian Rhinoceros.
Quill of Porcupine.
Whisker of Walrus.
Spines of Hedgehog.
Cat's Tongue.
Section of Cat's Tongue, Nose and Lip.
Bone of Cuttle-fish.

Whalebone, Finland Whale, Bottlenose, Beluga Catodon.
Embryo Oysters.
Exuvium of Prawn.
Teeth of Medicinal Leech.
Tendon Achilles, Human.
Tendon of Ostrich.
Leg of Dytiscus.
Elytron of Dytiscus.

POLARISCOPE OBJECTS.

Animal Substances.

Skin, Human (vertical section); Negro Scalp, with incipient Curl in Roots of Hair; Alligator of the Nile; Giraffe, with Hair; Lip of Calf, with Hair; Lip of Cat, with Hair; Nose of Cat; Eel, with Scales *in situ;* Sole, with Scales *in situ;* Synapta, Anchors *in situ.*
Scales of Carp, Eel, Perch, Sole, Gudgeon and Mullet.
Tail of Whitebait.
Crystals of Carbonate of Lime, in Tail of Prawn and Shrimp.
Plates from Skin of Holothuria.
Anchors, etc., from Synapta.
Hair, Human, White with Age, Roots and Eyebrows, Shavings of Beard, Albino Girl, Infant, Young Lady's Eyelash, Gorilla, Brahmin Bull, Reindeer, Polar Bear, White Mouse, Persian Cat, Angora Goat, Mohair, Elephant's Tail, section.

Stones and Minerals. 75 cts. each.

Actinolite. Avanturine.
Agates, various.
Asbestiform Serpentine.
Carbonate of Lime.
Carrara Marble.
Gibraltar Rock.
Granite, various localities.
Labrador Feldspar.
Jasper with Amethyst.
Quartz Rock, various.
Quartzite, Mont Blanc.
Satin Spar. Sandstone.
Selenites, various colors.
Sulphate of Baryta.
Zeolite from Giant's Causeway.

Polariscope Objects Moving in Fluid

Animal Substances, Mixed.
Actinolite.
Brazilian Pebble Fragments.
Crystalline Sulphate of Lime.
Fibrous Sulphate of Lime.
Rolling Stones, various.
Young Oysters.

Vegetable Substances.

Starch from Arrowroot, Calabar Bean, Colchicum autumnale, Potato, Oats, Rice, Sago, Palm, Tapioca, Tous les Mois, Ginger, Maize, Barley, Wheat.
Section of Potato, Starch *in situ.*
Cuticle of Leaf of Correa cardinalis, Deutzia scabra, Elæagnus, Onosma taurica.

Silicious Cuticles—From Araucaria imbricata, Bamboo-cane, Sugar-cane, Equisetum arvense, Dutch Rush, E. hyemale Indian Corn, Canary-seed, Husk of Rice Grain, Straw of Rice, Leaf of Wheat.
Fibro Cells from Ærides roseum, Oncidium bicallosum.
Scalariform vessels from Fern, Dicksonia Antarctica.
Spiral vessels Rhubarb.
Fern Scales, Cheilanthes Eckloniana, Elaphoglossum squamosum, Nothochlæna maranta, Nothochlæna lævis.
Stellate Hairs from Elæagnus.
Wing of Seed of Eccremocarpus.

VEGETABLE PREPARATIONS.

60 cents each. . . . . $6.00 per dozen.

Sections of Woods, Stems, etc.

The number 3 indicates that Three Sections of Stems are on one Slide, Transverse, Vertical and Radial.

Arancaria excelsa, 3.
Apple-tree, Pyrus malus, 3.
Asparagus, Asparagus officinalis.
Aristolochia sipho, Ornithocephalus.
Baobab-tree, Adansonia digitata.
Berberry, Berberis vulgaris.
Beech, Fagus sylvatica, 3.
Brake-fern, Pteris aquilina.
Brava, Cissampelos Pereira.
Burdock, Arcticum lappa.
Butcher's Broom, Ruscus aculcatus.
Cane, Bamboo, 3.
Bambusa, 3, Malacca, Calamus scipionum, Rattan, Calamus rotang, 3, Sugar, Saccharum officinarum, 3, Wanghae.
Catalpa syringæfolia, 3.
Cedar of Lebanon, Cedrus Libanus, 3.
Cherry-tree, Cerasus communis, 3.
Cinnamon, Cinnamonum Zeylanicum.
Chili Pine, Araucaria imbricata, 3.
Cocoa-nut Palm, Cocus comosa.
Cork-tree, Quercus suber, 3.
Cutleya Leopoldii.
Dendrobium nobile, speciosum.
Dog-rose, Rosa canina.
Dragon-tree, Dracœna ferrea.
Date-palm, Phœnix humilis.
Elder, Sambucus nigra, 3.
Fennel, Fœniculum officinale.
Fig-tree, Ficus carica.
Gesnera grandis.
Gum-tree, Eucalyptus, 3.
Gutta-Percha Tree, Isonandra gutta. 3.
Grape-vine, Vitis vinifera.
Hibiscus Africanus, 3.
Ivy, Hedra helix.
India-rubber, Ficus elastica.
Jasmine.
Jasminum officinale.
Lavender, Lavandula vera.
Lace Bark, Lagetta lintearia, 3.
Land Rush, Juncus communis.
Larch, Larix, 3.
Larix Europæus, 3.
Lemon-tree, Citrus limonum.
Magnolia grandiflora.
Mahogany, Swietenia mahogoni, 3.
Maple, Acer campestre, 3.
Mimosa Nilotica.
Mulberry, Morus Nigra, 3.
Miltonia cuncata.
Mistletoe, Viscum album.
Oak, Quercus pedunculata, 3.
Orange-tree, Citrus auranteum, 3.
Pampas-grass, Gynerium argenteum.
Passion-flower, Passiflora quadrangularis.
Pepper (Australia), Piper Alba.
" (Malacca), P. Nigrum.
Pear-tree, Pyrus domestica.
Pine, Pinus strobus, 3.
Pine-apple, Ananas lucida.
Pilea Smilacifolia.
Plane-tree, Platanus Occidentalis, 3.
Sanseviera Zeylanica.
Sarsaparilla, Smilax officinalis.
Satin-wood, Chloroxylon Swietenia.
Screw-pine, Pandanus odoratissimus.
Sea Rush, Juncus maritimus.
Sunflower, Helianthus annuus.
Sandal-wood, Santalum album, 3.
Tea-tree, Lycium barbarum.
Traveller's Joy, Clematis vitalba.
Upas (Java), Antiaris toxicaria, 3.
Water-plantain, Alisma plantago.
Water-lily, Nuphar lutcum.
Walnut, Juglans regia, 3.
Wellingtonia gigantea, 3.
Willow, Salix alba, 3.
Yew, Taxus baccata, 3.
Section of Petiole of Arum, Cinnamon, Date-palm, India-rubber, Oleander.
Bulb of Orchid, sections.
Pith of Rice Paper-tree.
Root of Wellingtonia gigantea.
Root-fern, Petris aquilina.
Roots of various Trees.
Bark " "

MICRO-PHOTOGRAPHS.

60 cents each. . . . $6.00 per dozen.

Lincoln Cathedral.
The Blind Fiddler.
Equestrian Statue, Richard II.
The Dame's School.
Cupid and Psyche.
Laying Down the Law.
The Planet Jupiter, Belts and Moons.
Cathedral of Milan.
Hindoo Mosque, A. D. 1400.
York Minster.
£1000 Bank-Note.
Statue of Sabrina.
Title-Page of *Punch*.
Fingal's Cave.
Happy as a King.
Melrose Abbey.
Una and the Lion.
The Moon.
The Ten Commandments.
The Lord's Prayer.
The Origin of Species.
View in the Alps.
German Iron-Clad.
Bridge at Hamburg.
West Indian View.
"Unser Fritz."
Steamship Saxonia.
Falls of Niagara.
Prussian Bank-Note, 25 Thalers.
Bolton Abbey in the olden time.
The Giant's Causeway.
The Emperor Napoleon.
The Fall of Nineveh.
The Alhambra in Singapore Harbor.
The Ascent of Mont Blanc.
The Planet Saturn, Rings of.
Belfast Naturalists' Club.
The Crucifixion (M. Angelo).
Hagar and Ishmael.
The Horse Fair (Mlle. Bonheur).
The South Sea Bubble.
Balmoral Castle.
The Derby Day.
Raising the May-Pole.
The Maid of Saragossa.
Dickens' Christmas Carol.
View of Stockholm.
The Proposal.
Lord Byron.
Head of Christ.
London.
Alpine Glacier.
View in Heligoland.
Palace in Potsdam.
Ruins of Church, Norway.
View of Hammerfest.
St. Stephen's Church, Vienna.
Cupid.
Luna and Endymion.
Apollo and Daphne.
View in Norway.
Temple of Vesta, Rome.
Map of North America.
View in Pompeii.
View of Rome.
100-Thaler Bank-Note.
Grotto at Capri.
Un portant mal Payi.
Declaration of Independence, $1.00.

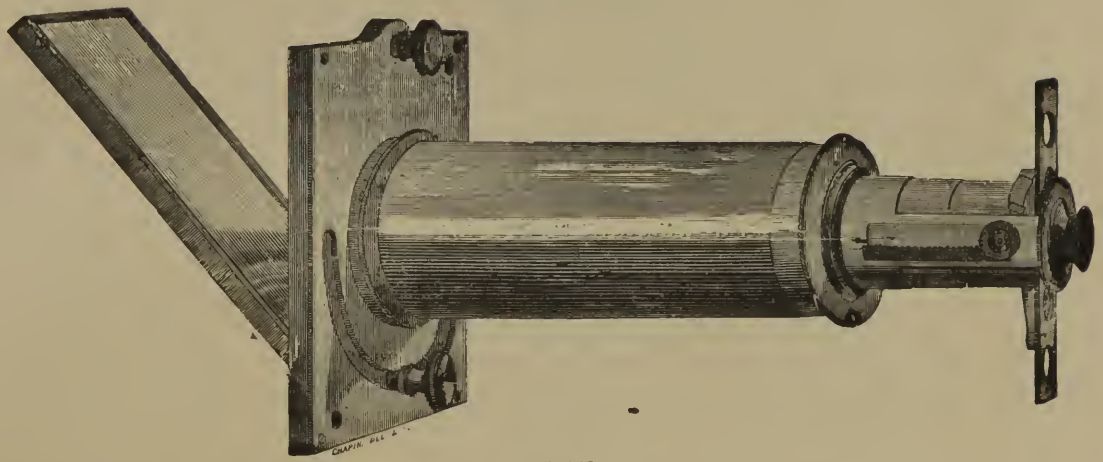
SERIES OF POPULAR OBJECTS.

25 cents each. $3.00 per dozen. $5.50 for two dozen in box.

Six dozen, in handsome Mahogany case, with twelve trays and lock, . . . $20.00

In order to meet the demand for objects of a popular character, at very low prices, we have prepared a very large variety of beautiful, interesting and valuable subjects, at the above cheap rates. These comprise about one hundred varieties of Diatoms, many species of Algæ, Marine and Fresh-water, Foramnifera, Polycistina, Spicules of Synapta, Gorgonia and Sponges, insect parts in immense variety—opaque and transparent, some whole insects, vegetable preparations of every kind, including some Double Stainings; in short, a wonderful variety of objects deservedly *popular*. They are all clean, neatly mounted and correctly named, and though not *selected* as those named in the foregoing lists, many of them will be found fully equal in all particulars to the more expensive ones. An assortment will be sent on selection, the same as the others.

SOLAR MICROSCOPES.



445–446.

The **Solar Microscope** is an instrument for magnifying ordinary *Microscope Objects* to the extent of from ten to twenty feet in diameter, and exhibiting them on a screen in a darkened room before a class, or audience, by means of the sun's rays, reflected by a large mirror.

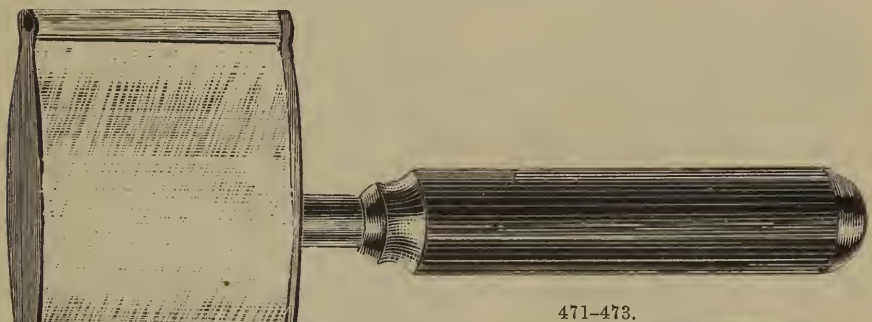
DIRECTIONS FOR USING THE SOLAR MICROSCOPE.

Select a window into which the sun is shining, and a hole being made about six inches in diameter in the window shutter, or in a board provided for the purpose, into which the instrument is placed and secured, the mirror remaining outside of the shutter, and the long tube or body of the instrument inside. The room is darkened as much as possible, so that no light may enter but that which enters through the body of the instrument. The mirror is to be turned by the milled head screws till the rays of the sun pass directly through the tube and form a large and brilliant circle of light on the screen, which may be placed at a distance of ten to twenty feet. The screen is made of white muslin, and the object may be seen with equal distinctness on either side. The Slide containing the object to be magnified is held in its place by means of a spiral spring, and a sharp definition or focus is obtained by turning the milled head focusing screw at the side.

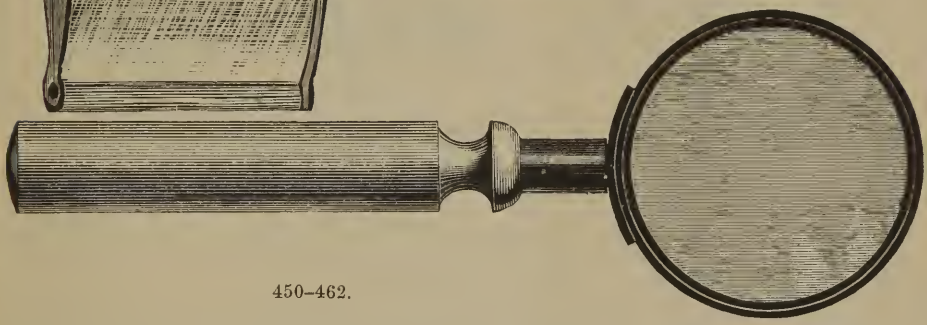
445. SOLAR MICROSCOPE, of Brass, having 1 inch, ½ inch, ¼ inch Achromatic Objectives, ... $50 00

446. SOLAR MICROSCOPE, of Brass, *a superior instrument*, having 1 inch, ½ inch, ¼ inch Achromatic Objectives, ... 75 00

READING AND PICTURE GLASSES.



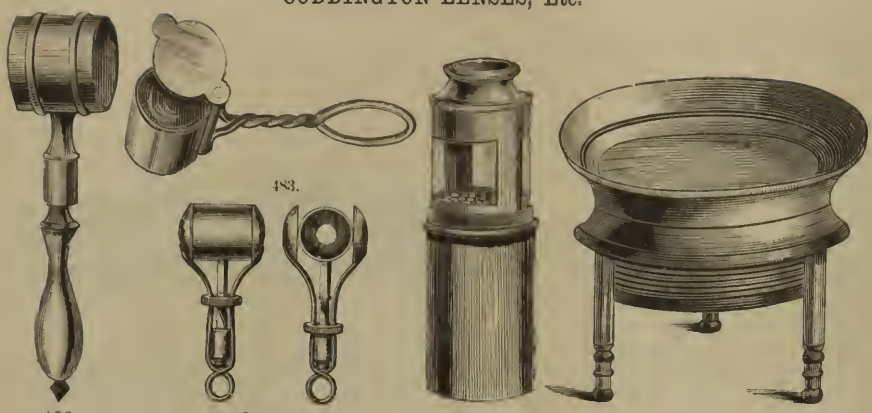
471–473.



450–462.

No.		Price.
450.	Reading Glass, oxidized metal frame, double convex lens, 2 inch. diameter,	$0 75
451.	" " " 2½ "	1 25
452.	" " " 3 "	1 50
453.	" " " 3½ "	2 00
454.	" " " 4 "	3 00
455.	" German Silver frame, a superior article, 2 "	1 00
456.	" " " 2½ "	1 50
457.	" " " 3 "	2 00
458.	" " " 3½ "	2 50
459.	" " " 4 "	3 50
460.	" " " 4½ "	4 50
461.	" " " 5 "	6 00
462.	" " " 5½ "	7 00
463.	Gallery Glass, " " 8 "	10 00
464.	Reading Glass, gilt metal frame, ivory handle, one double convex lens, 2 inches diameter,	1 50
465.	Reading Glass, gilt metal frame, ivory handle, one double convex lens, 2½ inches diameter,	2 25
466.	Reading Glass, gilt metal frame, ivory handle, one double convex lens, 3 inches diameter,	3 00
467.	Reading Glass, gilt metal frame, ivory handle, double convex lens, 4 inches diameter,	5 00
468.	Reading Glass, gilt metal frame, ivory handle, double convex lens, 4½ inches diameter,	7 00
469.	Reading Glass, gilt metal frame, ivory handle, double convex lens, 5 inches diameter,	8 50
470.	Gallery Glass, gilt metal frame, ivory handle, double convex lens, 8 inches diameter,	15 00
471.	Reading Glass, German silver frame, black handle, 2x3 inches,	2 50
472.	" " " $2\frac{3}{16}$x3¼ inches,	3 50
473.	" " " $2\frac{5}{16}$x3¾ "	4 50

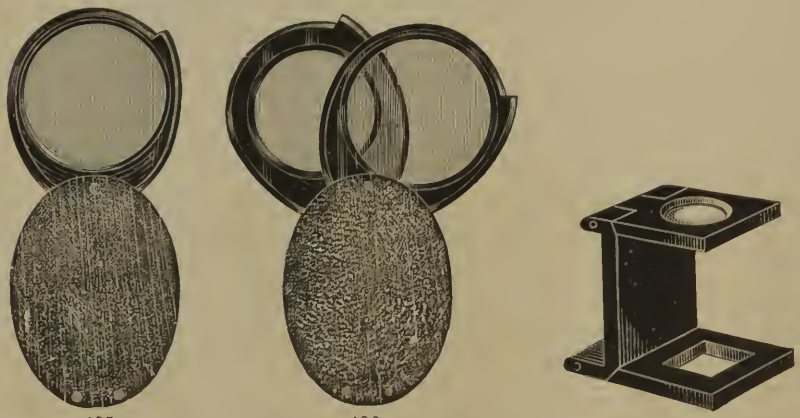
CODDINGTON LENSES, Etc.



482. 484–485. 486. 488.

No.		Price.
480.	Coddington Lens, Brass, with handle, large,	$2 00
481.	" " " " medium,	1 50
482.	" " " " small,	1 00
483.	" " in small Silver case, very powerful,	3 50
484.	" " in smaller " "	7 50
485.	" " solid Gold case, "	20 00
486.	Microscope, with Glass Cage for Seeds and Live Insects, small size,	1 00
487.	" " " " large "	1 50
488.	" on three legs, Brass, with Adjusting Screw,	1 00

GERMAN SILVER POCKET MAGNIFIERS.



495. 496. 501.

495.	German Silver Pocket Magnifier, 1⅛ inch. diameter, single,	$1 00
496.	" " " " " " double,	1 25
497.	" " " " " " triple,	1 50
498.	" " " " 1⅜ inch. " single,	1 00
499.	" " " " " " double,	1 50
500.	" " " " " " triple,	1 75
501.	Linen Provers, Brass, for counting Threads in Cotton, Silk, etc.,	50 cents and 75
502.	" German Silver, " " "	$1 00 and $1 25

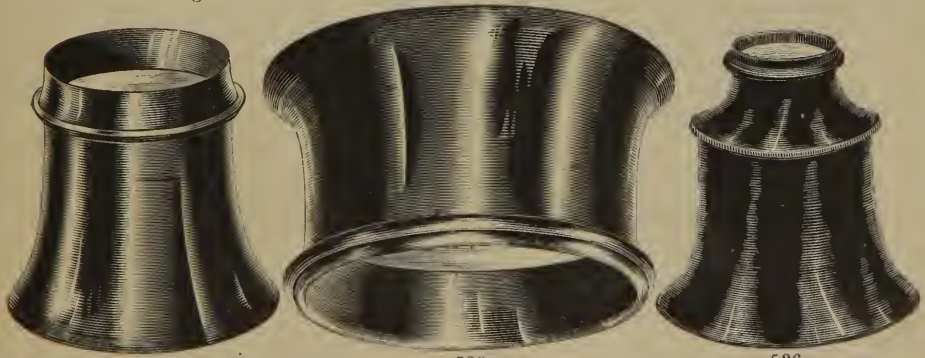
POCKET MAGNIFIERS.



No.								Price.
510.	Hard rubber case and frame,	round form,	1	double convex lens,	¾	in.	diam.	$0 30
511.	"	"	1	"	1	"		40
512.	"	"	1	"	1¼	"		60
513.	"	"	1	"	1¾	"		90
514.	"	"	2	"	1	"		80
515.	"	"	2	"	1¼	"		90
516.	"	bellows form,	1	"	¾	"		40
517.	"	"	1	"	1	"		60
518.	"	"	2	"	¾	"		65
519.	"	"	2	"	1	"		90
520.	"	"	3	"	¾	"		90
521.	"	"	3	"	1	"		1 25

522. Rubber case and frame, 1 double convex lens, ½ inch diameter, of high power at one end, and 1 double convex lens, ⅞ inch diameter, of medium power at the other end, ... 1 25

523. Combination of Three Lenses, mounted in tortoise-shell, for the pocket, with ring for attaching to watch-guard, ... 4 50



525. 529. 526.

525. Watchmaker's Glass, hard rubber frame, 1 double convex lens, ⅜ inch to ¼ inch diameter, various powers, ... $0 50

526. Watchmaker's Glass, hard rubber frame, 2 double convex lenses, ¾ inch diameter, very high power, ... 1 00

527. Engraver's Glass, horn frame, 1 double convex lens, ¾ to 1 inch diameter, 40

528. Engraver's Glass, horn frame, 2 plano-convex lenses, 1 inch diameter, . 1 00

529. Engraver's Glass, hard rubber frame, 2 plano-convex lenses, 1½ inches diameter, ... 1 50

PORTABLE ACHROMATIC HAND TELESCOPES.



No. 540. 542. 544. 548. 555. PRICE.

540. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having three draws, and being about 15 inches long when drawn out, and 6 inches long when closed. Object-glass, 1 inch diameter; magnifying power, 15 times, ... $2 50

541. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having three draws, and being about 16 inches long when drawn out, and 6 inches long when closed. Object-glass, 1⅛ inch diameter; magnifying power, 20 times, ... 3 50

542. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having three draws, and being about 23 inches long when drawn out, and 8 inches long when closed. Object-glass, 1⅜ inches diameter; magnifying power, 25 times, ... 5 00

543. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having three draws, and being about 30 inches long when drawn out, and 10 inches long when closed. Object-glass, 1⅝ inches diameter; magnifying power, 30 times, ... 7 50

544. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having four draws, and being about 37 inches long when drawn out, and 11 inches long when closed. Object-glass, 1⅞ inches diameter; magnifying power, 35 times, ... 12 50

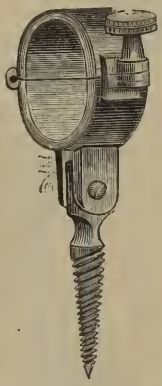
545. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having four draws and Sun-shade, and being about 42 inches long when drawn out, and 11½ inches when closed. Object-glass, 2⅛ inches diameter; magnifying power, 40 times, ... 20 00

546. ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having four draws and Sun-shade, and being about 48 inches long when drawn out, and 13½ inches long when closed. Object-glass, 2⅜ inches diameter; magnifying power, 50 times, ... 30 00

No.		Price.
547.	ACHROMATIC TELESCOPE, with Brass body, covered with Morocco Leather, having five draws and Sun-shade, and being about 53 inches long when drawn out and 13 inches long when closed. Object-glasses $2\frac{5}{8}$ inches in diameter; magnifying power 70 times,	$40 00
548.	ACHROMATIC MARINE TELESCOPE, with Brass body, covered with Morocco Leather, having one draw, and being about 28 inches long when drawn out and 16 inches long when closed. Object-glass $1\frac{1}{2}$ inches in diameter: magnifying power 35 times,	10 00



557.



560.

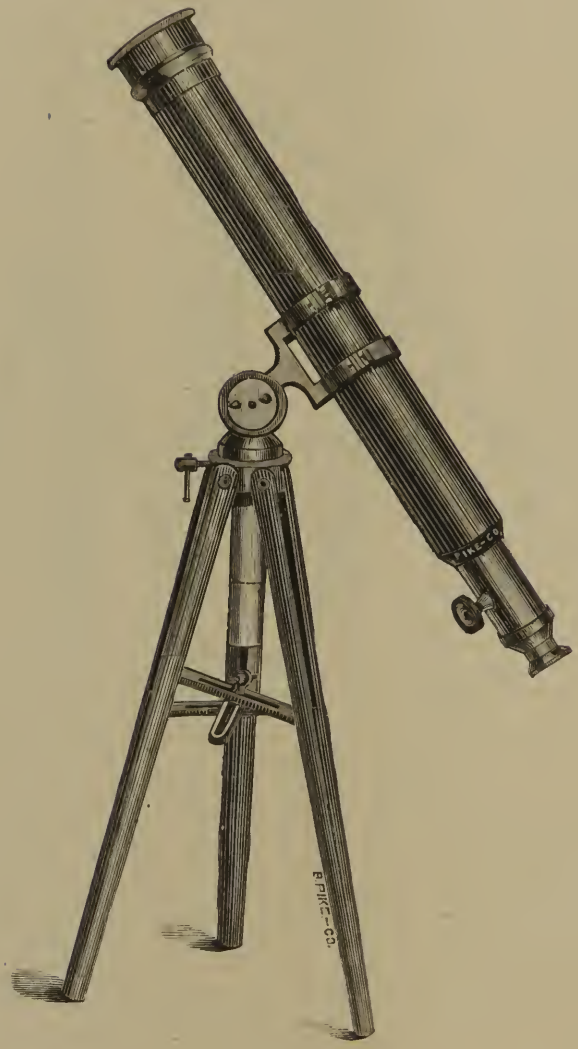
558.

STANDS FOR TELESCOPES.

555.	WOODEN TRIPOD STAND of light weight, well made, with vertical and horizontal movements,	$5 00
556.	WOODEN TRIPOD STAND of larger and heavier construction, having vertical and horizontal movements,	8 00
557.	WOODEN TRIPOD STAND, with Metal Supports for Telescope, and fittings for giving vertical and horizontal movements. This is a *very firm and substantial stand*, and will support an instrument of large size and considerable weight with great steadiness,	15 00
558.	CREEDMOOR TELESCOPE STAND, the legs of which fold together very compactly, making a very portable instrument and one that is very popular.	10 00

ADJUSTABLE CLAMPS FOR HOLDING TELESCOPES.

560.	Brass Adjustable Clamp, to fit Telescope No. 542,	2 00
561.	" " " " " No. 543,	2 75
562.	" " " " " No. 544,	3 25
563.	" " " " " No. 545,	3 75
564.	" " " " " No. 546,	4 25
565.	" " " " " No. 547,	5 00



575.

FINE TELESCOPES ON STANDS,

FOR LANDSCAPE AND ASTRONOMICAL PURPOSES.

(MICROSCOPE AND TELESCOPE LENSES, PAGE 64.)

No.		Price.
570.	LANDSCAPE TELESCOPE, with Object-glass $2\frac{3}{16}$ inches in diameter; body 35 inches long, covered with Morocco Leather, with Brass Mountings and Sun-shade; Rack adjustment to Eyepiece, magnifying 50 diameters. Mounted on a firm, well made and handsomely finished Walnut Stand, with vertical and horizontal movements, ...	$40 00
571.	LANDSCAPE TELESCOPE, with Object-glass $2\frac{3}{8}$ inches in diameter; body 40 inches long, covered with Morocco Leather, with Brass Mountings and Sun-shade; Rack adjustment to Eyepiece, magnifying 60 diameters. Mounted on a firm, well made and handsomely finished Walnut Stand, with vertical and horizontal movements, ...	50 00
572.	LANDSCAPE, or ASTRONOMICAL TELESCOPE, with Object-glass of the *finest* quality, $2\frac{5}{8}$ inches in diameter; body 39 inches long, covered with Morocco Leather, with Brass Mountings and Sun-shade. One Terrestrial Eyepiece magnifying 60 diameters, and one Celestial Eyepiece, with Sun-glass, magnifying 100 diameters, and Rack adjustment for focusing. Mounted on a firm, substantial Walnut Stand, with metal supports and bearings for giving vertical and horizontal movements, ...	85 00
573.	LANDSCAPE, or ASTRONOMICAL TELESCOPE, with Object-glass of the *finest* quality, about 3 inches in diameter; body 47 inches long, covered with Morocco Leather, with Brass Mountings and Sun-shade. One Terrestrial Eyepiece magnifying 65 diameters, and one Celestial Eyepiece, with Sun-glass, magnifying 125 diameters, and Rack adjustment for focusing. Mounted on a firm, substantial Walnut Stand, with metal supports and bearings for giving vertical and horizontal movements.	100 00
574.	LANDSCAPE, or ASTRONOMICAL TELESCOPE, with Object-glass of the *finest* quality, $3\frac{3}{16}$ inches in diameter; body 54 inches long, covered with Morocco Leather, with Brass Mountings and Sun-shade. One Terrestrial Eyepicce magnifying 70 diameters, and two Celestial Eyepieccs, with Sun-glasses, magnifying 100 and 150 diameters, and Rack adjustment for focusing. Mounted on a firm, substantial Walnut Stand, with metal supports and bearings for giving vertical and horizontal movements, ...	140 00
575.	ASTRONOMICAL TELESCOPE, WITH FINDER, with Object-glass of the *finest* quality, about $3\frac{1}{4}$ inches in diameter; body about 54 inches long, made entirely of Brass, highly finished, and having a well corrected Finder at the side. One Terrestrial Eyepiece magnifying 60 diameters; three Celestial Eyepieces and Sun-glasses magnifying respectively 75, 100, 150 diameters, and Rack adjustment for focusing. Mounted on our new and *improved*, first class Stand, with Walnut legs, and highly finished brass supports and bearings for giving vertical and horizontal movements, ...	175 00
576.	ASTRONOMICAL TELESCOPE, WITH FINDER, with Object-glass of the *finest* quality, 4 inches in diameter, 60 inches focal length; body made entirely of Brass, highly finished, and having a well corrected Finder at the side, with adjusting screws and cross hairs. One Terrestrial Eyepiece magnifying about 75 diameters; 3 Celestial Eyepieces and Sun-glasses, magnifying respectivcly 100, 150, 200 diameters; and Rack adjustment, for focusing. Mounted on our new and improved first-class Stand, with Walnut legs, and highly finished brass supports and bearings for giving vertical and horizontal movements, ...	225 00
577.	ASTRONOMICAL TELESCOPE, WITH FINDER, with Object-glass of the finest quality, $4\frac{1}{2}$ inches in diameter, 72 inches focal length; body made entirely of Brass, highly finished, and having a well corrected Finder at the side, with adjusting screws and cross hairs. One Terrestrial Eyepiece magnifying about 80 diameters; 4 Celestial Eyepieces and Sun-glasses, magnifying respectively 100, 150, 200, 250 diameters; diagonal Eyepiece and Rack adjustment, for focusing. Mounted on our new and improved first-class Stand, with Walnut legs and highly finished brass supports and bearings, for giving vertical and horizontal movements, ...	325 00



581.

ASTRONOMICAL TELESCOPES,

MOUNTED ON EQUATORIAL STANDS.

(MICROSCOPE AND TELESCOPE LENSES, PAGE 64.)

Our Astronomical Telescopes, Equatorially Mounted, which are described below, are instruments of *rare excellence.*

We have given special attention to the production and perfection of Telescopes of this class, and can say with confidence that, for the purposes intended, they are *superior* to instruments of foreign manufacture costing twice as much.

The Achromatic Object-glasses of these Telescopes (upon the accuracy of which the value of the instruments depend), are made of the finest quality of Crown and Flint Glass, selected with great care in regard to its specific gravity, and ground to that perfection, in regard to its correction for spherical and chromatic aberration, as only the *highest skill* in this art has attained in modern times.

No.		Price.
580.	FIRST-CLASS ASTRONOMICAL TELESCOPE, with Object-glass 3¼ inches in diameter, and about 4½ feet Focal length; fitted in a highly finished Brass tube, with adjustable Finder at the side, having cross hairs; Rack adjustment for focusing. One Terrestrial Eyepiece, magnifying 60 diameters, and 3 Celestial Eyepieces, with Sun-glasses, magnifying respectively 75, 100 and 150 diameters. Mounted on improved Equatorial Stand, having Declination Circle, with 2 Verniers reading to 3 minutes. Latitude Circle divided into single degrees; and Hour Circle, with Vernier reading to 30 seconds, .	$200 00
581.	FIRST-CLASS ASTRONOMICAL TELESCOPE, with Object-glass 4 inches in diameter, and about 5 feet Focal length; fitted in a highly finished Brass tube, with adjustable Finder at the side, having cross hairs; Rack adjustment for focusing. One Terrestrial Eyepiece, magnifying 75 diameters, and 3 Celestial Eyepieces, with Sun-glasses, magnifying respectively 100, 150 and 200 diameters. Mounted on improved Equatorial Stand, having 7 inch Declination Circle, with 2 Verniers reading to 3 minutes. Latitude Circle divided into single degrees, and Hour Circle, with Vernier reading to 30 seconds, ...	250 00
582.	FIRST-CLASS ASTRONOMICAL TELESCOPE, with Object-glass 4½ inches in diameter, and about 6 feet Focal length; fitted in a highly finished brass tube, with adjustable Finder at the side, having cross hairs; Rack adjustment for focusing. One Terrestrial Eyepiece, magnifying 80 diameters; 1 Diagonal Eyepiece and 4 Celestial Eyepieces, with Sun-glasses, magnifying respectively 100, 150, 200 and 250 diameters. Mounted on improved Equatorial Stand, having 7 inch Declination Circle, with 2 Verniers reading to 3 minutes. Latitude Circle divided into single degrees, and Hour Circle, with Vernier reading to 30 seconds, ...	350 00
583.	FIRST-CLASS ASTRONOMICAL TELESCOPE, with Object-glass 5 inches in diameter, and about 7 feet Focal length, and having the same Mountings, Adjustments, Eyepieces, etc., as No. 582, ...	500 00
584.	FIRST-CLASS ASTRONOMICAL TELESCOPE, with Object-glass 6 inches in diameter, and about 8 feet Focal length, having the same Mountings, Adjustments, Eyepieces, etc., as No. 582, ...	600 00

EYEPIECES FOR TELESCOPES.

No.		Price.
590.	Celestial Eyepieces of any power, with Sun-glass, each,	$6 00
591.	Terrestrial " "	7 50
592.	Diagonal or Prismatic Eyepiece, "	12 00
593.	Solar Prismatic Eyepiece, "	20 00
594.	Sun-Glass, set in Brass Cap, "	1 50

ACHROMATIC OBJECT-GLASSES FOR TELESCOPES.

600.	Achromatic Object-Glass, 1½ inches diameter, 18 to 30 inches focus,	2 00
601.	" " 1¾ " " 18 to 30 " "	3 50
602.	" " 2 " " 18 to 30 " "	4 00
603.	" " extra fine finish, 2 in. diam., 36 in. focus,	6 00
604.	" " " " 2½ " 44 "	10 00
605.	" " " " 3 " 48 "	25 00
606.	" " " " 3½ " 54 "	50 00

ACHROMATIC OBJECT-GLASSES OF THE FINEST QUALITY.

615.	Achromatic Object-Glass, 3 inches in diameter, 45 inches focal length,	50 00
616.	" " 3½ " " 50 " "	75 00
617.	" " 4 " " 60 " "	100 00
618.	" " 4½ " " 72 " "	140 00
619.	" " 5 " " 84 " "	250 00
620.	" " 6 " " 96 " "	400 00
621.	" " 7 " " 108 " "	600 00
622.	" " 8 " " 120 " "	800 00

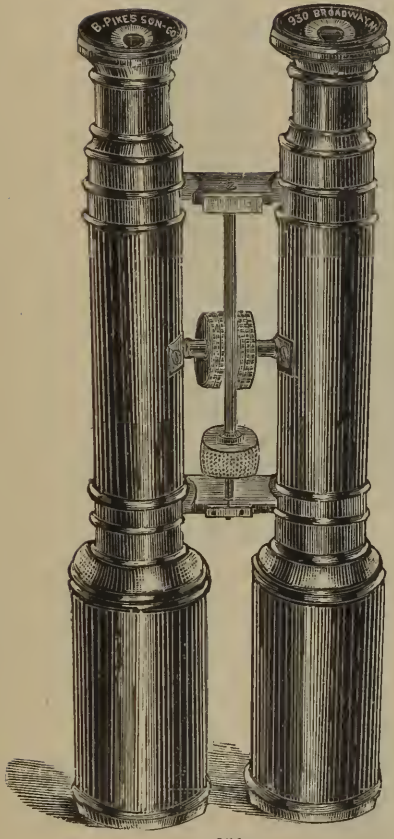
COSMORAMA LENSES.

630.	Double or Plano-Convex Lens, 8 inches diameter, and either 30, 36, 48 or 72 inches focus, each,	4 00
631.	Double or Plano-Convex Lens, 7 inches diameter, same foci as 630, each,	3 00
632.	Double or Plano-Convex Lens, 6 inches diameter, of either 24, 30, 36, 48 or 72 inches focus, each,	2 50
633.	Double or Plano-Convex Lens, 5 inches diameter, of either 18, 20, 24, 30, 36, 48 or 72 inches focus, each,	1 75
634.	Double or Plano-Convex Lens, 4 inches diameter, of either 12, 14, 16, 18, 20, 24, 30, 36, 48 or 72 inches focus, each,	1 25
635.	Double or Plano-Convex Lens, 3 inches diameter, any focus 6 to 36 inches, each,	75
636.	Double or Plano-Convex Lens, 2 inches diameter, any focus 6 to 36 inches, each,	60
637.	Double or Plano-Convex Lens, 1¼ inches diameter, any focus 5 to 48 inches, each,	50

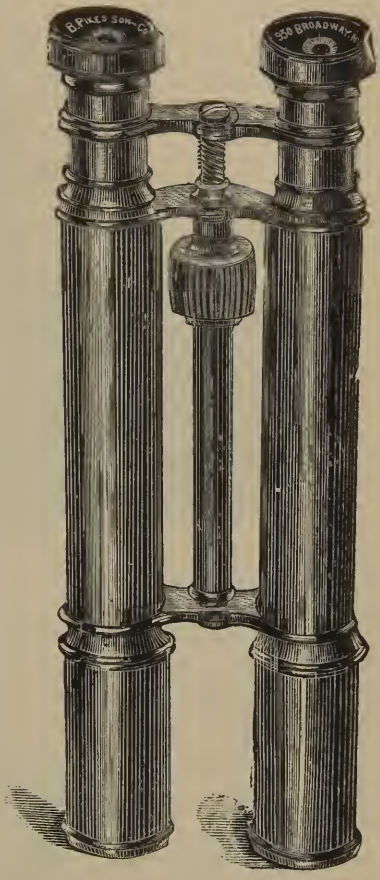
MICROSCOPE AND TELESCOPE LENSES.

638.	Double or Plano-Convex Lens, 1 inch diameter, 2 inches focus,	75
639.	" " " " ¾ " " 1½ " "	75
640.	" " " " ⅝ " " 1¼ " "	75
641.	" " " " ½ " " 1 " "	75

BINOCULAR TELESCOPES.



650.



651.

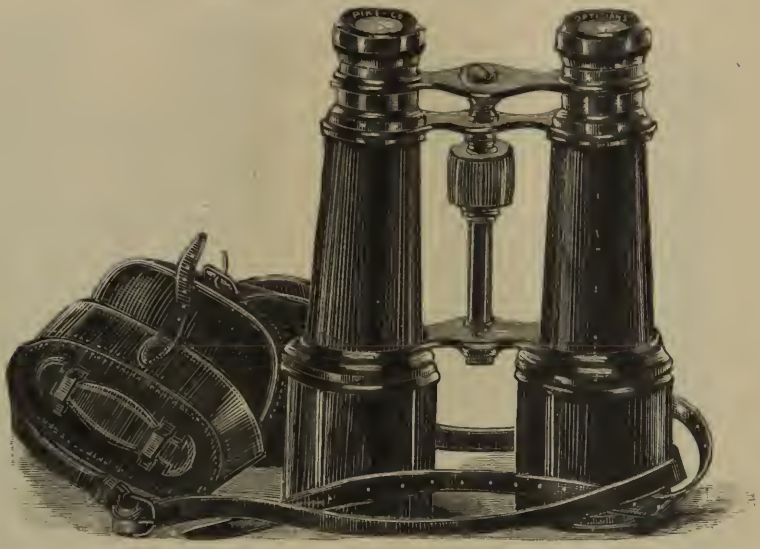
THE BINOCULAR TELESCOPE, OR SIGNAL GLASS, OF EXTRAORDINARY POWER, is the PERFECTION of instruments of this class.

It consists of two telescopes, each of about 12 inches in length, fitted together by a joint, so that when in use the exact distance between the eyes may be obtained. The magnifying power being fully three times as great as that of the ordinary Field Glass, renders it invaluable on prairie ranges, or where distances of many miles are to be covered at a glance.

It is made and finished in the finest manner, the body and Sun-shades being covered with fine Calf-skin, and is furnished with a solid leather case and strap.

No.		PRICE.
650.	BINOCULAR TELESCOPE, with Rack Adjustment for width of eyes, Object-glass $1\frac{5}{16}$ inches diameter, ...	$75 00
651.	BINOCULAR TELESCOPE, with Hinge Adjustment for width of eyes, Object-glass $1\frac{3}{16}$ inches diameter, ...	50 00
652.	BINOCULAR TELESCOPE, 8 inches long, with Hinge Adjustment, without Sun-shades, Object-glass 1 inch diameter, ...	40 00

THE LONG RANGE RECONNOITERING GLASS.



655.

This is a Glass of *very high power* and perfect definition, magnifying twice as much as the ordinary Field Glass.

It is about 7 inches in length, finished in the finest manner, the body and Sun-shades being covered with fine Calf-skin, and has a graduated joint for regulating the distances between the eyes. It is furnished with a solid leather case and strap.

No.		Price.
655.	The Long Range Reconnoitering Glass, ...	$30 00

THREE POWER FIELD GLASSES.



656.

656. These Glasses are very much the same as the regular Field Glasses, with the exception of the Eyepieces, which revolve, carrying *three* pairs of glasses, each of different magnifying power, for *Theatre*, *Field* or *Marine* purposes, as may be required. They are finished in the finest manner, the body and Sun-shades being covered with Morocco Leather, and are furnished with stiff leather cases and straps.

Body,	3½	inches	long,	Object-glass,	17	lines	or	1½	inches	in	diameter,	16 00
"	4½	"	"	"	19	"	"	1 1/16	"	"	"	18 00
"	5	"	"	"	21	"	"	1⅞	"	"	"	20 00
"	5½	"	"	"	24	"	"	2⅛	"	"	"	22 00
"	6	"	"	"	26	"	"	2 5/16	"	"	"	25 00

FIELD AND MARINE GLASSES.



657.

No. PRICE.

657. U. S. SIGNAL SERVICE FIELD OR MARINE GLASS, of *excellent quality*, with *Achromatic* lenses, the body and Sun-shades being covered with Morocco Leather, and having a strong leather sling case, with strap.

Body	$4\frac{3}{4}$	inches long;	Object-glass	19	lines, or	$1\frac{11}{16}$	inches	in diameter,	$8 00
"	5	"	"	21	"	$1\frac{7}{8}$	"	"	10 00
"	$5\frac{3}{4}$	"	"	24	"	$2\frac{1}{8}$	"	"	11 00
"	$6\frac{1}{2}$	"	"	26	"	$2\frac{5}{16}$	"	"	12 00

658. U. S. SIGNAL SERVICE FIELD OR MARINE GLASS, of *superior* quality, with *Achromatic* lenses, the body and Sun-shades being covered with Morocco Leather, and having a strong leather sling case, with strap.

Body	$5\frac{1}{2}$	inches long;	Object-glass	21	lines, or	$1\frac{7}{8}$	inches	in diameter,	15 00
"	6	"	"	24	"	$2\frac{1}{8}$	"	"	17 00
"	$6\frac{1}{2}$	"	"	26	"	$2\frac{5}{16}$	"	"	18 00

659. U. S. SIGNAL SERVICE FIELD OR MARINE GLASS, of the *very finest* quality, with *Achromatic* lenses, the body and Sun-shades being covered with Morocco Leather, and having a strong leather sling case, with strap.

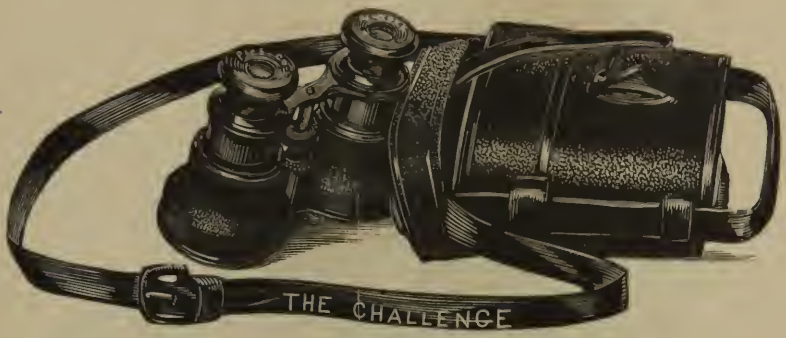
Body	$5\frac{1}{2}$	inches long;	Object-glass	21	lines, or	$1\frac{7}{8}$	inches	in diameter,	21 00
"	6	"	"	24	"	$2\frac{1}{8}$	"	"	23 00
"	$6\frac{1}{2}$	"	"	26	"	$2\frac{5}{16}$	"	"	26 00

ALUMINIUM FIELD OR MARINE GLASSES.

660. FIELD OR MARINE GLASS, the mountings being made of Aluminium, which makes it of exceeding *light weight*, the body and Sun-shades covered with fine Calf-skin, in solid leather sling case, with strap.

Body	$4\frac{1}{4}$	inches long;	Object-glass	21	lines, or	$1\frac{7}{8}$	inches	in diameter,	35 00
"	$4\frac{1}{2}$	"	"	24	"	$2\frac{1}{8}$	"	"	40 00
"	5	"	"	26	"	$2\frac{5}{16}$	"	"	45 00

THE CHALLENGE RACE GLASS.



661.

This is a special Glass of *extraordinary* power, for use in the Field, Theatre, or on the Racecourse; *small* enough to carry in the pocket, being the size of an Opera Glass, but having the power of a large Field Glass, *twice* the number of lenses than ordinary being used in its construction. It is finished in the finest manner, the body being covered with Calf-skin, and is furnished with either, a strong leather sling case, with strap, or with a soft leather case for the pocket, as may be desired. Those in doubt as to which glass to decide on, will do well to order this one, as it cannot fail to give *entire satisfaction.*

No.		Price.
661.	The Challenge Race Glass, in case, ...	$20 00

ALUMINIUM OPERA GLASSES.



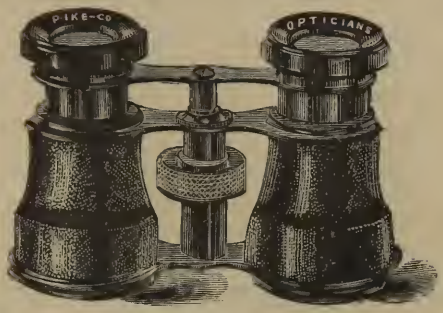
662.

Opera Glasses having their mountings made of Aluminium are so *exceedingly light* in weight, that they can be held to the eyes for any length of time without the least fatigue.

662. Opera Glass, having fine *Achromatic* lenses, the mountings being of *Aluminium*, covered with Morocco Leather, and having a soft leather case.

Body 2 1/8 inches long;	Object-glass 13 lines, or	1 3/16	inches in diameter,	$15 00
" 2 3/8 " "	" 15 "	1 5/16	" "	18 00
" 2 5/8 " "	" 17 "	1 1/2	" "	22 00
" 2 7/8 " "	" 19 "	1 11/16	" "	25 00

OPERA GLASSES.



663.

No. PRICE.

663. OPERA GLASS, of *excellent quality*, with *Achromatic* lenses, the mountings being black, and the body covered with black Morocco Leather, and having a soft leather case.

Body, 2¼ inches long;	Object-glass,	13	lines, or	1 3/16	inches in diameter,	$3	50
" 2½ " " "		15	"	1 5/16	" "	4	00
" 3 " " "		17	"	1½	" "	4	50
" 3¼ " " "		19	"	1 11/16	" "	5	00

664. OPERA GLASS, of *superior quality*, with *Achromatic* lenses, the mountings being black, and the body covered with black Morocco Leather, and having a soft leather case.

Body, 2 inches long;	Object-glass,	13	lines, or	1 3/16	inches in diameter,	6	50
" 2½ " " "		15	"	1 5/16	" "	7	00
" 2¾ " " "		17	"	1½	" "	8	00
" 3 " " "		19	"	1 11/16	" "	9	00

OPERA GLASSES OF EXTRA QUALITY.



665.

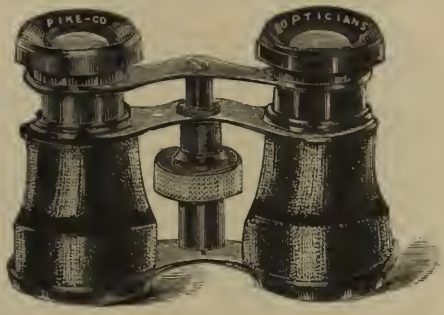
665. OPERA GLASS, of the *finest quality*, finished in the most perfect manner, with *Achromatic* lenses, the mountings being black, and the body covered with Morocco Leather, and having a fine soft leather case.

Body, 2 inches long;	Object-glass,	13	lines, or	1 3/16	inches in diameter,	$8	00
" 2½ " " "		15	"	1 5/16	" "	8	50
" 2¾ " " "		17	"	1½	" "	9	50
" 3 " " "		19	"	1 11/16	" "	11	00

666. OPERA GLASS, of the *finest quality*, finished in the most perfect manner, having *twelve lenses*, which render its correction for color most perfect, the mountings being black, and the body covered with fine Morocco Leather, in soft case.

Body, 2 inches long;	Object-glass,	13	lines, or	1 3/16	inches in diameter,	13	00
" 2½ " " "		15	"	1 5/16	" "	14	00
" 2¾ " " "		17	"	1½	" "	16	00
" 3 " " "		19	"	1 11/16	" "	18	00

OPERA GLASSES OF SUPERIOR QUALITY.



667.

No. PRICE.

667. OPERA GLASS, of *superior quality*, with *Achromatic* lenses, the mountings being black, with gilt trimmings, and the body covered with fine Calf-skin, making a neat and elegant glass, and having a soft leather case.

Body, 2¼ inches long;	Object-glass,	13	lines, or	1 5/16	inches in diameter,		$8 00
" 2½ "	"	15	"	1 5/16	"	"	9 00
" 2¾ "	"	17	"	1½	"	"	10 00
" 3 "	"	19	"	1 11/16	"	"	11 00

668. OPERA GLASS, of *superior quality*, with *Achromatic* lenses, the mountings being nickel, and the body covered with fine Calf-skin, and having a soft leather case.

Body, 2¼ inches long;	Object-glass,	13	lines, or	1 3/16	inches in diameter,		8 00
" 2½ "	"	15	"	1 5/16	"	"	9 00
" 2¾ "	"	17	"	1½	"	"	10 00
" 3 "	"	19	"	1 11/16	"	"	11 00

PEARL OPERA GLASSES OF SUPERIOR QUALITY.



669.

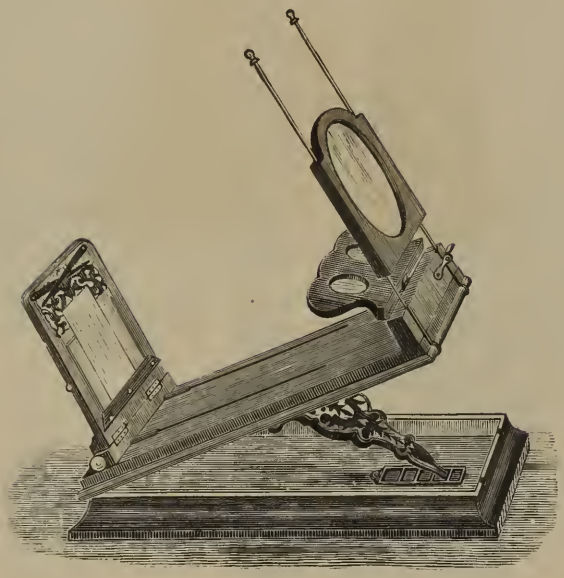
669. OPERA GLASS, of *superior quality*, with *Achromatic* lenses, the mountings being of metal richly *gilt*, and the tops and bodies of the purest *white pearl*, and having a fine soft leather case.

Body, 1¾ inches long;	Object-glass,	11	lines, or	1	inches in diameter,		10 00
" 1⅞ "	"	13	"	1 3/16	"		12 00
" 2⅛ "	"	15	"	1 5/16	"		13 00
" 2⅜ "	"	17	"	1½	"		15 00
" 2⅝ "	"	19	"	1 11/16	"		17 00

670. OPERA GLASS, of *superior quality*, with *Achromatic* lenses, the mountings being of metal richly *gilt*, and the tops and bodies of elegant pearl of varied colors—*oriental*. This is the *richest* and *choicest* glass for the price that has ever been produced.

Body, 1¾ inches long;	Object-glass,	11	lines, or	1	inches in diameter,		12 00
" 1⅞ "	"	13	"	1 3/16	"		13 00
" 2⅛ "	"	15	"	1 5/16	"		15 00
" 2⅜ "	"	17	"	1½	"		17 00
" 2⅝ "	"	19	"	1 11/16	"		20 00

GRAPHOSCOPES.



682.

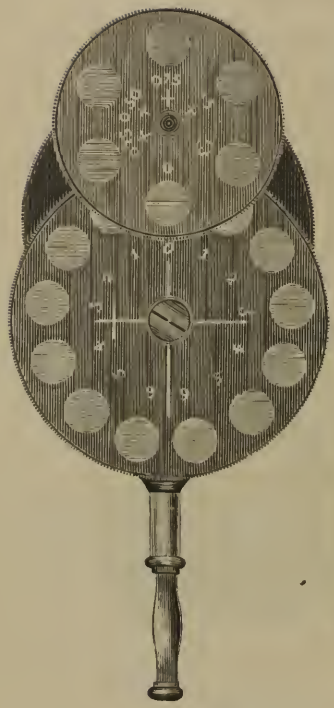
The GRAPHOSCOPE has become one of the most *popular* instruments of its kind that has ever been produced. It combines facilities for magnifying pictures of any size or kind, and can readily be adjusted to any vision, raised or lowered, or folded into a convenient form for transportation.

The Graphoscopes, which we manufacture and offer for sale are made of *rosewood* or *walnut*, polished and finished in such an elegant manner as to make them a desirable article for the drawing-room or library.

The LARGE LENS for pictures, and the smaller pair of STEREOSCOPE LENSES for stereoscopic views, are made of the best *crown* glass, combining the highest magnifying power with the greatest brilliancy.

No.		PRICE.
680.	Rosewood Graphoscope, with large lens 3½ inches in diameter, . . .	$6 00
681.	" " " 5 " . . .	10 00
682.	" " elegantly finished, with large lens, 5 inches in diameter,	20 00
683.	" " " " " 6 "	25 00
684.	" " " " " 7 "	30 00

OPHTHALMOSCOPES.



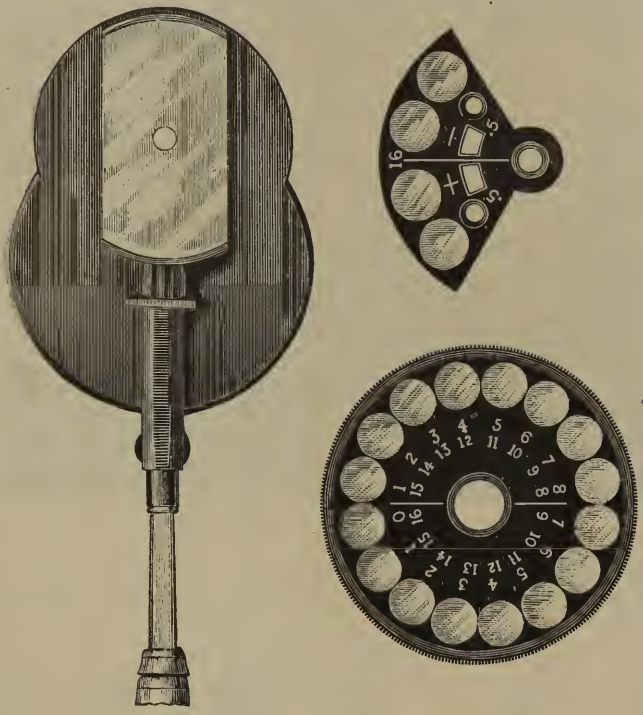
694.



690.

No.		Price.
690.	LORING'S OPHTHALMOSCOPE, with mirror 1¼ inches in diameter, and revolving disk at back, containing 12 lenses, six each convex and concave, of 3, 5, 8, 12, 18, 36 inches focus; double convex condensing lens 1½ inches in diameter, in hard rubber frame; in Morocco snap case, ...	$14 00
691.	LORING'S OPHTHALMOSCOPE, similar in form and size to No. 690, with one mirror and one condensing lens, and a series of ten convex and eleven concave lenses of the Dioptric System, set in a revolving disk, covered with metal to preserve them from dust, ...	17 50
692.	LORING'S OPHTHALMOSCOPE, similar in size and form to the preceding, but with two mirrors, two condensing lenses of 2¼ and 3 inches focus, and three revolving disks containing a series of twenty-three lenses, convex and concave, from 2 to 60 inches focus, of the Inch System, ...	20 00
693.	LORING'S OPHTHALMOSCOPE, the same as 692, with the addition of a rectangular mirror, swung on two pivots, to tilt both ways to angles of 20° or 25°, which can be readily substituted for the ordinary circular mirror; in snap Morocco case, ...	25 00
694.	DR. BADAL'S OPHTHALMOSCOPE, with two mirrors 1¼ inches in diameter, two revolving disks at back of mirror, one containing lenses Nos. 1, 2, 3, 4, 5, 6, both convex and concave; the other lenses 0.25, 0.50, 0.75 and 13 convex and 13 concave, all of the Dioptric System, the disks arranged to be used in combination, with a double convex condensing lens in frame; all contained in a neat Morocco case for the pocket, ...	16 00

LORING'S NEW IMPROVED OPHTHALMOSCOPE.



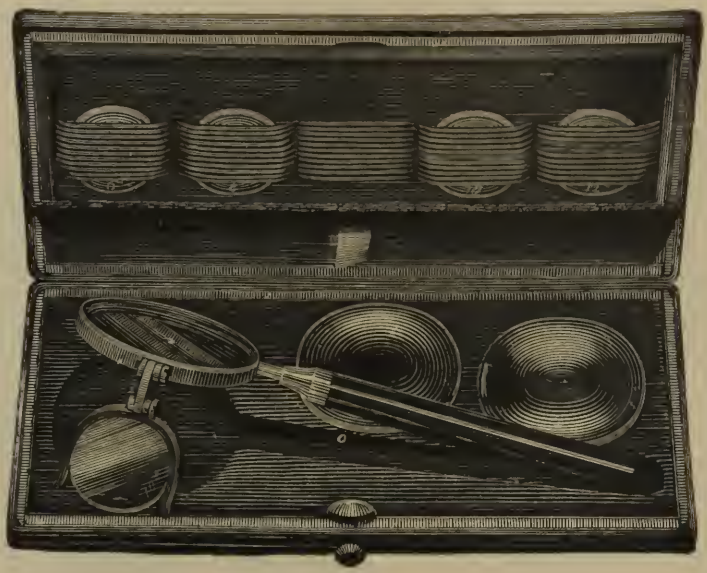
695.

No.		Price.
695.	LORING'S NEW OPHTHALMOSCOPE, in Morocco case, ...	$35 00

This instrument consists of a disk, and a quadrant of a disk carrying the lenses.

The single disk contains sixteen glasses on the metric system, the plus being numbered in white, and the minus in red. The first row of numbers, or that just beneath the glass, shows the real value of the glass; the second or inner row shows the result of the combinations when the quadrant is in position. The quadrant rotates immediately over the disk and around the same center, and contains four glasses, —5—16, and +5+16. When it is not used the quadrant is beneath its cover. The instrument then represents a simple Ophthalmoscope with sixteen perforations, the series running with an interval of I D, and extending from I to 7 plus, and from I to 8 minus. This is ample for all ordinary work, as the interval of I D is as close as even an expert usually desires, and can, with a little experience, be used for even very minute discrepancies. For if in a given case the fundus is seen distinctly with I D and a little to spare, while 2 D blurs the picture, we know at once that the refraction must be between the two, or I 5 D. If, however, for any reason we wish to prove this conclusion, we can bring up 0 5 D. From this glass we get successive half-dioptric from I to 8 plus, and from I to 9 minus. In this way we have, so to speak, a fine and coarse adjustment, as in the microscope. If the higher numbers are desired, these are obtained by combinations with those of the quadrant. These progress regularly up to 16 D, every dioptric being marked upon the disk; above this, up to +23 D and —24 D, we have simply to add the glass which comes beneath the 16 D, turning always in the same direction.

The mirror shown in the drawing is the "tilting" form. If preferred, the common circular mirror can be employed.



696.

No.		Price.
696.	Liebreich's Ophthalmoscope, with two convex condensing lenses, and a series of five lenses of different foci, fitted to an arm behind the perforated mirror; in Morocco case,	$5 00

DEMONSTRATION LENSES.



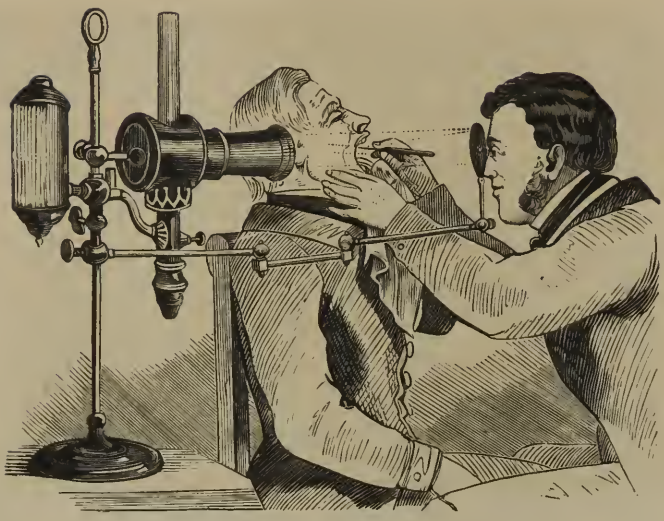
700, 701.

700.	Set of Six Demonstration Lenses, 1¾ inches in diameter, including Plane, Double Convex, Plano-Convex, Double Concave, Plano-Concave and Meniscus Lenses,	2 50
701.	Large Set of Six Demonstration Lenses, about 2½ inches in diameter,	7 50

MAGNIFYING AND DIMINISHING MIRRORS.

702.	Magnifying Mirror, 6 inches diameter, in black wooden frame,	2 00
703.	Diminishing " 6 " " " " "	2 50
704.	Magnifying and Diminishing Mirrors in *one*, black wooden frame,	4 50
705.	Mirrors in mahogany frame, one side magnifying, the other plane, 5 inches in diameter, a *finer* article,	2 50
706.	Mirrors in mahogany frames, same as No. 705, 5½ inches in diameter,	3 00
707.	" " " " No. 705, 6 " "	3 50
708.	" " " " No. 705, Magnifying and Diminishing, in one frame,	5 00

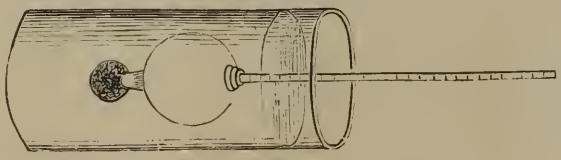
LARYNGOSCOPES.



709.

No.		Price.
709.	Tobold's large Laryngoscope without Lamp, with two Laryngeal Mirrors, complete in a case, ...	$22 00

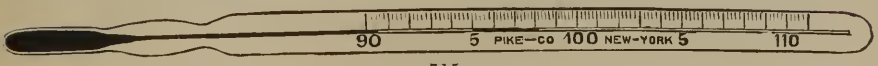
URINOMETERS.



711.

710.	Urinometer in case, for the pocket, ...	1 00
711.	" " " " with graduated jar, ...	2 00
712.	" " " " " " " and thermometer, .	4 00

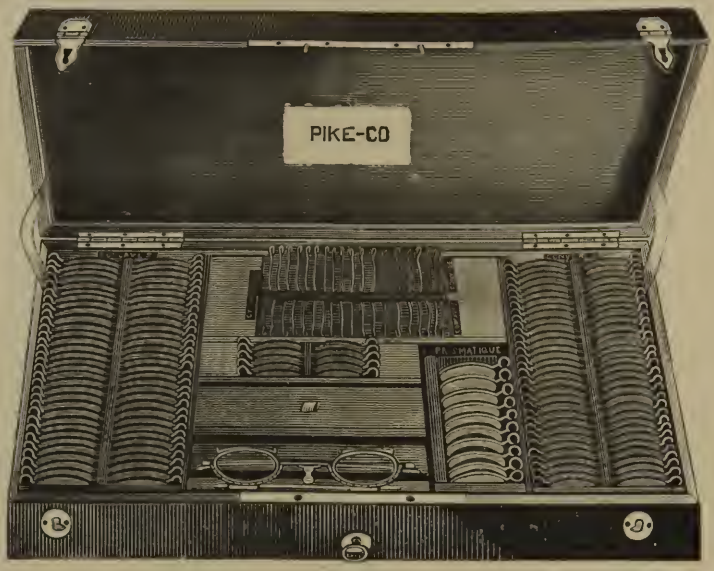
CLINICAL THERMOMETERS (SELF-REGISTERING).



715.

715.	Clinical Thermometers, 3, 3½, 4, 5, 6 inches long, in hard rubber cases, each .	$2 00
716.	English Clinical Thermometers, 3, 3½, 4, 5, 6 inches long, in boxwood cases, .	3 00
717.	" " " with indestructible indexes, 3 to 6 inches long, in German silver cases, ...	3 50
718.	" " " with indestructible indexes, 3 to 6 inches long, in coin silver cases, ...	5 00

SETS OF TRIAL LENSES.



725.

No. PRICE.

725. NACHET'S COMPLETE SET OF TRIAL LENSES contains 32 pairs convex lenses, 32 pairs concave lenses, from 2 to 72 inches focus; 19 plano-cylindrical convex lenses, 19 plano-cylindrical concave lenses, from 6 to 60 inches focus; 9 prisms, angles from 2 to 10 degrees; 4 plain colored glasses, 1 white glass disk, 1 half ground surface, 2 metal disks with stenopaic slit, 1 metal disk with hole and 1 solid metal disk, graduated trial frame, and 1 not graduated, for holding the various lenses. The whole packed in a Morocco covered case, with lock and key, ... $100 00

726. NACHET'S TRIAL SET OF LENSES, same as No. 725, but with the cylindrical lenses in pairs, ... 125 00

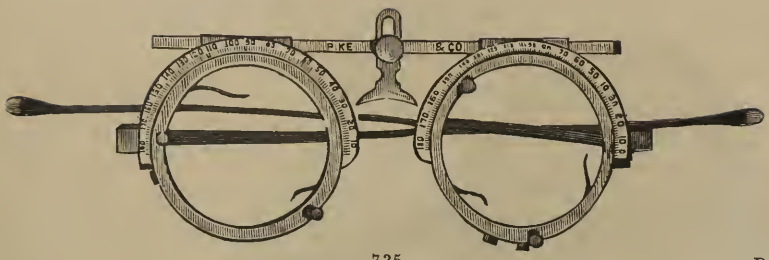
727. NACHET'S TRIAL SET OF LENSES, consisting of 23 pairs spherical convex and 23 pairs spherical concave lenses, from 2 to 72 inches focus; 12 cylindrical convex and 12 cylindrical concave, 8 to 60 inches focus; 6 prisms, 2° to 8°, 2 disks, 1 plane glass, 1 ground glass, all mounted in handsome metallic frames; 3 colored glasses, and a graduated frame for holding the various lenses. The whole packed in a Morocco case, . . 70 00

728. NACHET'S SET OF TRIAL LENSES, same as No. 727, but having the cylindrical lenses in pairs, ... 85 00

729. SERIES OF TRIAL SIGHTS, consisting of 23 pairs spherical convex, and 23 pairs spherical concave lenses, from 2 to 72 inches focus; 12 cylindrical convex and 12 cylindrical concave, 8 to 60 inches focus; 6 prisms, 2° to 8°; 2 disks, 1 plane glass, 1 ground glass, all mounted in handsome metallic frames; 3 colored glasses, and a graduated frame for holding the various lenses. The whole packed in a polished mahogany case, ... 55 00

730. SERIES OF TRIAL SIGHTS, consisting of 23 pairs spherical convex and 23 pairs spherical concave lenses, from 2 to 72 inches focus; 12 cylindrical convex and 12 cylindrical concave, 8 to 16 inches focus; 6 prisms, 2° to 8°; 2 disks, 1 plane glass, 1 ground glass, all *unmounted;* 3 colored glasses, and a graduated frame for holding the various lenses. The whole packed in a polished mahogany case, ... 40 00

The above sets are furnished numbered, either in inches, or according to the dioptric system, as desired.



No. 735. Price.

735. Nachet's Improved Trial Frames, graduated on the outside, for adjusting Cylindrical Glasses, and having superior arrangements for holding spherical glasses, together with adjustable nosepiece and sliding bar for measuring the distance between the eyes, ... $10 00

736. Trial Spectacle Frame, with double cells to each eye, the outer ones graduated to 180°, for reading the astigmatic axis of the eyes. With these frames any desired combination of spherical and cylindric lenses can be given to the patient for trial; per pair, ... 5 00

737. Green's Set of Test Diagrams, for detecting astigmatic eyes. This set consists of a pasteboard dial 12 inches in diameter, divided into 12 parts, as a clock dial. To this a series of 14 diagrams of lines and circles can be attached separately at pleasure, and made to revolve against the face of the dial, ... 5 00

738. Astigmatic Dial. A conicular disk of tin japanned white, and divided on the margin of one side to every five degrees and numbered; over this another, but smaller, disk revolves, having two series of black lines on it which are at right angles, though not crossing one another. The lines are adjusted for 20 feet test of astigmatism (No. 20), Snellen's, . . . 2 50

739. Grafe's Wire Optometer for detecting astigmatism, with tape measure attachment, ... 7 00

740. Dr. Pray's Series of Astigmatic Letters, on stiff card-board for hanging. These letters are made up of black lines and white spaces, the white and black spaces of each letter being all ruled at one angle in each letter, and this angle being varied for every letter. There are 12 letters, and the angles of the lines are horizontal, 15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135°, 150°, 165°, ... 50

741. Snellen's Test Types, bound in paper, ... 2 00

742. Snellen's Test Types, bound, ½ leather, ... 2 75

743. Jaeger's Test Types, Nos. 1 to 14, bound in ½ leather, ... 1 00

744. Snellen's Test Letters, Nos. VIII. to C. on heavy card-board, 15x23 inches. Per card, ... 50

745. Snellen's Test Figures, Nos. VIII. to C. Per card, ... 50

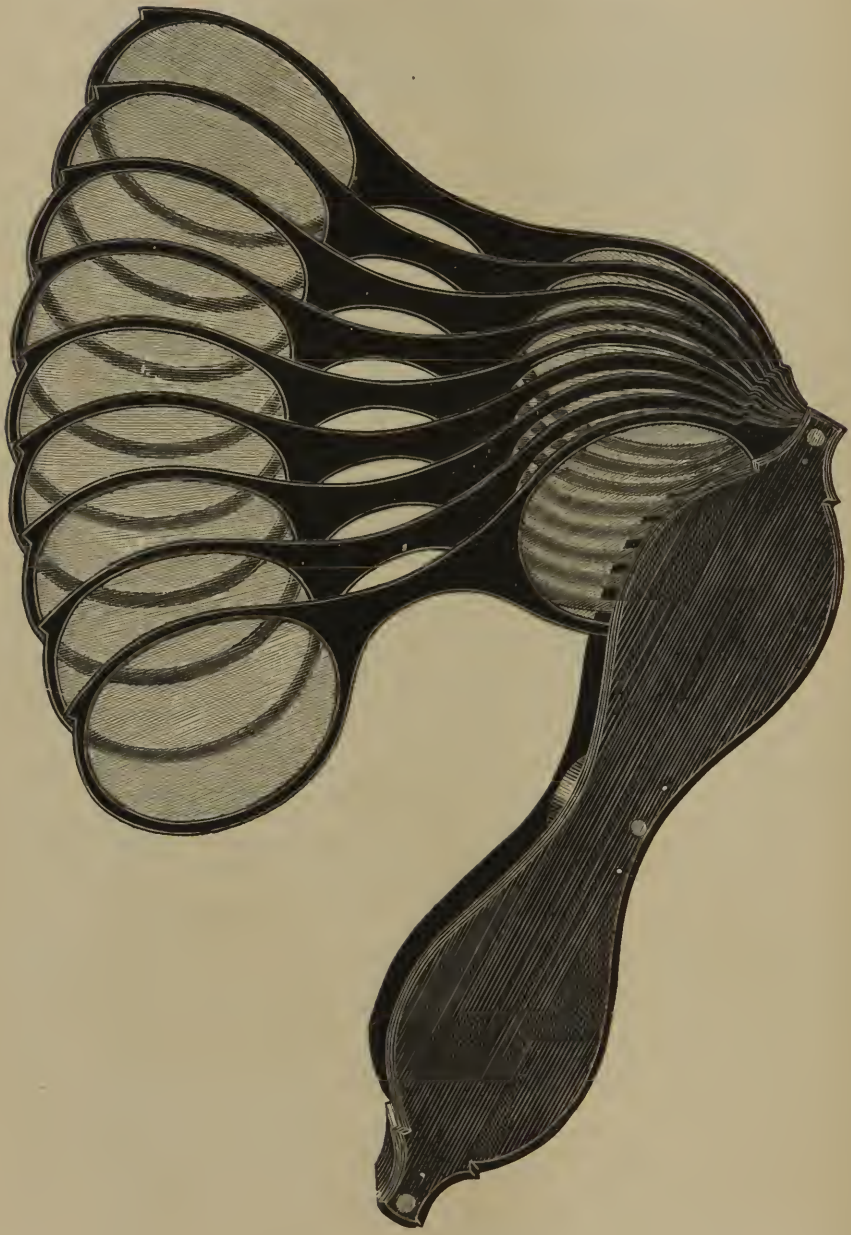
746. Dr. Otto Becker's Set of Four Diagrams for detecting and measuring astigmatism, ... 3 00

747. Dr. Burkhardt's Series of Dots and Lines for determining and measuring degree of Myopia, Hypermetropia, Presbyopia, and Astigmatism. A set of four cards, ... 4 00

748. Dr. Keyser's "Prosopanometer," for measuring the width of face, width and depth of bridge for spectacles, ... 4 00

749. Strabismometer of Ivory, ... 1 50

TRIAL GLASSES IN HARD RUBBER FRAMES.



755, 756.

No.		Price.
755.	Trial Glasses in Hard Rubber Frames, 5 to 48 inches focus, Convex,	$10 00
756.	" " " " 5 to 48 " Concave.	10 00



760.

No.		Price.
760.	Auzoux's Dissected Model of the Eye; the most perfect and accurate ever made. The material is Papier-Maché, and the whole is accurately dissected, so as to be taken apart, showing successively the *Sclerotic* and *Choroid* coats, and *Cornea*, *Retina*, *Iris*, *Pupil*, *Crystalline Lens*, *Aqueous* and *Vitreous Humors*, the *Muscles*, *Nerves* and *Blood-Vessels*, colored as in the natural eye, with full descriptive pamphlet,	$35 00
761.	The same, but of German manufacture,	30 00
762.	Human Eyeball, enlarged size. Can be taken to pieces, and then shows the cornea, iris, crystalline lens, vitreous humor, and the coatings, including the results of microscopic examination upon the retina,	6 50
763.	Map and Diagram of the Eye (22 by 15 inches), handsomely colored, with descriptive letter-press,	1 00
764.	Artificial Human Eyes, of all sizes and colors, each,	10 00

STEREOSCOPES.



770.



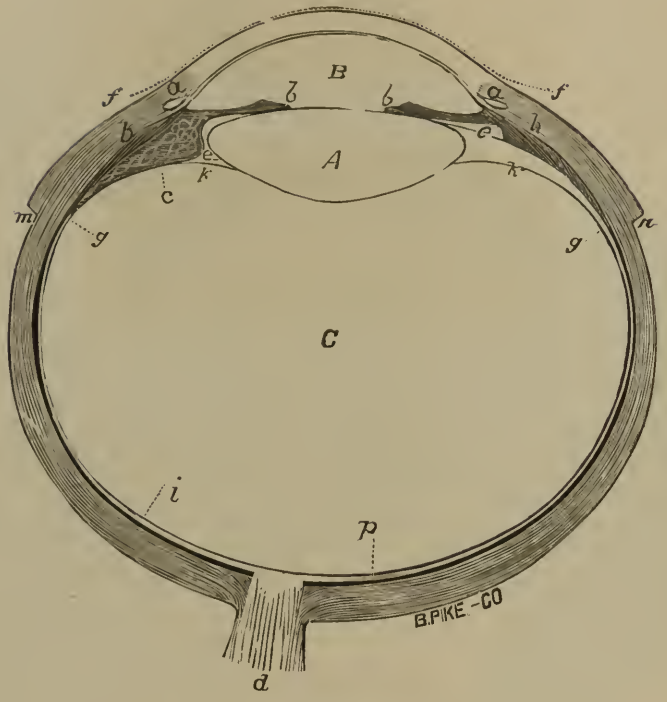
773.



776.

770.	Stereoscope, large glasses, walnut frame and hood,	1 00
771.	" " mahogany or walnut frame and hood, elegantly finished,	2 00
772.	Stereoscope, large glasses, rosewood frame and hood, elegantly finished,	2 50
773.	" " same as No. 770, on Stand,	1 25
774.	" " " No. 771, "	3 00
775.	" " " No. 772, "	3 50
776.	French Achromatic Stereoscope, very fine,	9 00

THE HUMAN EYE.



ANATOMICAL CONSTRUCTION OF THE EYE.

The interior of the Eye is a dark chamber, containing certain almost perfectly *transparent refractive media*, through which all light must pass in order to reach the *Retina*.

This *refractive media* consists of the Cornea (extending from *f* to *f*), the Aqueous Fluid (*B*), between the Cornea and the Crystalline Lens (*A*), and the Vitreous Matter (*C*), occupying the space between the Crystalline Lens and the Retina (*i p*).

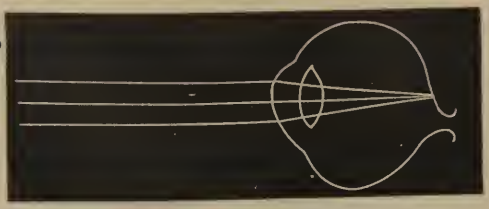
The *Retina* is a nervous expansion of the Optic Nerve (*d*), spreading over the entire back of the Eyeball.

On the Retina of the eye the images of objects looked at are formed, by refraction through the Cornea, Crystalline Lens, etc., and the impressions thus made are transmitted to the *brain* by the Optic Nerve, creating sensations, which make us conscious of the existence of outside objects.

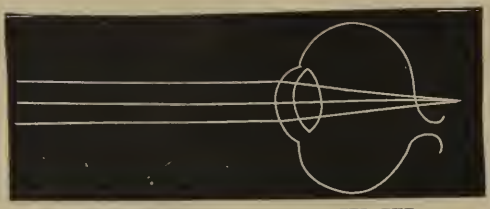
The *Ophthalmoscope* enables us to see the images thus formed on the Retina of the human eye by looking into it through the pupil.

This transparent *refractive media* of the eye may be regarded as a *compound lens*, with curvatures so adjusted that in the *perfectly constructed* eye, the images of objects looked at are formed or focused *clearly* and *sharply* on the sensitive layer of the Retina.

This is the condition of the *Emmetropic*, or perfect eye (see diagram, page 81), and the difference between such eyes and others, giving more or less *imperfection of vision*, is caused simply by the relative distance between the Retina and the refractive media being displaced by the *flattening* or *lengthening* of the eyeball itself, or the imperfection in the *curvature* of the refractive media; for while the human eye as an optical instrument is of the *most perfect design*, it is found *very often* to be of *imperfect construction*.



EMMETROPIC, OR PERFECT EYE.



HYPERMETROPIC, OR FAR-SIGHTED EYE.

FAILING SIGHT.

Daily observations with the Ophthalmoscope prove to us that at no period of life is the *transparency* of the interior of the eye so perfect as in *childhood*, while it *gradually diminishes* with *age;* hence it follows that even if there were no other causes to produce the effect, the acuteness of vision must naturally be greater in youth than it is in after life.

The diminution of the transparency of the interior of the eye progresses with such uniform regularity with advancing years, that practised ophthalmoscopists are able to approximate the age of the patient by the relative *clearness* of this interior matter.

When a person with Emmetropic, or perfect eyes, arrives at the age of about *thirty-five* years, he prefers for reading print a little larger than he would have done *five* or *ten* years previously, and he holds the book a little *farther* from his eyes and seeks a *stronger* light.

The difference, however, is so slight, and the change has been so gradual, that it has *escaped his notice.* At *forty* it becomes *more perceptible*, and he begins to be conscious that he *cannot* see *small* print in a *dim* light quite as well as formerly, but still he gets along very well and suffers but little inconvenience. At *forty-five* he finds he has trouble in reading ordinary print by *artificial* light. In writing he does not keep accurately on the pale ruled lines, but still by *bright* daylight he sees very well, but instinctively *avoids fine print.* In the course of a *few months* he has trouble even in the daytime in seeing fine print, and the effort becomes painful. He is now conscious and *willing to admit* that his eyes are *failing.* We use the words, "willing to admit," because a great many persons take a pride in boasting that they have arrived at middle age and still have undiminished acuteness of vision. They persuade themselves into the belief that their bodily vigor is so great that senile changes *cannot* affect them, and only acknowledge their mistaken views when actually *compelled* to do so by being no longer able to read, write, or do fine work with the *unassisted* eyes.

As a result of this gradual change in the condition of the eyes with advancing years, they become *flatter*, thus shortening the distance between the Crystalline Lens and the Retina, and causing the impression or image of the object looked at to form *behind* the Retina, instead of *clearly* and *sharply* on the same. The eyes have now become Hypermetropic or far-sighted (see diagram above), and for the correction of the same, the use of convex glasses are *absolutely necessary.*

THE NECESSITY OF USING SPECTACLES.

Many persons are prejudiced against the use of glasses, and decline to wear them when their use is *imperatively demanded.*

This is *altogether wrong;* for, in attempting to read *small* print, they strain the muscles of accommodation by requiring them to act *beyond their strength.*

To preserve the *sight unimpaired* the longest possible time, it is requisite, as soon as it begins to fail, to consult a *practical* and *experienced* optician, who will advise and select the *weakest* glasses that will make near vision easy and neutralize the deficieney, thus *artificially* restoring the eyes to their *normal* condition.

The object of using glasses is *not* to magnify the print, but to make it appear *distinct,* and, as nearly as possible, of the *same size* as before the vision was impaired.

THE INJURIOUS EFFECTS OF USING GLASSES TOO STRONG.

As the result of *many years' observation* and *experience,* we find that the majority of people *seriously injure* their eyes by the use of *too strong* glasses at first; this creates the necessity of changing them *soon* and *often,* for those of a *stronger* power.

The habitual use of glasses *too strong* in the commencement of failing vision is the *most powerful factor* in inducing *rapid senile changes* in the Crystalline Lens and muscles of accommodation; the Ciliary muscles are relaxed, and only required to contract to a certain point. They soon become *enfeebled* and *lose the power* to act beyond their accustomed tension. This state of tension soon indicates their *maximum* strength, which cannot long be maintained; hence glasses of higher power *must* be substituted to relieve the strained accommodation.

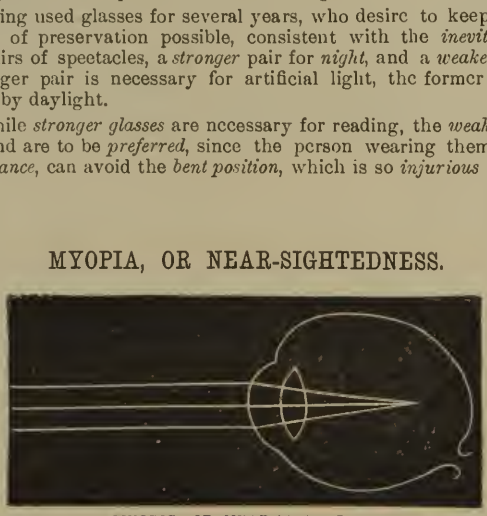
HOW TO USE SPECTACLES JUDICIOUSLY.

In general it should be observed, that it is desirable to increase the strength of the glasses but *slowly;* and in using glasses for the first time, to do so *only* in the *evening,* and to keep those for day use as soon as *stronger* ones are required for the evening, and thus every time that *stronger* glasses are required to continue using the former *weaker* ones by daylight.

All persons having used glasses for several years, who desire to keep their eyes in the most perfect state of preservation possible, consistent with the *inevitable senile changes,* should have *two* pairs of spectacles, a *stronger* pair for *night,* and a *weaker* pair for *day* use; and when a stronger pair is necessary for artificial light, the former *night* glass may be substituted for use by daylight.

Finally, that while *stronger glasses* are necessary for reading, the *weaker* are often sufficient for *writing,* and are to be *preferred,* since the person wearing them, being enabled to see at a *greater distance,* can avoid the *bent position,* which is so *injurious* to the eyes.

MYOPIA, OR NEAR-SIGHTEDNESS.



MYOPIC, OR NEAR-SIGHTED EYE.

Myopia, or near-sightedness, is a condition of the eye exactly the reverse of Hypermetropia, or far-sightedness.

It consists of an abnormal extension or elongation of the eyeball, which places the *Retina* beyond the focus of the Crystalline Lens, thus causing the images of objects looked at to form within the vitreous matter of the interior of the eye, before reaching the Retina, on which, in order to give perfect vision, it should focus *clearly* and *sharply* (see diagram above).

To *artificially* neutralize this deficiency, and thus restore the image to its proper position on the Retina, the use of *concave* glasses is necessary.

Near-sightedness is almost universally regarded as a *hereditary* disease.

The emmetropic, or normal eye, *rarely* becomes near-sighted without a predisposition to it derived from ancestors, but that condition having once occurred, it is often transmitted as a predisposition to posterity, and under fresh exciting causes is developed to its *higher degrees*. Thus the hereditary principle accumulates in the posterity the effects of the causes repeated in every generation.

By means of the Ophthalmoscope it is clearly shown that the near-sighted eye is *diseased*, and that the grade of near-sightedness is proportionate to the degree of extension of the organ caused by morbid anatomical changes.

The question then very naturally arises, can near-sightedness *be cured?* The answer must *unhesitatingly* be in the *negative*.

It is simply *absurd* to suppose that the *dense, firm*, and but slightly elastic fibrous tissues, forming the sclerotic coat of the eye, after softening and extension, can ever be restored to their normal condition, so that the softened and extended fibres will contract, and bring the posterior part of the *sclerotica* back to its original form and thickness. This change *never* takes place.

Formerly near-sightedness was thought to be caused by an *excessive convexity* of the *Cornea*, and *systematic efforts* were made to lessen this by *compression;* but now, since it is universally acknowledged to be dependent upon the giving way of the sclerotic tissues causing a backward elongation of the eyeball, we can readily see that such treatment is not only *useless*, but *injurious*.

Near-sightedness, then, is *incurable*, and only the *mildest* grades are *neutralized* by the compensation of senile changes at an advanced period of life.

As the eye *cannot be restored* to its normal condition, the treatment must consist in endeavoring to arrest the progress of abnormal changes, and at the same time rendering vision easy and comfortable, by neutralizing the deficiency as far as possible by the use of *concave* glasses.

The selection of spectacles for near-sightedness is a matter of *great importance*, on account of the *morbidly distended* condition of the eyeball, and its tendency to get worse. Therefore, it is *very essential*, that only glasses of the *finest quality* should be used in connection with the eyes.

ASTIGMATISM.

Astigmatism is caused by *imperfections* in the *curvatures* of the *Cornea* and *Crystalline Lens* of the eye, creating *disturbances of vision*, whereby the images of objects refracted on the *Retina* appear *distorted* and of *unnatural shapes*, *parts* of them being *sharply seen*, while *other parts are indistinct;* as, for instance, in looking at a series of *horizontal* or *vertical* lines at a distance of twenty feet or so, instead of *each* and *every* line being seen *clearly* and *sharply*, *some* will appear clear, while *others* will be seen *more* or *less indistinctly*.

Eyes *so perfectly constructed* as to be *absolutely free* from all errors of refraction in their optical axes are *never met with*.

Therefore, *astigmatism* may be said to exist, to a *very slight* extent, in *all eyes*; but these deviations in the regularity of the curvatures of the surfaces of the *Cornea* and *Crystalline Lens* are usually *too slight* to disturb the acuteness of vision, but when of *higher* degree the perfection of vision is *seriously impaired*.

In the *higher grades* of astigmatism the use of *cylindrical* glasses for its correction is *very essential*, and a source of *great gratification* and *pleasure* to those, who, for the first time, become aware that their heretofore *distorted* and *imperfect* vision is capable of being *vastly improved* and *benefited* by the use of glasses of the proper curvature.

In eyes exhibiting astigmatism of the higher grades, it is very often discovered upon examination, that not only are *both eyes* astigmatic, but that combined with it, also, is *myopia* or *hypermetropia;* while again this may exist only in *one eye*, while the other may be *emmetropic* or *without defect*.

When the eyes are found upon examination, to be in this condition, it is very necessary and important that *each eye* should be tested *separately*, and glasses of different curvatures furnished for *each*.

DIRECTIONS FOR ORDERING SPECTACLES.

In ordering Spectacles from this Catalogue, it is only necessary to answer the following questions, viz.:

How long have you worn spectacles?

Have those you have worn *ached* or *fatigued* your eyes?

Do you require Spectacles for reading or for seeing at a distance?

Can you read *Test Type No.* 1, on the following page, by *bright daylight*, in holding it about *fourteen* inches from your eyes?

Can you read *Test Type No.* 2, on the following page, by *bright daylight*, in holding it about *fourteen* inches from your eyes?

Can you read *Test Type No.* 3, on the following page, under the same circumstances?

Can you read *Test Type No.* 4, on the following page, under the same circumstances?

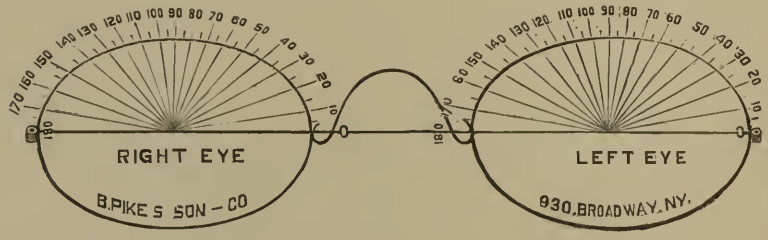
If you cannot read the *Test Types* at about *fourteen* inches from the eyes, at *what* distance can you read them?

By answering the above questions, we can furnish the *proper* Spectacles, which will be sent by mail, *pre-paid*, at the prices quoted.

TO OCULISTS.

We have the *greatest facilities* for the manufacture of Spectacles, and Lenses for the same, for the correction of Astigmatism, Strabismus, Cataract, Myopia, Hypermetropia, and other malformations of the eyes, requiring Cylindrical, Prismatic, Concave, Convex, and other Lenses of different curvatures, and are prepared to furnish the same at *very greatly reduced prices*. (See page 93.)

PRESCRIPTION BLANKS, like the following, will be *furnished on application*, on which it is only necessary to write the formula and enclose it to us by mail, when the order will be attended to with the *greatest promptness* and the most *absolute accuracy*.



℞

RIGHT EYE.			LEFT EYE.		
Spherical			Spherical		
Cylind.		Axis:	Cylind.		Axis:
Prism.	°	Base:	Prism.	°	Base:

Distance between centers of pupils, - - - inch.

" " temples, - - - - - - "

" from Canthus to crest of nasal bone, - "

M. D.

No. 1.

CAN YOU READ THIS PRINT BY BRIGHT DAYLIGHT AT ABOUT 14 INCHES FROM THE EYES?

We again turn from the siege of Boston, to the invasion of Canada, which at that time shared the anxious thoughts of Washington. His last accounts of the movements of Arnold, left him at Point Levi, opposite to Quebec. Something brilliant from that daring officer was anticipated. It was his intention to cross the river immediately. Had he done so, he might have carried the town by a *coup de main;* for terror as well as disaffection prevailed among the inhabitants. At Point Levi, however, he was brought to a stand; not a boat was to be found there. Letters which he had despatched some days previously, by two Indians, to Generals Schuyler and Montgomery, had been carried by his faithless messengers, to Caramhe, the lieutenant-governor, who, thus apprised of the impending danger, had caused all the boats of Point Levi to be either removed or destroyed. Arnold was not a man to be disheartened by difficulties. With great exertions he procured about forty birch canoes from the Canadians and Indians, with forty of the latter to navigate them; but stormy winds arose, and for some days the river was too boisterous for such frail craft. In the meantime the garrison at Quebec was gaining strength. Recruits arrived from Nova Scotia. The veteran Maclean, too, who had been driven from the month of the Sorel by the detachment under Brown and Livingston, arrived down the river with his corps of Royal Highland Emigrants, and threw himself into the place. The Lizard frigate, the Hornet sloop-of-war, and two armed schooners were stationed in the river, and guard-boats patrolled at night. The prospect of a successful attack upon the place was growing desperate. On the 13th of November, Arnold received intelligence that Montgomery had captured St. Johns. He was instantly roused to emulation. His men, too, were inspirited by the news. The wind had abated; he determined to cross the river that very night. At a late hour in the

No. 2.

CAN YOU READ THIS PRINT BY BRIGHT DAYLIGHT AT ABOUT 14 INCHES FROM THE EYES?

We again turn from the siege of Boston, to the invasion of Canada, which at that time shared the anxious thoughts of Washington. His last accounts of the movements of Arnold, left him at Point Levi, opposite to Quebec. Something brilliant from that daring officer was anticipated. It was his intention to cross the river immediately. Had he done so, he might have carried the town by a coup de main; for terror as well as disaffection prevailed among the inhabitants. At Point Levi, however, he was brought to a stand; not a boat was to be found there. Letters which he had despatched some days previously, by two Indians, to Generals Schuyler and Montgomery, had been carried by his faithless messengers, to Caramhe, the lieutenant-governor, who, thus apprised of the impending danger, had caused all the boats of Point Levi to be either removed or destroyed. Arnold was not a man to be disheartened by difficulties. With great exertions he procured about forty birch canoes from the Canadians and Indians, with forty of the latter to navigate them; but stormy winds arose, and for some days the river was too boisterous for such frailcraft. In the mean time the garrison at Quebec was gaining strength. Recruits arrived from Nova Scotia. The veteran Maclean, too, who had been driven from the mouth of the Sorrel by the detachment under Brown and Livingston, arrived down the river with his corps of Royal Highland Emigrants, and threw himself into the place. The Lizard

No. 3.

CAN YOU READ THIS PRINT BY BRIGHT DAYLIGHT AT ABOUT 14 INCHES FROM THE EYES?

frigate, the Hornet sloop-of-war, and two armed schooners were stationed in the river, and guard-boats patrolled at night. The prospect of a snccessful attack npon the place was growing desperate. On the 13th of Novemher, Arnold received intelligence that Montgomery had captured St. Johns. He was instantly roused to emulation. His men, too, were inspirited hy the news. The wind had ahated; he determined to cross the river that very night. At a late hour in the evening he emharked with the first division, principally riflemen. The river was wide; the current rapid; the birch canoes, easy to he upset, required skilful management. By fonr o'clock in the morning, a large part of his force had crossed without heing perceived, and landed ahout a mile and a half ahove Cape Diamond, at Wolfe's Cove, so called from heing the landing-place of that gallant commander. Just then a guard-hoat, belonging to the Lizard, came slowly along shore and discovered them. They hailed it, and ordered it to land. Not complying, it was fired into, and three men were killed. The hoat instantly pulled for the frigate, giving vociferous alarm. Without waiting the arrival of the residue of his men, for whom the canoes had heen despatched, Arnold led those who had landed to the foot of the cragged defile, once scaled hy the intrepid Wolfe, and scramhled up it in all haste. By daylight he

No. 4.

CAN YOU READ THIS PRINT BY BRIGHT DAYLIGHT AT ABOUT 14 INCHES FROM THE EYES?

had planted his daring flag on the far-famed Heights of Abraham. Here the main difficulty stared him in the face. A strong line of walls and bastions traversed the promontory from one of its precipitous sides to the other, inclosing the upper and lower towns. On the right, the great bastion of Cape Diamond crowned the rocky height of that name. On the left was the bastion of La Potasse, close by the gate of St. Johns, opening upon the barracks; the gate where Wolfe's antagonist, the gallant Montcalm, received his death-wound. A council of war was now held. Arnold, who had some knowledge of the place, was for dashing forward at once and storming the gate of St. Johns. Had they done so, they might have been successful. The gate was open and unguarded. Through some blunder and delay, a message from the commander of the Lizard to the lieutenant-governor had not yet been delivered, and no alarm had reached the fortress. The formidable aspect of the place, however,

GOLD SPECTACLES,

FITTED WITH GLASSES OF THE FINEST QUALITY.



800–805.

No.		Price.
800.	Gold Spectacles, Single Temples, 8 carat, per pair,	$5 50
801.	" " " " 10 " "	7 00
802.	" " " " 12 " "	8 00
803.	" " " " 14 " "	10 00
804.	" " " " 16 " "	11 00
805.	" " " " 18 " "	12 00

GOLD SPECTACLES,

FITTED WITH GLASSES OF THE FINEST QUALITY.

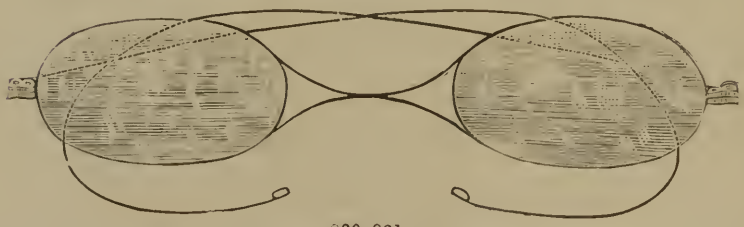


810–814.

810.	Gold Spectacles, Sliding Temples, 10 carat, per pair,	$9 00
811.	" " " " 12 " "	10 00
812.	" " " " 14 " "	11 00
813.	" " " " 16 " "	13 00
814.	" " " " 18 " "	15 00

GOLD RIDING SPECTACLES,

FITTED WITH GLASSES OF THE FINEST QUALITY.

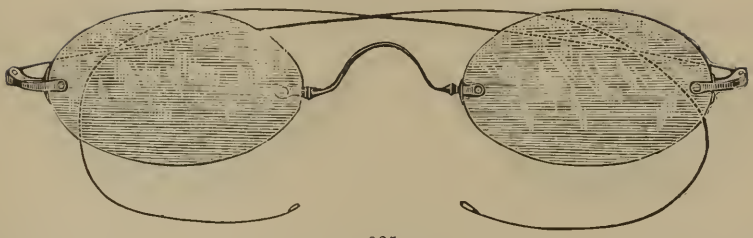


820–821.

820.	Gold Riding Spectacles, very delicate, 10 carat, per pair,	$6 00
821.	" " " " " 14 " "	7 50

GOLD FRAMELESS SPECTACLES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



825.

No.		Price.
825.	Gold Frameless Spectacles, 14 carats, per pair, ...	$7 50

COIN SILVER SPECTACLES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



830–831.

830.	Coin Silver Spectacles, Single Temples, per pair, ...	2 50
831.	" " " having Glasses of two different foci, divided in the centre—the lower part for reading, and the upper part for seeing at a distance, ...	3 50

COIN SILVER SPECTACLES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



835–836.

835.	Coin Silver Spectacles, Sliding Temples, per pair, ...	3 00
836.	" " " with Double Vision Glasses, ...	4 00

STEEL SPECTACLES.

FITTED WITH GLASSES OF THE FINEST QUALITY.

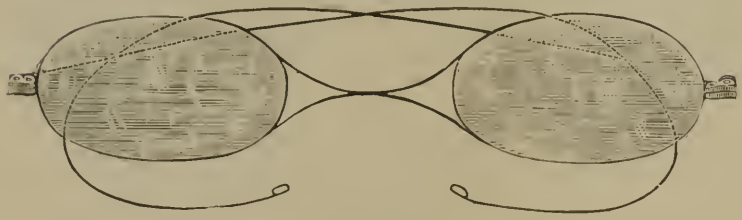


840–843.

No.		Price.
840.	Spectacles, with *finest* finished Steel Frames, per pair,	$2 00
841.	" " *fine* " " " " "	1 50
842.	" " medium " " " " "	1 00
843.	" " " " " " having Glasses of two different foci, divided in the center—the lower part for reading and the upper for seeing at a distance, per pair,	2 00

INVISIBLE STEEL SPECTACLES.

FITTED WITH GLASSES OF THE FINEST QUALITY.

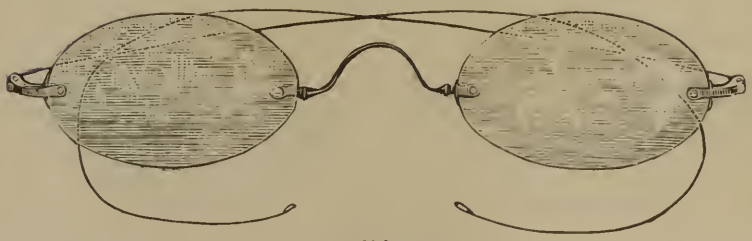


845–846.

845.	Invisible Steel Riding Spectacles, with Grooved Glasses, per pair,	2 50
846.	" " " " " " " *heavier* frames, per pair,	2 00

STEEL FRAMELESS SPECTACLES.

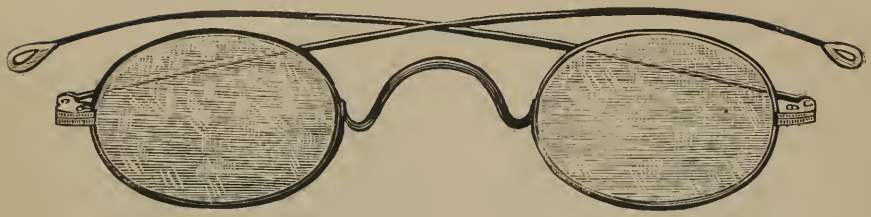
FITTED WITH GLASSES OF THE FINEST QUALITY.



850.

850.	Frameless Riding Spectacles, with *finest* finished Steel Frames, per pair,	2 50

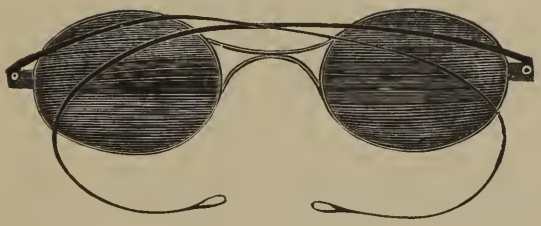
SPECTACLES WITH BRAZILIAN PEBBLES.



855.

No.		Price.
855.	Steel Spectacles, with Brazilian Pebbles of *finest* quality, per pair, . .	$4 00

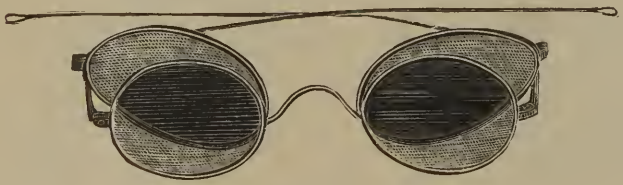
EYE PROTECTORS.



860.

860.	Coquille Spectacles, with large *cup shaped* glasses, of either blue or smoke color, for protecting the eyes from the glare of strong light, dust, etc., in very fine frames, having hook sides to fit over the ears, per pair, . .	$2 00
861.	Coquille Spectacles, finest quality, Single Temples, " " . .	1 50
862.	" " medium " " " " " . .	75

WIRE GAUZE EYE PROTECTORS.



865–867.

865.	Wire Gauze Eye Protectors, with Steel Temples and plane, white, green, blue or smoke glasses, *finest* finished frames, per pair, ...	2 00
866.	Wire Gauze Eye Protectors, fine finished frames, per pair, . . .	1 50
867.	" " " " medium " " " . . .	1 00
868.	" " " " with elastic bands instead of Steel Temples, .	50

GOLD EYE-GLASSES.

FITTED WITH GLASSES OF THE FINEST QUALITY.

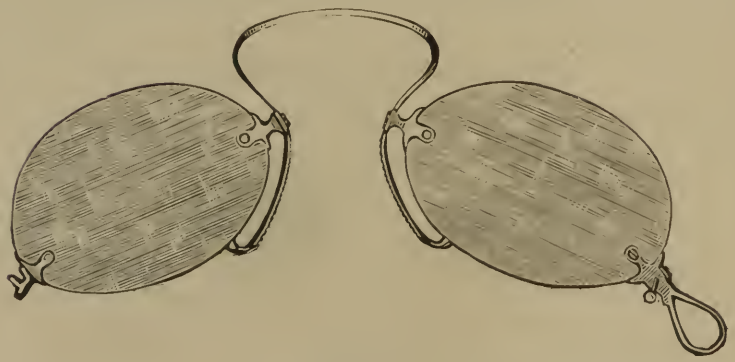


870–875.

No.		Price.
870.	Gold Eye-Glasses, with Patent Spring, 8 carat. per pair, . . .	$5 00
871.	" " " " " " 10 " " " . . .	5 50
872.	" " " " " " 12 " " " . . .	6 50
873.	" " " " " " 14 " " " . . .	7 50
874.	" " " " " " 16 " " " . . .	9 00
875.	" " " " " " 18 " " " . . .	10 00

GOLD FRAMELESS EYE-GLASSES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



880–881.

880.	Gold Frameless Eye-Glasses, 14 carat mountings, per pair, . .	$6 00
881	" " " " with Brazilian Pebbles, "	10 00

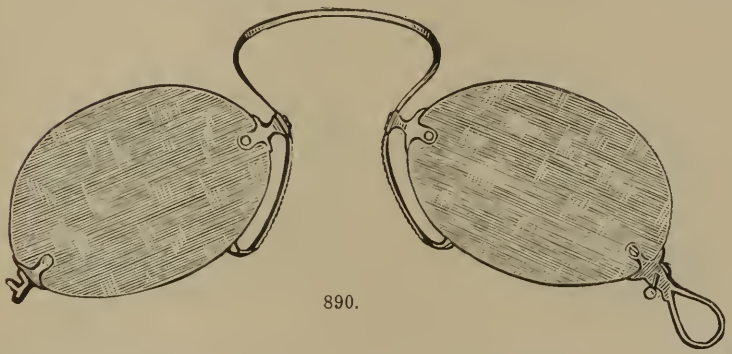
STEEL EYE-GLASSES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



885–887.

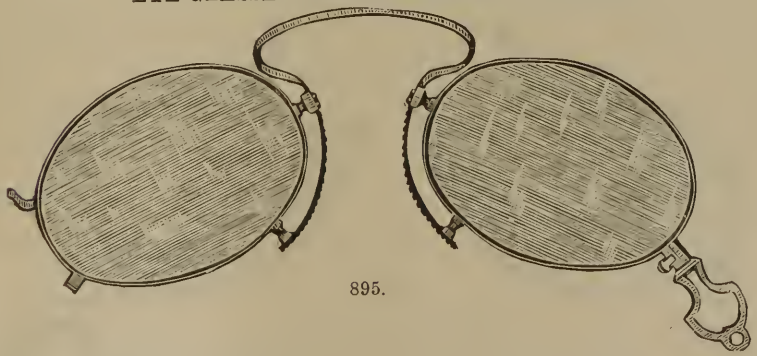
No.		Price.
885.	Steel Eye-Glasses, *finest* frames, grooved glasses, per pair, . . .	$2 50
886.	" " " not grooved glasses, per pair, . . .	2 00
887.	" " medium frames, . . . " . . .	1 50



890.

890. Frameless Eye-Glasses, with *finest* steel mountings, per pair, . . . $2 00

EYE-GLASSES WITH BRAZILIAN PEBBLES.



895.

895. Steel Eye-Glasses, with Brazilian Pebbles of *finest* quality, per pair, . $4 00

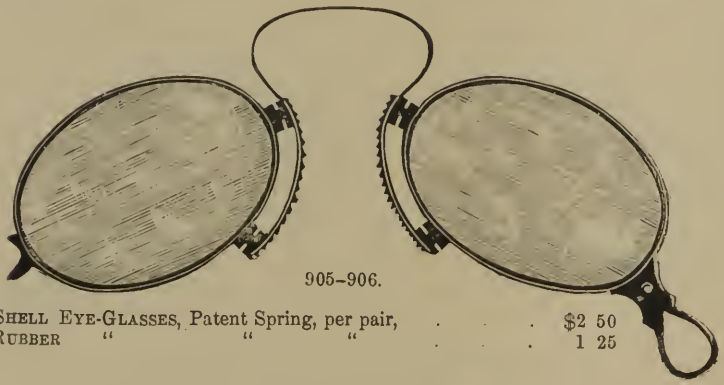
SHELL AND RUBBER EYE-GLASSES.

FITTED WITH GLASSES OF THE FINEST QUALITY.



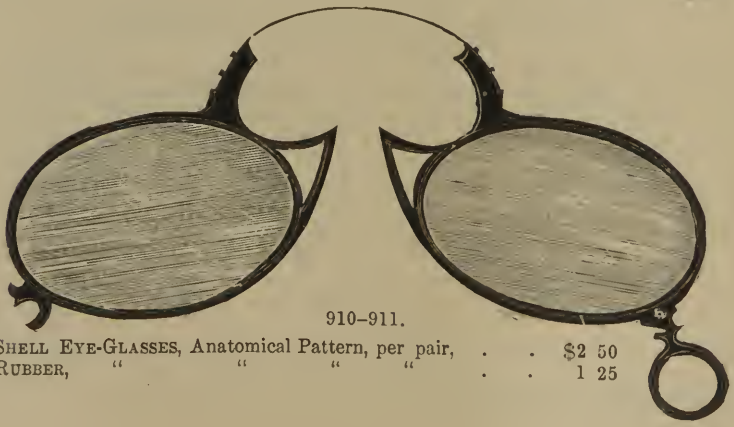
900–902.

No.		Price.
900.	Shell Eye-Glasses, Bow Spring, per pair,	$2 00
901.	Steel " " "	1 50
902.	Rubber " " "	1 00



905–906.

905.	Shell Eye-Glasses, Patent Spring, per pair,	$2 50
906.	Rubber " " "	1 25



910–911.

910.	Shell Eye-Glasses, Anatomical Pattern, per pair,	$2 50
911.	Rubber, " " " "	1 25

CONVEX AND CONCAVE SPECTACLE GLASSES.

Any of the following Glasses, all of which are of the *finest quality*, fitted to any *Frame*, at the following prices:

No.		Price.
920.	Periscopic, or Double Convex White Lenses, from 5 to 72 inches focus, per pair,	$0 75
921.	Periscopic, or Double Convex White Lenses, from 1 to 4¾ inches focus, "	1 50
922.	Double Convex White, Divided or Franklin Lenses, per pair,	1 50
923.	" " " Lenses, two foci on one glass, "	1 50
924.	Periscopic, or Double Convex Tinted Lenses, Blue, Green or Smoke, per pair,	1 50
925.	Periscopic, or Double Concave White Lenses, from 5 to 72 inches focus, per pair,	1 00
926.	Periscopic, or Double Concave White Lenses, from 1 to 4¾ inches focus, per pair,	1 50
927.	Periscopic, or Double Concave Tinted Lenses, Blue, Green or Smoke, per pair,	1 50
928.	Plane, Blue, Green or Smoke-colored Glasses, per pair,	1 00

CYLINDRICAL SPECTACLE LENSES.

935.	Plano-Convex, or Concave Cylindrical White Lenses, per pair,	2 00
936.	" " " " " single lens,	1 00
937.	Sphero-Convex, " " " " per pair,	3 50
938.	" " " " " single lens,	2 00
939.	Plano-Convex, or Concave Cylindrical and Prismatic White Lenses, per pair,	4 00
940.	Plano-Convex, or Concave Cylindrical and Prismatic White Lenses, single lens,	2 00
941.	Sphero-Convex, or Concave Cylindrical and Prismatic White Lenses, per pair,	5 00
942.	Sphero-Convex, or Concave Cylindrical and Prismatic White Lenses, single lens,	2 50
943.	Crossed Cylindrical Lenses, Convex or Concave, White, per pair,	5 00
944.	" " " " " " single lens,	3 00

Any of the above Cylindrical Lenses fitted in Eye-glass or Spectacle frames at an additional cost of $1.00.

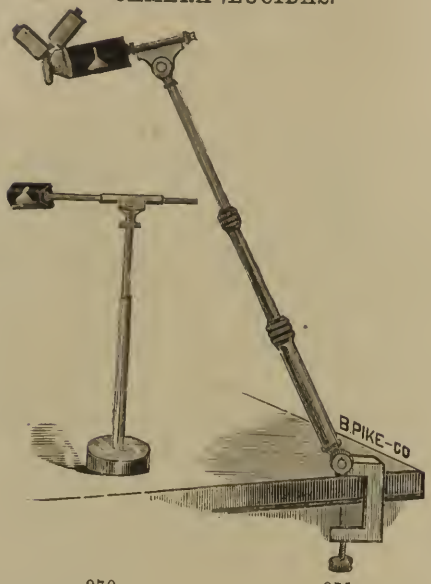
PRISMATIC SPECTACLE LENSES.

950.	Plane Prismatic Lenses, White, per pair,	2 00
951.	" " " single prism,	1 25
952.	Sphero-Prismatic " " per pair,	3 50
953.	" " " single prism,	2 00

PEBBLE SPECTACLE LENSES.

960.	Periscopic, or Double Convex Pebble Lenses, per pair,	3 00
961.	" " Concave " " "	3 00

CAMERA LUCIDAS.



970. 971.

No.		Price.
970.	Camera Lucida, with sliding tube and round base, ...	$7 50
971.	Camera Lucida, with extension tubes, clamp for fastening to the table, and colored glasses for modifying the light, ...	15 00

DIRECTIONS FOR USING THE CAMERA LUCIDA.

The instrument being fixed by the screw and clamp to the table and paper on which the drawing is to be made, its stem should be inclined so as to bring the prism nearly over the center of the paper, and the pin, on which the prism turns, placed truly horizontal.

The prism is next to be turned upon its pin, till the transparent rectangular face be placed opposite to the objects to be delineated, when the upper black surface of the eyepiece will be on the top of the instrument; and through the aperture in this the artist is to look perpendicularly downwards at his paper.

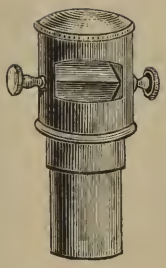
The black eyepiece is movable, and in ordinary circumstances is to be in such a position that the edge of the small transparent part at the back of the prism shall intercept about half the eyehole. The artist then, looking through the eyehole, directly downwards at his paper, should see the objects he wishes to draw, apparently distributed over the paper. For, since the eye is larger than the eyehole, he sees through both halves of the hole at the same time without moving his head. He sees the paper through the nearer half, and sees the objects at the same time through the farther half, apparently in the same direction, by means of reflection, through the prism.

The position of the EYEHOLE is the circumstance, above all others, necessary to be attended to in adjusting the *Camera Lucida* for use; for, on the due position of this hole depends the possibility of seeing both the pencil and the objects distinctly at the same time.

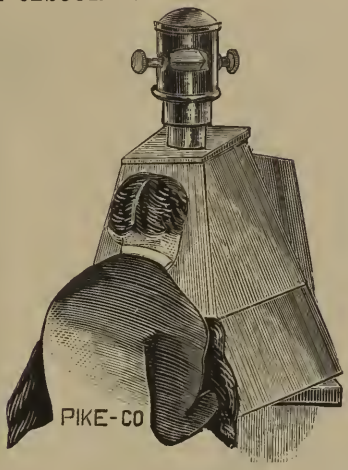
If the eyehole be moved, so that nearly the whole of its aperture be over the paper, and a very small portion over the prism, then the pencil and paper will be very distinctly seen, but the objects to be delineated very dimly. If, on the other hand, the aperture be mostly over the prism, and but a small portion over the paper, then the objects will be seen distinctly, but the pencil and paper will be very faint. But there will always be an intermediate position (varying according as the objects or the paper happen to be most illuminated) in which both will be sufficiently visible for the purpose of delineation, though not quite so clear as to the naked eye. This intermediate position is easily found with a little practice.

The farther the prism is removed from the paper, that is, the longer the stem is drawn out, the larger the objects will be represented in the drawing, and accordingly the less extensive the view.

CAMERA OBSCURAS.



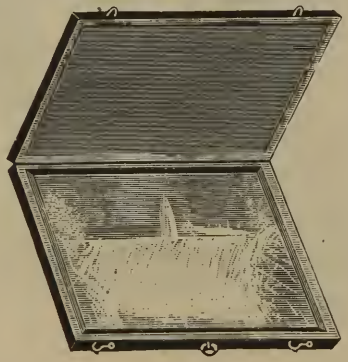
980–982.



983.

No.		Price.
980.	Brass Camera Obscura Head, with Prism, Lens $1\frac{5}{8}$ inches long, . . .	$5 00
981.	" " " " " " " $1\frac{7}{8}$ " " . . .	7 50
982.	" " " " " " " $2\frac{1}{8}$ " " . . .	10 00
983.	Portable Camera Obscura of improved form, opening when in use, as shown in cut, and when closed forming a box about 22 inches long, 16 inches wide, and 4 inches deep, which can be conveniently carried under the arm,	20 00
984.	Camera Obscura of simpler form, in Walnut case, ...	4 00

CLAUDE LORRAINE, OR LANDSCAPE MIRRORS.



990–995.

The *Claude Lorraine* is a black convex Mirror for reflecting landscapes, clouds, sunsets, &c., in true perspective. Of great value to the artist and to the tourist. An ever-changing picture of natural beauty.

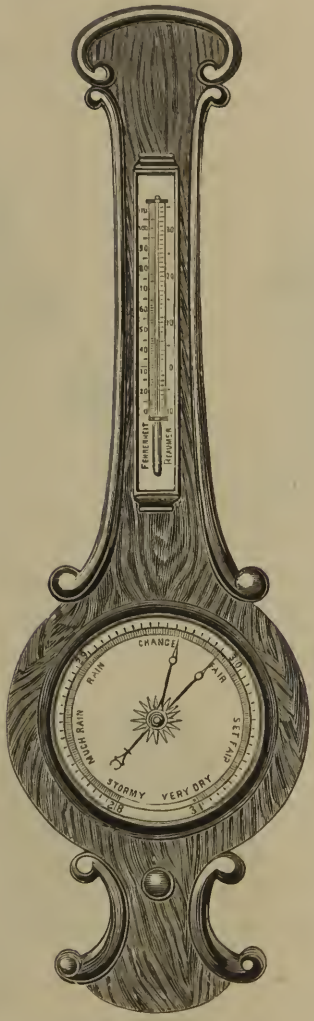
990.	Mirror, $6\frac{1}{4}$	inches long by	$5\frac{1}{4}$	inches wide,	in strong	Morocco	case, each .	$5 50
991.	" $7\frac{1}{2}$	"	$5\frac{1}{4}$	"	"	"	" .	6 00
992.	" $7\frac{1}{2}$	"	$6\frac{1}{4}$	"	"	"	" .	7 50
993.	" $8\frac{1}{2}$	"	$6\frac{1}{4}$	"	"	"	" .	9 00
994.	" $8\frac{1}{2}$	"	$7\frac{1}{2}$	"	"	"	" .	10 00
995.	" $9\frac{1}{2}$	"	$7\frac{1}{2}$	"	"	"	" .	11 00



1000.



1005.



1010.



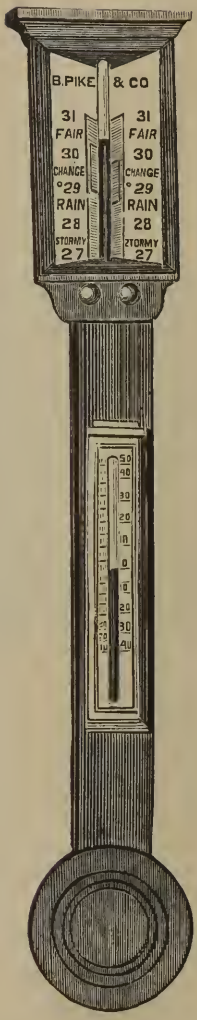
1020.

MERCURIAL BAROMETERS.

No.		Price.
1000.	Agricultural Barometer, mahogany or walnut frame, each,	$6 00
1005.	Popular Barometer, rosewood, walnut, or oak frame, "	10 00
1010.	Wheel Barometer, *plain*, " " " " " "	10 00
1015.	" " *elegantly finished*, " " " " "	20 00
1020.	Model Barometer, rosewood, walnut, or oak frame, "	16 00



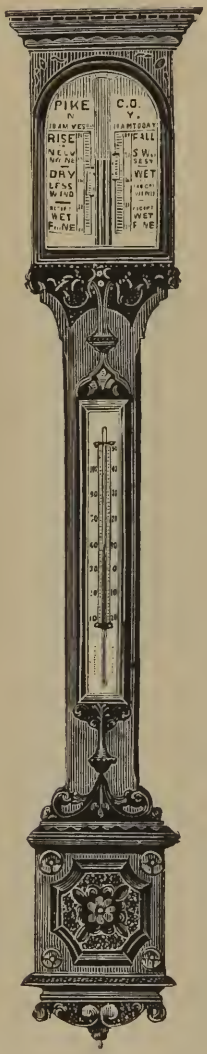
1025.



1030.



1035.



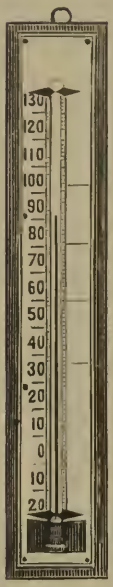
1040.

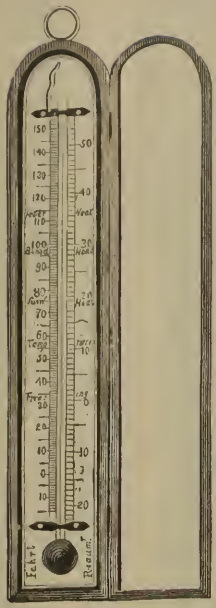
MERCURIAL BAROMETERS.

No.		Price.
1025.	LIBRARY BAROMETER, rosewood, walnut, or oak frame, ...	$20 00
1030.	CABINET BAROMETER, *elegantly finished*, rosewood, walnut, or oak frame, .	30 00
1035.	" " *very elegantly finished*, " " " " .	40 00
1040.	" " *richly carved*, " " " " .	50 00


1050.


1055.


1060.


1070.

TIN CASE THERMOMETERS.

No.		Price.
1050.	Tin Case Thermometer, 8 inches long, each,	$0 50
1051.	" " 10 " " "	75
1052.	" " 12 " " "	1 00

BOXWOOD THERMOMETERS.

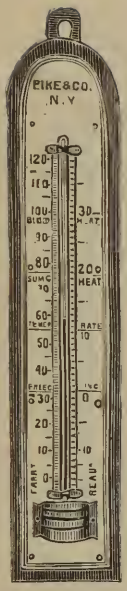
1055.	Boxwood Thermometer, with sunken tube, 8 inches long, each,	1 00
1056.	" " " " " 10 " " "	1 50
1057.	" " " " " 12 " " "	2 00

THERMOMETERS ON POLISHED WALNUT.

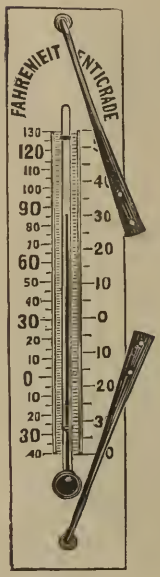
1060.	Thermometer, on polished walnut, with metal scale, 8 inches long, each,	1 00
1061.	" " " " 10 " " "	1 50
1062.	" " " " 12 " " "	2 00
1063.	" " " " 16 " " "	3 00
1064.	" " " " 30 " " "	7 00
1065.	" " " " 44 " " "	12 00

POCKET THERMOMETERS.

1070.	Pocket Thermometer, with ivory scale, in Morocco case, 3 inches long, each,	2 00
1071.	Pocket Thermometer, with ivory scale, in Morocco case, 4 inches long, each,	2 50
1072.	Pocket Thermometer, with ivory scale, in Morocco case, 5 inches long, each,	3 00
1073.	Pocket Thermometer, with ivory scale, in Morocco case, 6 inches long, each,	3 50



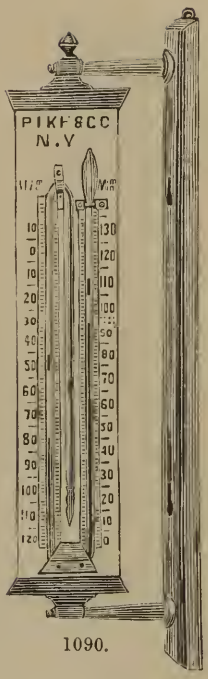
1075.



1080.



1085.



1090.

PARLOR THERMOMETERS.

No.		Price.
1075.	Parlor Thermometer, Porcelain Scale on Ebony, 8 inches long, each, .	$4 00
1076.	" " " " " " 10 " " " " .	6 00
1077.	" " " " " " 12 " " " " .	8 00

TRANSPARENT WINDOW THERMOMETERS.

1080.	Window Thermometer, Plate Glass, with supports, 12 inches long, each, .	3 00

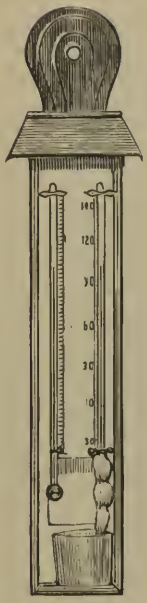
SELF-REGISTERING THERMOMETERS.

1085.	Self-Registering Thermometer for Heat and Cold, 8 inches long, each, .	4 00
1086.	" " " " " " " 10 " " " " .	6 00
1087.	" " " " " " " 12 " " " " .	8 00

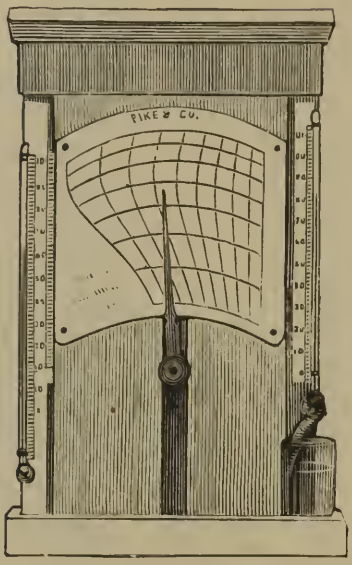
SELF-REGISTERING THERMOMETERS, WITH BRACKETS.

1090.	Self-Registering Thermometer, Transparent, with Bracket for window, 12 inches long, each, ...	12 00
1091.	Self-Registering Thermometer, Transparent, with Bracket for window, 14 inches long, each, ...	15 00

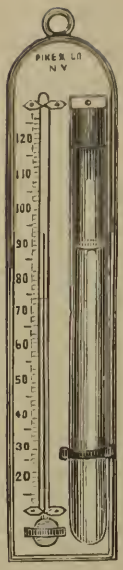
HYGROMETERS.



1095.



1100.



1105.

Mason's Hygrometer is an instrument for measuring the amount of moisture in the atmosphere. It consists of two delicate thermometers, mounted side by side, on a metal scale. One of the bulbs is covered with muslin, which dips into a small vessel of water below it, keeping it continually moist.

The difference between the two thermometers gives the relative amount of moisture.

This instrument is of great value in the sick chamber, where the condition of the atmosphere is a matter of *vital* importance; also in Drying Rooms, Manufactories, Dye Houses, etc.

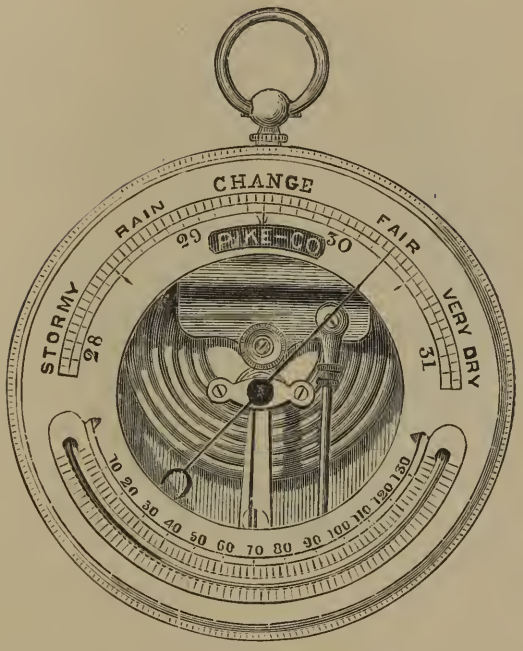
(A Circular describing its value and importance will be sent on application.)

No.		Price.
1094.	Mason's Hygrometer, plain form,	$3 50
1095.	" " Boxwood Scale and Metallic Case,	5 00
1096.	" " large size for manufactories,	10 00
1100.	Edson's Hygrometer, or Hygrodeik, with Humidity Scale,	15 00

STORM GLASSES.

1105.	Boxwood Storm Glass, with Thermometer, 8 inches long,	1 50
1106.	" " " " " 10 " "	2 00
1107.	" " " " " 12 " "	2 50

ANEROID BAROMETERS.



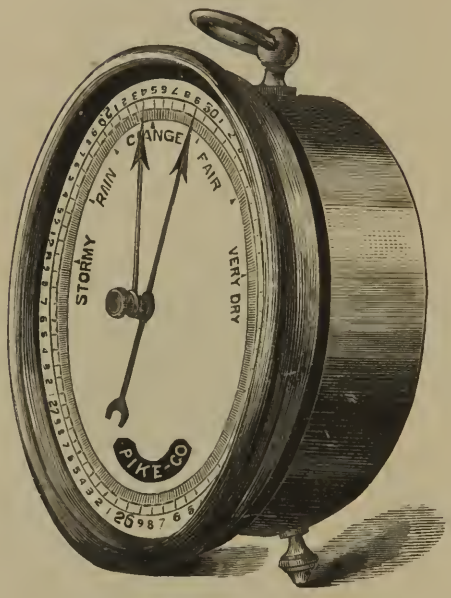
1125, 1126.

The Aneroid Barometer derives its name from the fact that *no liquid* is used in its construction. It consists of a flat metal box, almost entirely exhausted of air, the top of which is made of thin corrugated metal, so elastic that it readily yields to the varied pressure of the atmosphere.

When the pressure of the atmosphere increases, the corrugated top is pressed inward; when on the contrary the pressure of the atmosphere decreases, the elasticity of this corrugated top, aided by a spring, tends to move it in an opposite direction. These motions are connected by delicate multiplying levers to an index, which moves on a scale or dial.

The instrument is graduated by comparing its indications under different pressures with those of a mercurial barometer. The Aneroid has the advantage of being very portable, and can be transported anywhere without getting out of order.

ANEROID BAROMETERS.



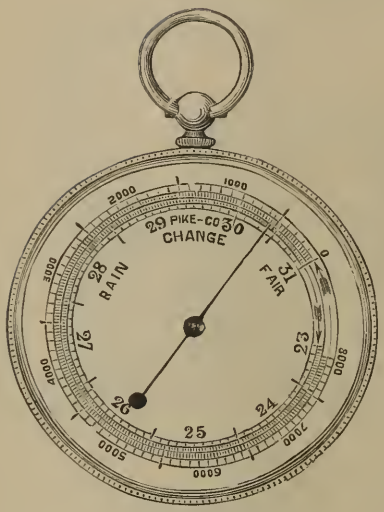
1120–1122.

The Aneroid Barometer is *invaluable* to the mariner, as it enables him to take an observation at any time and in all sorts of weather.

Aneroid Barometers are now made to *great perfection*, of such a small size that they can be carried in the pocket like a watch, and of such delicate construction as to indicate the difference in pressure between the height of an ordinary table and the ground. (See page 103.)

No.		PRICE.
1120.	ANEROID BAROMETER, of fine quality, 3 inches diameter, ...	$5 00
1121.	" " " " 4 " "	7 00
1122.	" " finest " 4½ " "	10 00
1123.	" " open face, fine quality, 4 inches diameter, . . .	10 00
1124.	" " " " finest " 4½ " " . . .	14 00
1125.	" " " " metal dial, with Thermometer, 4½ in. diam.,	18 00
1126.	" " " " " " " " 6 " "	20 00

POCKET ANEROID BAROMETERS.



1135–1142.



1145–1147.

Our Pocket Aneroid Barometers, for measuring heights, are instruments of the greatest delicacy of workmanship and movement, and can be relied upon for their *entire accuracy*. They are thoroughly *compensated* for temperature, and have a graduated scale for recording elevations.

No.									Price.
1135.	Pocket Aneroid Barometer,			Compensated,	1¾	inches	diameter,	8,000 feet,	$20 00
1136.	"	"	"	"	"	"	"	12,000 "	23 00
1137.	"	"	"	"	"	"	"	16,000 "	25 00
1138.	"	"	"	"	"	"	"	20,000 "	27 00
1139.	"	"	"	"	2½	"	"	8,000 "	20 00
1140.	"	"	"	"	"	"	"	12,000 "	23 00
1141.	"	"	"	"	"	"	"	16,000 "	25 00
1142.	"	"	"	"	"	"	"	20,000 "	27 00

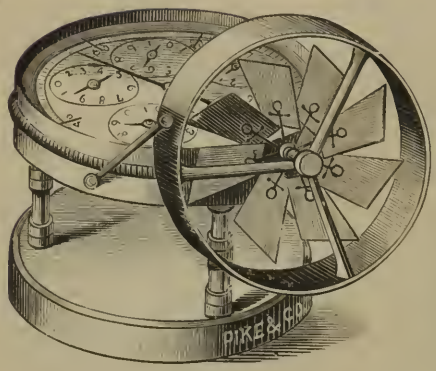
Any of the above furnished with Thermometers, at an additional charge of $2.

1145. Pocket Aneroid, same as No. 1135, with Compass and Thermometer on reverse side, ... 25 00

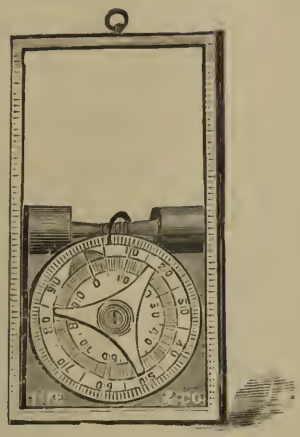
1146. Pocket Aneroid, same as No. 1136, with Compass and Thermometer on reverse side, ... 28 00

1147. Pocket Aneroid, same as No. 1137, with Compass and Thermometer on reverse side, ... 30 00

ANEMOMETERS AND ODOMETERS.



1150.



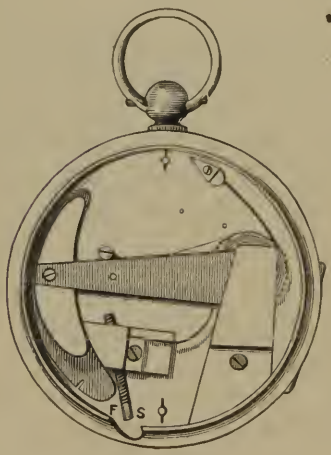
1155.

No. PRICE.

1150. ANEMOMETER, or AIR METER, a very delicate instrument for measuring the velocity of currents of air or wind, having five recording dials, with *full directions*, ... $30 00

1155. ODOMETER, an instrument for measuring the number of miles travelled by a carriage or wagon, by being attached to the hub of the wheel; in leather case, with straps for securing it, with *full directions*, ... 15 00

PEDOMETERS.



(Reverse Side)

1156.

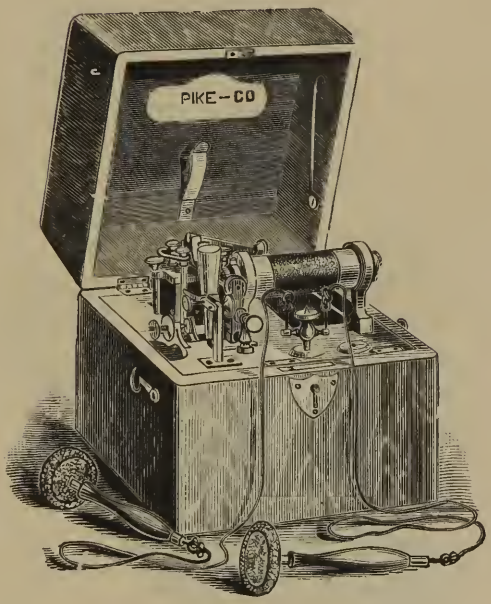


(Face.)

1156. PEDOMETER, for measuring distances in walking, each $5 00

1157. PASSOMETER, for recording the number of *steps* in walking, each . . . 9 00

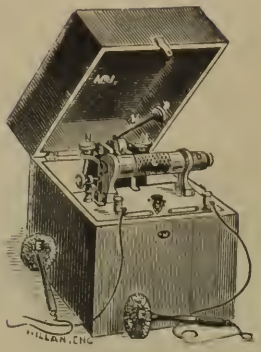
GALVANIC BATTERIES.



The use of Electricity for Medical Purposes, confined some years since to a few specialists, has now become so general that every practitioner is supposed to be acquainted with it as a regular part of his education. The circle of diseases treated by this agent, at present, extends so wide, that he who does not employ it leaves out of his practice a remedy far more universal than any in the whole range of medical treatment. Among the diseases in which it is deemed to be especially serviceable are Ague, Amenorrhœa, Anæsthesia, Aphonia, Asphyxia, Constipation, Debility, Facial Palsy, Hysterical Palsy, Inertia of the Womb in Labor, Infantile Palsy, Laryngeal Palsy, Muscular Atrophy, Prolapsus Ani, Prolapsus Uteri, Rheumatism Arthritic, Rheumatism Muscular, Rheumatism Chronic, Strabismus, Traumatic Palsy, Suspended Respiration, Uterine Hemorrhage, etc., etc.

Our Galvanic Batteries are constructed expressly for *Medical Use*, and their completeness is the result of experience and experiment, aided by the suggestions and advice of many prominent Physicians and Surgeons who have kindly given us the benefit of their practical knowledge.

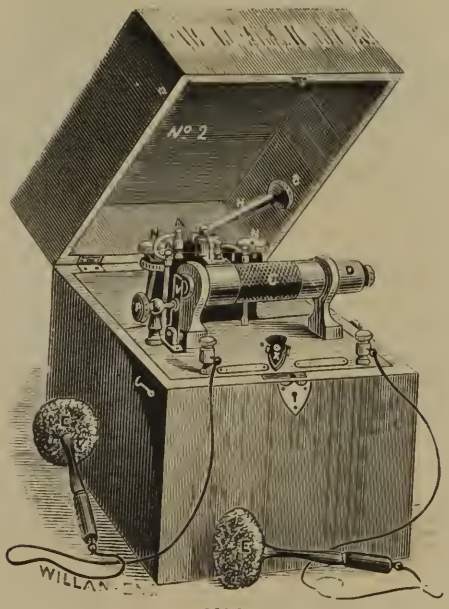
They combine Elegance, Simplicity, Power, Endurance, Facility of Use, Range of Effects, and Cheapness.



1165.

No.		Price.
1165.	GALVANIC BATTERY, small size, nickel-plated, for family use, ...	$10 00

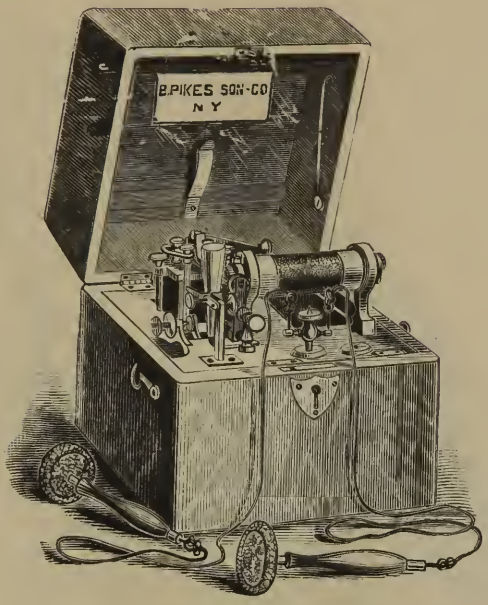
(Full directions accompany each instrument.)



1170.

1170. GALVANIC BATTERY, nickel-plated, of larger size than No. 1165, for family use, ... 15 00

(Full directions accompany each instrument.)

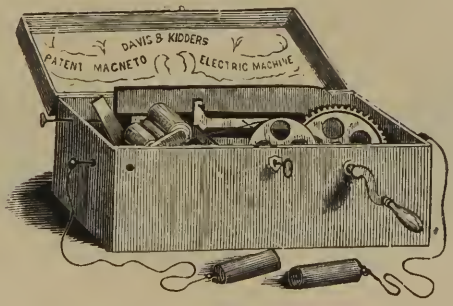


1175.

No. PRICE.

1175. GALVANIC BATTERY, nickel-plated, same size as No. 1170, with *Muscular Shock Vibrator*, ... $20 00

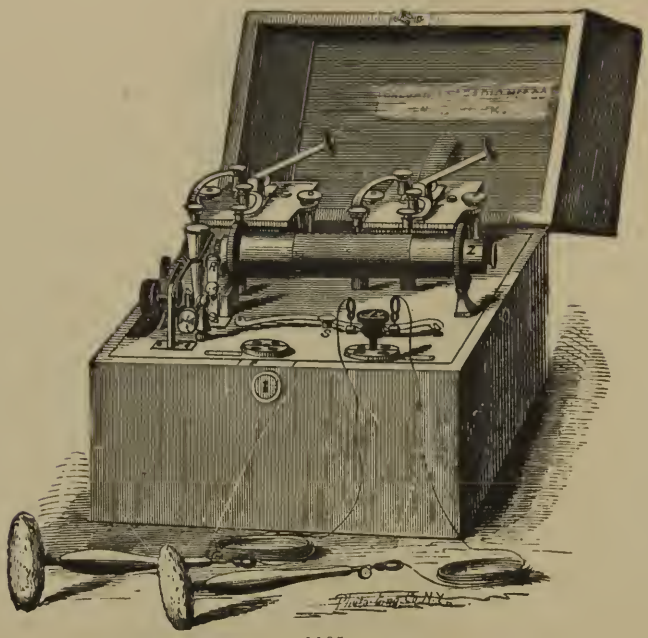
(Full directions accompany each instrument.)



1180.

1180. IMPROVED MAGNETO-ELECTRIC MACHINE, ... 9 00

This instrument requires *no acid*, and operates by turning a crank.



1185.

No.		Price.
1185.	Galvanic Battery, nickel-plated, largest size, with two cells, . . .	$35 00

(Full directions accompany each instrument.)

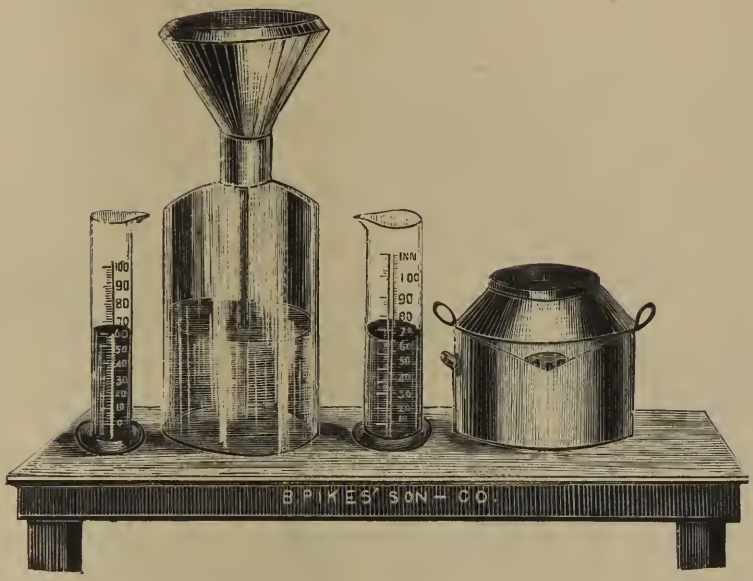


1190.

1190.	Gaiffe's Pocket Electro-Medical Battery, giving *three* currents, . .	10 00

(Full directions accompany each instrument.)

RAIN GAUGES.



1195. 1196.

PIKE'S IMPROVED RAIN GAUGE consists of a tall glass receiver or bottle, through the neck of which is inserted the long terminal tube of a funnel-shaped brass vessel, having a ring at the top of the proper diameter to receive the requisite area of rain. A glass vessel accompanies the Gauge, into which its contents are poured after the rain, which, being graduated in $\frac{1}{100}$ths of an inch, enables the observer to determine the quantity of rain that has fallen.

No.		Price.
1195.	PIKE'S IMPROVED RAIN GAUGE, complete, with Glass Gauge,	$5 00
1196.	SMITHSONIAN RAIN GAUGE, large size, " " " "	10 00

SPECTROSCOPES.



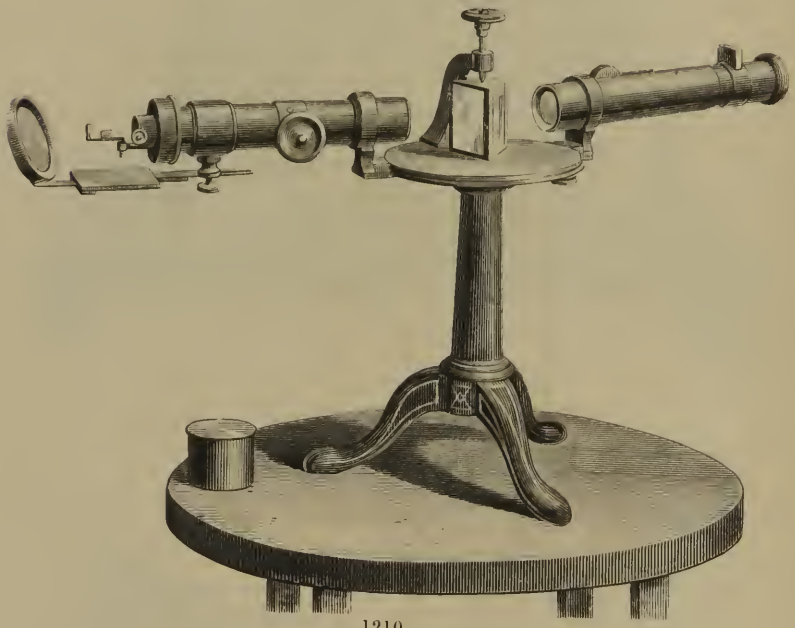
1200.

No. PRICE.

1200. DIRECT VISION POCKET SPECTROSCOPE, 3½ inches long, ... $12 00

This Spectroscope will show many of Fraunhofer's lines, the bright lines of the metals, and gases, and the absorption bands in colored gases, crystals and liquids.

THE STUDENT'S SPECTROSCOPE.



1210.

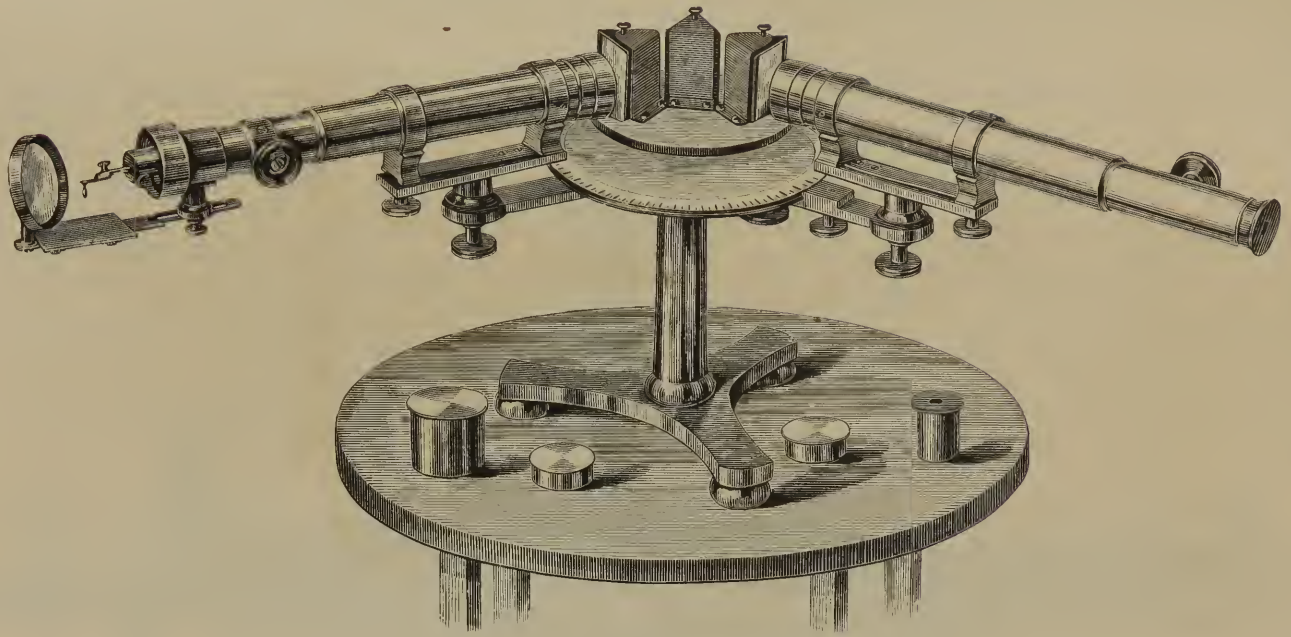
1210. THE STUDENT'S SPECTROSCOPE, packed in a fine Mahogany case, . . . $60 00

This Spectroscope has a *fine* prism of extremely dense glass. The circle is divided and reacts with a vernier, thus dispensing with the inconvenience of an illuminated scale. This arrangement possesses the very great advantage of giving angular measurements instead of those of an entirely arbitrary scale.

The slit is furnished with a reflecting prism, by means of which two spectra can be shown in the field of view at the same time.

This instrument is so arranged that with a slight alteration of the adjustments, it can be used for taking the refractive and dispersive powers of solids or liquids.

LARGER IMPROVED CHEMICAL SPECTROSCOPE.

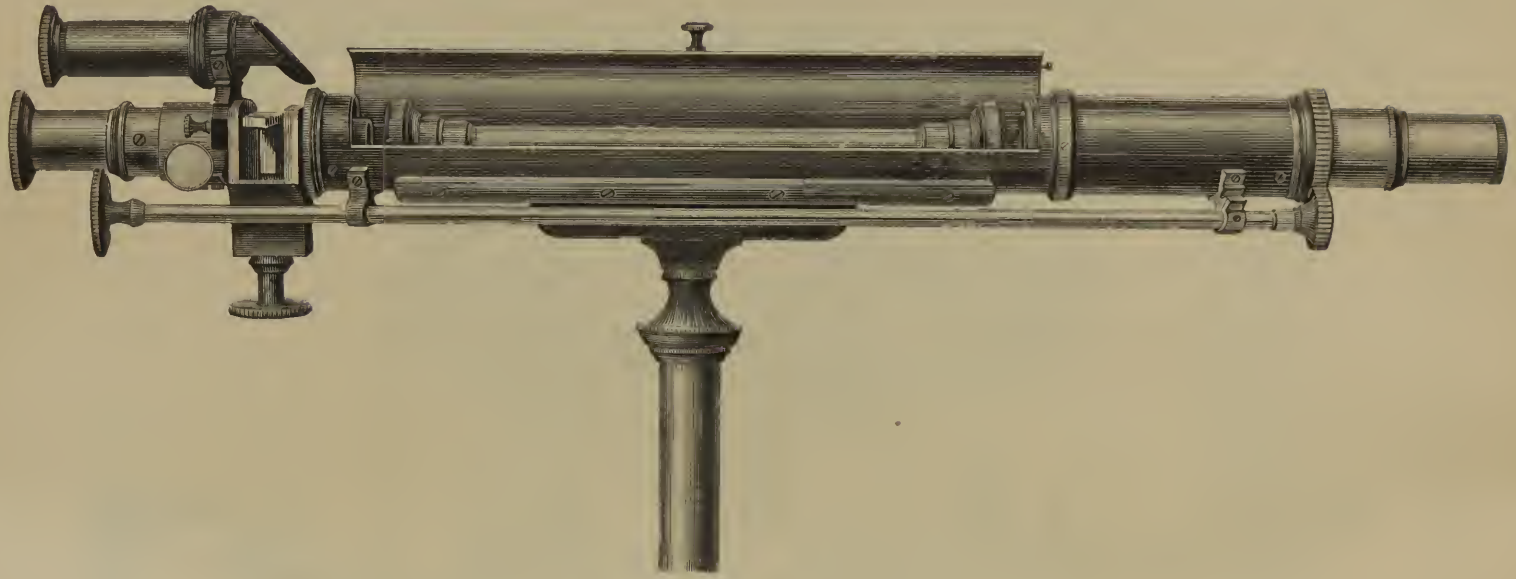


1220.

No.		Price.
1220.	Larger Improved Chemical Spectroscope, packed in a fine Mahogany case, ...	$125 00

This Spectroscope is made entirely of brass, *highly finished*, containing three *very dense* glass prisms, two Eyepieces; rack motion to telescope and tangent screw motion to vernier. Practically, it is an instrument of *great value*, as it not only *widely separates* the D line of the solar spectrum, but also shows the *nickel* line between the same.

SACCHAROMETER, FOR THE POLARIZATION OF SUGAR.



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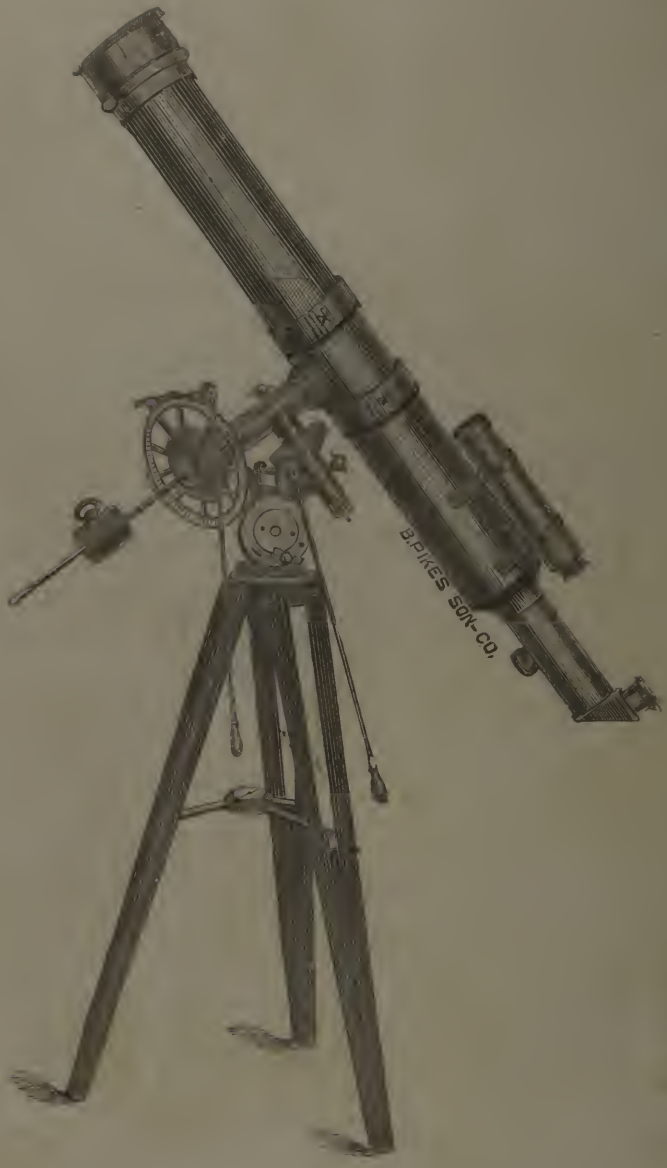
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