Beck Microscopes.

'Star.'
'British Students'.'
'LONDON.'
'Pathological.'
'Imperial.'

Microscope
Object Glasses.
Eyepieces.
Condensers.

For Metallurgical and Petrological Microscopes see special lists.

For Apparatus and Appliances see special lists.

R. & J. BECK, Ltd.,
68, CORNHILL,
LONDON.

Factory: KENTISH TOWN, LONDON, N.W.

The Microscope Stands.

The 'Star.' (Nos. 40, 42, 43.)

This instrument has a steady triangular shaped foot standing on three toes, and is steady in every position. It has an inclining joint. Stand No. 40 has a sliding coarse adjustment; Stands Nos. 42 and 43 a spiral rack and pinion coarse adjustment. The fine adjustment is by micrometer screw and is thoroughly good. A Draw-tube to the body, an Iris diaphragm in sliding fitting below the stage and a double mirror are supplied with each instrument; a small Abbé Condenser, price **10/0**, may be added, which will fit over the Iris diaphragm, focussing in the substage tube into which the Iris diaphragm fits. The Stand is made of brass throughout, bronzed black with the exception of the milled heads. A wooden case is included in the price of the Stand.

The 'British Students'.'

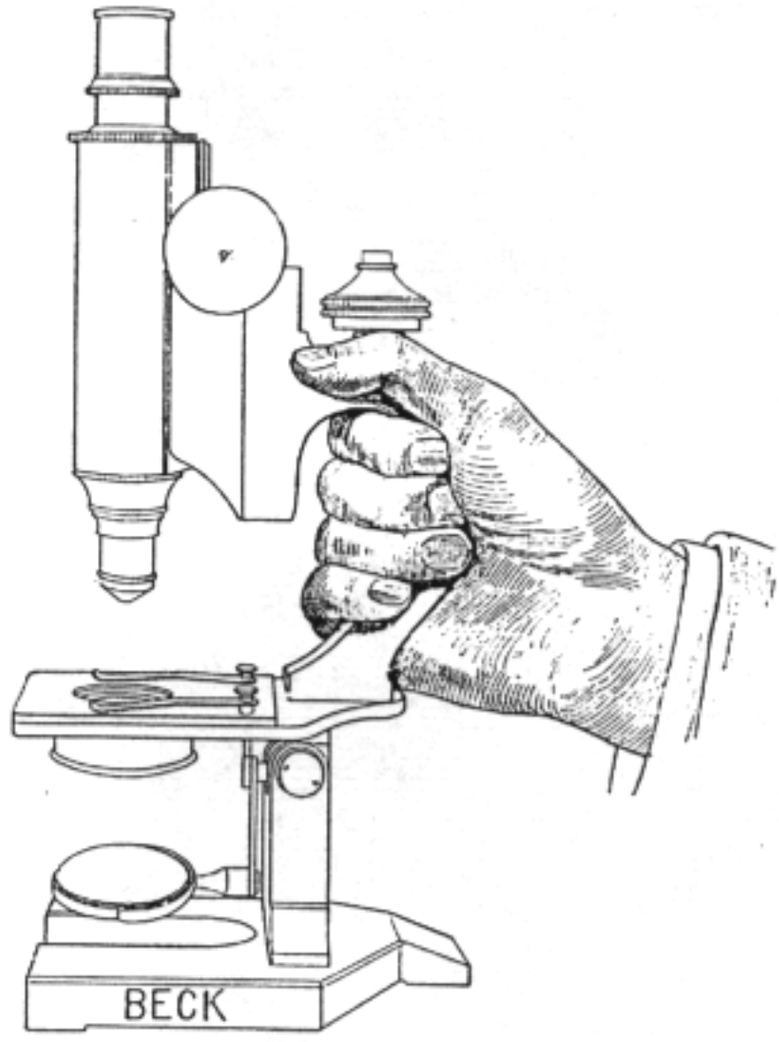
(Nos. 54, 55, 1056, 1057.)

This instrument is larger and heavier than the "Star," the foot is a solid heavy tripod with a spread of 6 inches between each leg. It stands on three cork pads let into the toes. It has inclining joint and is steady in every position. Fine adjustment somewhat on the model of that of the "Star" with larger milled head and finer screw. The square stage has a distance of 2½ inches from the centre of the stage to the limb, and No. 1056 is provided with an extra large stage 4 in. × 4 in. for Bacteriological work. Stand No. 54 has a sliding coarse adjustment, Stands Nos. 55, 1056, 1057, spiral rack and pinion coarse adjustments. A draw-tube divided in millimetres is fitted to the body. An Iris diaphragm and a double mirror are supplied with each instrument. The Stand is finished in Enamel Black with Bright Milled Heads, and a Polished Mahogany Cabinet with handle and lock is included in the price of the Stand.

The 'London.'

(Nos. 1124, 1325, 1329, 1353, 1330, 1331, 1132, 1127.)

This Instrument is entirely first-quality throughout. We have put down an extensive plant of machinery to produce a standard model in great numbers and make a first-quality stand at a low price. It has been adopted as the standard model in most of the Universities and schools.



The Base and Pillar are so designed that although the Continental Model has been retained, the position of the centre of the inclining joint has been so placed as to give greater stability when the instrument is in the horizontal position, whilst not interfering with its vertical rigidity. No. 1124 is a simpler model, without a joint. The base actually rests on three feet, into which are inserted cork pads to prevent scratching of the table. These can be removed if desired.

The Stage is square, the upper surface, except in the case of the Vertical Model No. 1124 being faced with an ebonite surface. In the instruments Nos. 1124, 1325, 1329 and 1127 it measures $3\frac{1}{4}$ in. × $3\frac{1}{4}$ in. In the large model instruments Nos. 1353, 1331 and 1332 it is specially large for the examination of Petri dishes or culture plates, and measures 4 in. × 4 in. A removable mechanical stage can be attached at will to any of these instruments without returning the microscope to us, though it is preferable to have it fitted when ordering the instrument, in order that the finder divisions may always register exactly.

The Adjustments.—The coarse adjustment is by spiral rack and pinion, so accurately fitted that even comparatively high powers can be focussed thereby. The fine adjustment consists of a triangular prism upon which slides smoothly a solid metal sleeve in the numbers 1124 and 1127, and of a delicate slide and lever in the other models. The adjustment is obtained by a fine micrometer screw actuating a supplementary pointed rod which impinges upon a hardened steel block, working either direct in Nos. 1124 and 1127 or on a lever in the other models. The limb of the microscope is so designed that there is ample room for the fingers when turning the milled heads. In the larger model instruments, Nos. 1353, 1331, the milled head which is of a larger size is graduated to $\frac{1}{200}$ millimetre for measuring the thickness of cover-glass, etc., and an indicator is attached to the limb of the instrument. In the Regent Model the fine adjustment is obtained with a lever and micrometer screw, which gives a movement four times finer than that of the other models.

The Feature of the Handle model is that the limb can be grasped by the entire hand, and lifting the instrument has no tendency to shift any of the adjustments, see above figure.

The Body tube of the microscope is 140 mm. long with a graduated draw-tube which extends the length of 200 mm.

This is made to slide very smoothly so that it may be used without disturbing the focus of the object glass during observation.

A double mirror on a swinging arm is provided. In the Stands Nos. 1353, 1331 and 1132 a larger size double mirror is supplied. In microscopes Nos. 1325, 1329, an iris diaphragm accompanies each stand. The latter is made with a fitting at the top into which may be fitted a small Abbé form condenser at a cost of **10/0**. The instrument No. 1329 is provided with a spiral focussing and swing-out adjustment. The larger model microscope, No. 1353, has the same substage as No. 1329, the No. 1331 has a complete rack and pinion focussing substage with or without screw centring adjustments, while Nos. 1331 and 1132 have swing-out substages in addition.

The instrument is bright lacquered brass throughout, except the stage, and a very compact polished mahogany cabinet with handle and lock is included in the price of the Stands Nos. 1325 and 1329. A slightly larger cabinet is supplied with Stands Nos. 1353, 1331 and 1132, which allows the instrument to be put away with triple nosepiece and three object glasses *in situ*.

A portable model of the " London " Microscope for travelling is made, see pages 32 and 33.

The 'Pathological.'

(No. 17.)

This Instrument is on the Tripod Base and Pillar Model. It is as rigid and well balanced in the horizontal as in the vertical position. The fine adjustment is by means of a lever actuated by double thread screws which gives two speeds. It is in principle the same as that of the "Imperial" Microscope (see page 5), the speeds are $\frac{1}{60}$ inch and $\frac{1}{300}$ inch for one complete revolution of the milled head. The fine adjustment is so placed that it can be used without raising the wrist from the table. Themechanical stage has a 2 inch motion in the lateral direction, or 3 inch if specially ordered, and 1 inch in the vertical, it is divided and engraved in $\frac{1}{50}$ inch for purposes of "finding." It has complete substage adjustments and a double mirror.

The instrument is bright lacquered brass throughout, except the stage. The draw-tube is the same as that of the "London" Microscope.

The 'Imperial' Microscope.

(Nos. 1101, 1102, 1104, 1105.)

This Instrument has been designed for critical work of the most advanced type. At the same time it is compact and does not stand too high from the table to be comfortably used in a vertical position.

In its complete form it possesses every adjustment that has been usefully applied to a microscope, but it is not necessary to have the instrument fitted with any adjustments that are not desired. In its complete form it is provided with

Coarse Focussing Adjustment.
Double Speed Fine Adjustment with graduated head.
***Full Size Eyepieces.**
***Rack and Pinion Focussing Draw-Tube, graduated.**
***Additional Sliding Draw-Tube, graduated.**
Clamp to Joint.
***Graduated Concentric Rotating Stage.**
***Rack and Pinion Movement to Rotating Stage.**
***Centring Screws to Stage.**
***Graduated Vertical and Horizontal Stage Motion.**
Coarse Focussing Substage Adjustment.
***Fine Focussing Substage Adjustment.**
Centring Substage Adjustment.
Swinging and Sliding Mirror.

*(The adjustments marked * may be omitted at corresponding reduction in price;*

The Stand is made in two models. The English Tripod, Nos. 1101, 1102, or the Continental Base and Pillar, Nos. 1104, 1105. If specially ordered, the tripod is supplied at an extra price of **7/6** with slotted projections to the feet, to allow the stand to be clamped to a table for micro-photography. There is a splay between the front feet of 8½ inches and 9 inches from front to back. A long lever clamp is provided to fix the microscope at any inclination, and the latter is limited in its motion in the exact horizontal and vertical positions.

The Continental Model Stand is unusually large and steady, the base measures 6¾ inches in length by 4½ inches in width, and is provided with a similar clamp to the joint.

The limb of the Microscope is pierced with a square hole and clamp screw, in which illuminators for opaque objects may be held

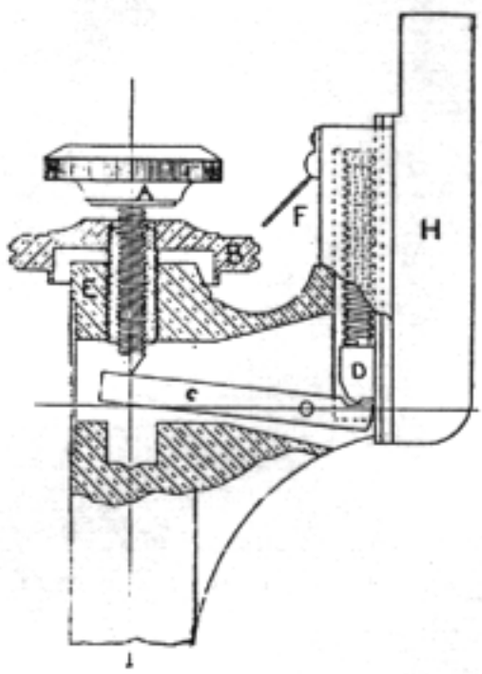
The Body tube of the Microscope is 2 inches in diameter and but 3·6 inches long, though with the nose and draw-tubes in their closed position it measures 5½ inches (140 mm.). The nosepiece and draw-tubes may be removed, and a photographic lens mounted in the centre of this short and large diameter tube allows of the use of a wide-angle for low-power photo-micrographic work.

The draw-tube is provided with a rack and pinion adjustment, and has a ring fitting at its lower extremity which carries the object-glass screw thread.

An additional sliding draw-tube is supplied, and both are graduated in millimetres; a total extension of tube with the two draw-tubes of 260 mm. is obtained.

The diameter of the tube is that of the No. 4 Largest Royal Microscopical Society's standard gauge 1·41 inches, and an adapter is supplied to take the No. 1 size ·917 inch. Low-power and orthoscopic eyepieces may be made of the full size, which give a much larger field of view than can be attained with the small size eyepiece. A small size body with sliding graduated draw-tube with a range of length of 140 mm. to 200 mm. is supplied to the simpler forms of the instrument, Nos. 1102, 1105.

The Coarse Focussing Adjustment is by means of a spiral rack and pinion movement actuated by large milled heads, the slide being a most substantial dove-tail cradle. When at its highest point the nose of the microscope is 4·1 inches from the stage.



The Fine Focussing Adjustment—This is upon a new patented method invented by Mr. Ashe. A strong lever C moves the cradle H, which carries the body of the microscope, by means of the block D, which is a projecting portion of the cradle. The cradle H slides in a fitting in the limb E with a spring acting upon the upper side of the projection D, which drives it on to the lever C. The lever C is moved by a steel screw with milled head A; this screw works through an outer screw which is provided with a large graduated milled head B, read by a folding indicator at F.

The screw A has a comparatively coarse thread, and when revolved raises the body a distance of $\frac{1}{60}$ of an inch in a complete revolution. The screw B has a fine thread, and when revolved carries the screw A with it, moving the body only $\frac{1}{300}$ of an inch in a complete revolution. At any moment either milled head may be used, giving a moderately fine adjustment for such powers as $\frac{1}{4}$ inch or $\frac{1}{6}$ inch, or a very fine movement for $\frac{1}{12}$ inch or $\frac{1}{14}$ inch lens. The convenience of such an arrangement can scarcely be overstated. By clamping the milled head A to the milled head B, or by clamping the milled head B to the limb E by screwing it tightly down, either one or the other fine adjustments may be put out of use.

A slow motion fine enough for focussing the highest powers is most troublesome for moderate power lenses.

The Stage.—In the complete model of the instrument the stage is circular, 5 inches in diameter, with a graduated circle divided in degrees and moved by a rack and pinion which may be thrown out of gear. Centring screws are provided to adjust the centre of rotation. A mechanical rack and pinion top stage works upon its surface by two milled heads having a horizontal motion of $2\frac{1}{2}$ inches and a vertical motion of $1\frac{1}{2}$ inches. This is so designed that during its whole travel it does not come in contact with the substage condenser. Graduated finder divisions are provided to both motions for recording and finding again individual points of an object and for rough measurement purposes. When these are used the centring screws should be unscrewed to their full extent in order that the divisions should always indicate the same position. A folding stop for Maltwood's finder and folding springs are carried by the mechanical stage. Even with the mechanical stage *in situ*, except in its extreme positions of travel, a complete rotation of the stage can be obtained.

The Mechanical Stage can be entirely removed, leaving the stage free for large culture plates or dishes. Spring clips are provided for use with the plain stage.

The simpler models of the instrument are supplied with a large square stage, $4\frac{1}{2}$ inches by $4\frac{1}{2}$ inches, with a removable mechanical stage, having horizontal travel of 3 inches and a vertical travel of $1\frac{1}{8}$ inches.

The Substage is made to the Royal Microscopical Standard size, 1·527 inches. It has coarse adjustment by spiral rack and pinion, and a lever and micrometer screw fine adjustment. It has two centring screws in directions at right angles. The substage itself has no swinging-out motion, but a mount may be supplied carrying the condenser, in which the diaphragms and the optical portion swing out as shown on page 11, No. 917.

The Mirror is flat on one side and concave on the other. It is $2\frac{1}{2}$ inches in diameter and is swung on a fitting which slides up and down a dovetailed bar. This bar is held in the optic axis by a spring stop, but may be swung to one side or the other if desired.

The Binocular.—A special form of the Imperial Microscope is made with a Binocular body, in which the limb of the instrument is somewhat lengthened to give extra length of fitting for the body, or a binocular body interchangeable with the ordinary body may be supplied.

Object Glasses. *See pages 8 and 9.*

Every object glass passes through a rigorous series of tests, and no lens is ever allowed to leave our works if it does not reach the required standard. The higher powers, except where a correction collar is supplied, are adjusted for a cover glass ·006 inch thick with a tube length of 160 mm. The difference between the two series of object glasses depends chiefly on the angular aperture and the presence of the correction collar. All object glasses are made with the standard "Society Screw," will fit any of our microscopes, and are supplied in brass boxes. Many of the powers are so made that they are approximately in focus on a revolving nosepiece. The powers generally preferred for medical work are the $\frac{2}{3}$ inch, the $\frac{1}{6}$ inch or $\frac{1}{8}$ inch, and the $\frac{1}{12}$ or $\frac{1}{14}$ oil immersion. The $\frac{1}{6}$ inch will focus through the thinner of the two cover glasses of the Thoma Hæmacytometer, and can be supplied, without extra cost, with sufficient working distance to focus through the thicker one if specially ordered.

We supply a series of especially wide-angled objectives of moderate and low powers, which have advantages for particular purposes where very high-power eyepieces are to be used.

We supply a series of object glasses specially corrected for Metallurgical work. See Special Catalogue.

Eyepieces. *See pages 8 and 9.*

There is no fixed nomenclature for eyepieces, but those which we call Nos. 1, 1A, 2, 2A, 3, 4 and 5 have magnifying powers respectively of 5, 6½, 8, 12, 15, 20, 25; higher powers can be supplied to order. Nos. 1 (×5), 1A (×6½), 2 (×8), and 2A (×12), are the most useful powers; the No. 3 (×15) is less frequently required, and Nos. 4 (×20) and 5 (×25) are chiefly used for testing lenses.

The Eyepieces for the "London" Microscopes, Nos. 1124, 1325, 1329, 1353, 1331, 1132, 1127 and 17 are made to fit loosely into the Royal Microscopical Society's Standard No. 1 gauge, ·917 inch diameter, and are of the same size as those of Foreign manufacture.

Those for Stands, Nos. 40, 42, 43, 54, 55, 1056 and 1057, fit the Royal Microscopical Society's No. 2 gauge, 1·04 inch diameter. Eyepieces Nos. 1, 1A, 2 and Orthoscopic Eyepieces are made for the Imperial Microscope with the largest Royal Microscopical Society's gauge No. 4, 1·41 inch diameter.

N.B.—Special Eyepieces, such as Micrometer, Erecting, Spectroscope Eyepieces, etc., are described in our Apparatus List.

Price List of Objective Glasses.

Series A.

All object glasses, unless specially ordered, are corrected for the 6½ inch length of tube, and those which possess no correction collar are adjusted for a cover glass $\frac{6}{1000}$" inch thick.

Cat. No.	Focal Length in Millimetres.	English Designation.	Angular Aperture.	Numerical Aperture.	Price. £ s. d.
800	40 mm.	2 inch	7°	0·06·	0 15 0
801A	28 ,,	1½ ,,	15°	0·13	0 15 0
801	22 ,,	1 ,,	18°	0·13	0 12 0
802	16 ,,	$\frac{3}{8}$,,	22°	0·15	0 12 0
802B	16 ,,	$\frac{3}{8}$,,	32°	0·18	0 15 0
802A	12 ,,	$\frac{1}{2}$,,	35°	0·30	1 5 0
803	6 ,,	$\frac{1}{4}$,,	85°	0·68	1 1 0
804	4 ,,	$\frac{1}{6}$,,	90°	0·71	1 10 0
804*	4 ,,	$\frac{1}{6}$,,	110°	0·82	1 10 0
804A	3 ,,	$\frac{1}{8}$,,	90°	0·71	1 10 0
805	3 ,,	$\frac{1}{8}$,,	110°	0·82	2 0 0

Series B.

820	40 mm.	2 inch	8°	0·07	1 0 0
821	30 ,,	1½ ,,	15°	0·13	1 5 0
822	22 ,,	1 ,,	25°	0·16	1 5 0
823	16 ,,	$\frac{3}{8}$,,	32°	0·18	1 5 0
824	12 ,,	$\frac{1}{2}$,,	38°	0·33	1 10 0
825	6 ,,	$\frac{1}{4}$,,	85°	0·68	2 0 0
826	4 ,,	$\frac{1}{6}$,,	110°	0·82	2 15 0
827	3 ,,	$\frac{1}{8}$,,	110°	0·82	3 10 0

Nos. 825, 826 and 827 are provided with correction collars. These are provided with graduations from 0 to 10. If the cover glass in use is $\frac{6}{1000}$ inch thick, the best correction will be obtained when the collar is set to the figure 6, the figures representing in $\frac{1}{1000}$ inch the thickness of the cover glass.

Homogeneous Oil Immersion.

809	2·5 mm.	$\frac{1}{10}$ inch		1·N.A.	3 0 0
810	2 ,,	$\frac{1}{12}$,,		1· ,,	4 0 0
810A	1·8 ,,	$\frac{1}{14}$,,		1· ,,	4 0 0
830	2 ,,	$\frac{1}{12}$,,		1·25 ,,	5 0 0
830A	1·8 ,,	$\frac{1}{14}$,,		1·25 ,,	5 0 0
829	2 ,,	$\frac{1}{12}$,,		1·4 ,,	8 0 0
831	1·5 ,,	$\frac{1}{16}$,,		1·25 ,,	9 0 0
832	1·25 ,,	$\frac{1}{20}$,,		1·25 ,,	12 0 0

A bottle of cedar wood oil is included with each oil immersion object glass.

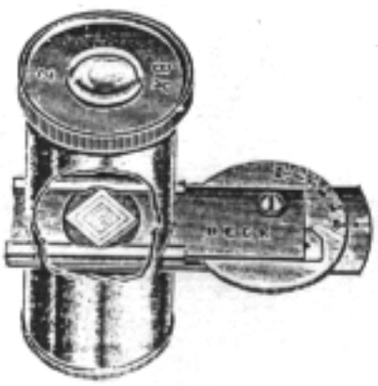
Series C Special Extra Wide-Angle Object Glasses.

840	65·5 mm.	4 inch	9°	0·8	1 10 0
841	59 ,,	3 ,,	12°	0·11	1 10 0
842	40 ,,	2 ,,	17°	0·15	1 10 0
843	28 ,,	1½ ,,	23°	0·2	1 15 0
844	16 ,,	$\frac{3}{8}$,,	32°	0·28	1 15 0
845	8 ,,	$\frac{4}{10}$,,	95°	0·75	3 10 0

N.B.—No. 840, 4 inch, can only be used with a long tube. No. 845 is provided with a correction collar.

HUYGHENIAN EYEPIECES.

To fit Stands, Nos. 40, 42, 43, 54, 55, 1056, 1057, 1127, 1325, 1329, 1353, 1331, 1132, 17, Nos. 1, 1A, 2, 2A, 3, **5/0** each. No. 4 and No. 5 supplied to order only. Price **8/0** each. Eyepieces fitted with Pointers extra **2/6** and **3/6**. Extra Large Eyepieces for the "Imperial" Microscope, (1·41 inch diameter), **15/0** each.



ORTHOSCOPIC or KELNER EYEPIECES
(1·41 in. diameter).

These Eyepieces give an unusually large field, and are useful for searching specimens.

No. 2, ×8. No. 3, ×15. Price **18/0** each.

Projection Eyepieces		2	0 0
No 364E	Ehrlich Eyepiece, No. 1, standard size, with adjustable square aperture, varying from 1 to 8 mm.	1	0 0

Table of Magnifying Powers.

OBJECT GLASS.			APPROXIMATE MAGNIFYING POWER.														
			160 mm. (6½ inch) length of body. EYEPIECES.							Add for each inch (25 mm.) of draw-tube. EYEPIECES.						
Catalogue Number.	Focal Length.	English Designation.	1	1A	2	2A	3	4	5	1	1A	2	2A	3	4	5
SERIES A & B.																
800 820	40 mm.	2 inch	16	20	24	38	50	66	76	3	5	6	8	10	12	16
800A 821	30 mm.	1½ inch	24	32	38	57	74	96	112	5	6	8	10	13	17	19
801 822	22 mm.	1 inch	32	40	48	73	95	120	140	7	8	10	14	17	21	24
802 823	16 mm.	⅔ inch	48	63	72	115	145	185	215	10	12	15	19	24	32	35
802A 824	12 mm.	½ inch	80	110	129	195	250	320	375	13	16	20	28	36	50	54
803 825	6 mm.	¼ inch	150	200	245	375	475	625	715	24	31	37	55	70	88	99
804 804* 826 804A	4 mm.	⅙ inch	220	280	350	530	665	875	1020	34	40	47	75	100	126	135
805 827	3 mm.	⅛ inch	300	400	480	740	940	1200	1450	48	56	75	105	130	170	200
Oil Immerson Lenses.																
809	2·5 mm.	1/10 inch	380	490	570	870	1000	1430	1735	60	80	95	120	160	205	220
810 829 830	2 mm.	1/12 inch	460	590	690	1050	1330	1740	2020	70	90	110	150	180	220	275
810A 830A	1·8 mm.	1/14 inch	540	680	810	1220	1560	2000	2340	80	100	120	170	200	260	310
831	1·5 mm.	1/16 inch	610	770	915	1460	1860	2400	2900	90	110	135	190	230	300	350
832	1·25 mm.	1/20 inch	765	975	1120	1740	2230	2880	3400	140	110	170	240	280	370	440
Series C.																
840	65·5 mm.	4 inch	6	8	10	16	20	26	32	1·5	2	3	4·4	5·5	7	8·5
841	59 ,,	3 inch	9	12	15	23	29	38	49	2	2·8	3·5	5	6·2	8·4	9·5
842	40 ,,	2 inch	16	20	24	38	50	66	76	3	5	6	8	10	12	16
843	28 ,,	1½ inch	24	32	38	57	74	96	112	5	6	8	10	13	17	19
844	16 ,,	⅔ inch	48	63	72	115	145	185	215	10	12	15	19	24	32	35
845	8 ,,	4/10 inch	107	145	173	260	330	425	500	15	20	24	38	48	62	70

The first image in a microscope is formed by the object glass at a point near the focus of the eyepiece, and varies in size according to the distance of the eyepiece from the object glass. This image is magnified by the eyepiece by a fixed amount dependent upon the focal power of the eyepiece.

The magnification of the object glass depends on the length of the tube of the microscope, and can be increased by extending the draw-tube. The tables above give approximately correct powers of the object glasses combined with various eyepieces. As variations occur in individual lenses they cannot be absolutely relied upon for accurate investigations. For convenience it may be remembered as a very rough, though by no means accurate, guide, that a 1-inch object glass with a tube length of 6 inches magnifies in the neighbourhood of 6 times, with a 7-inch tube 7 times, and so on. A ½-inch will give double this magnifying power, a ¼-inch four times, and so on.

The magnification of the Eyepiece is always the same whatever the tube length may be. No. 1 ×5, No. 1A ×6½, No. 2 ×8, No. 2A ×12, No. 3 ×15, No. 4 ×20, No. 5 ×25. By multiplying the power of the object glass by that of the eyepiece the total magnifying power is obtained.

Substage Condensers.

All substages and substage apparatus are made to the R.M.S. Standard Gauge, 1·527 inch.

The Substage Condenser is a system of lenses placed immediately below the object to throw a wide-angle cone of light upon the object under examination (see fig. 1); the most oblique rays of the cone are those which enter the condenser at its margin, and consequently shutting the Iris diaphragm narrows the cone and allows central light only to impinge upon the object. The so-called "Abbé" Condenser is not fully corrected either for chromatic or spherical aberration, and the marginal and central rays of the cone do not meet at the same point. It is useful for ordinary work with high powers, but is not desirable for the formation of Critical Images. The Abbé Dry and Immersion Condenser has no advantage over and gives somewhat less light than the ordinary Abbé Condenser, except when used in immersion contact with the under surface of the slide. The Dry Condenser is made in two sizes, both having the maximum dry angle of 1·N.A. The small size, No. 912A, price **10/0**, fits into the Iris diaphragm, which is supplied with small instruments. The large size, No. 911A, price **35/0**, has an Iris diaphragm and swinging arm to carry a ground glass or blue glass (one

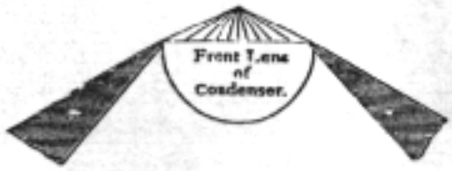
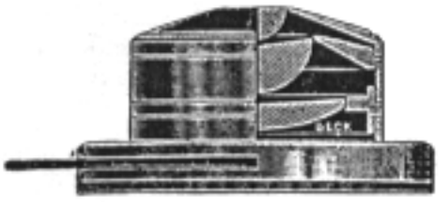


Fig. 1

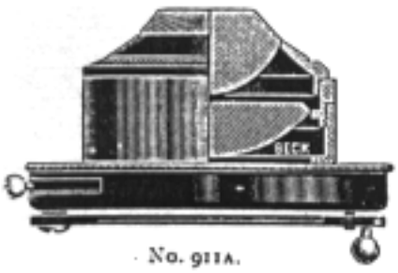
each included). A green glass giving partially mono-chromatic light, or a series of patch stops for cutting out the central rays may be supplied. The accurate centring of the Abbé Condenser is of less moment than is the case with the better corrected instrument, but cross lines may be ruled on the surface of the front lens when supplied with instruments which possess no centring adjustment. The Abbé Condenser is perhaps the most efficient form for dark ground illuminations with central patch stops.

The Beck Achromatic Condenser is made in two forms, the mounting of which is the same, the optical portion only being different. The immersion form has an aperture of about 1·3N.A., the dry form an aperture of 1·N.A., in both cases the whole of the light, with the exception of from 5 to 10 per cent. at the extreme margin, is brought exactly to the same point; it is also accurately corrected for colour. The front lens is removable to form a low-power condenser of fair corrections. The Iris diaphragm is placed at such a distance from the lenses that its image can be focussed upon the object for accurate centring. A swing-out arm to carry coloured glasses or patch stops with a revolving cell is supplied.

Substage Condensers.



No. 910.

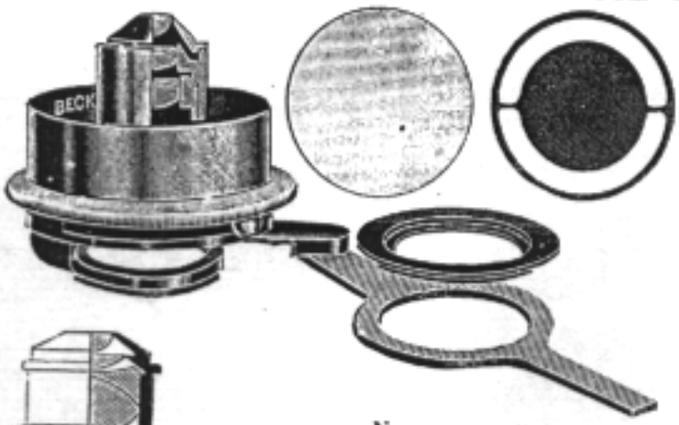


No. 911A.

ABBÉ CONDENSERS.

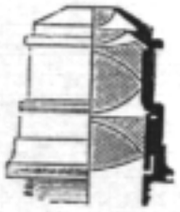
		£	s.	d.
No. 910.	**Abbe Immersion Condenser,** full size lenses, 1·4 N.A. with Iris diaphragm and swinging arm for stops, set of coloured glasses and patch stops.....	3	2	0
No. 911A.	**Abbe Condenser,** full-size lenses, 1·N.A. with Iris diaphragm and swinging arm, one blue and one ground glass disc	1	15	0
No. 911B.	Set of 3 patch stops and spectrum green glass, for 911A in brass box.....	0	12	0
No. 912A.	**Abbe Condenser,** smaller size lenses, 1·N.A. to fit Iris diaphragm supplied with microscopes.....	0	10	0
No. 912.	**Abbe Condenser,** No. 912A, with Iris diaphragm..	0	15	0

THE BECK ACHROMATIC CONDENSERS.



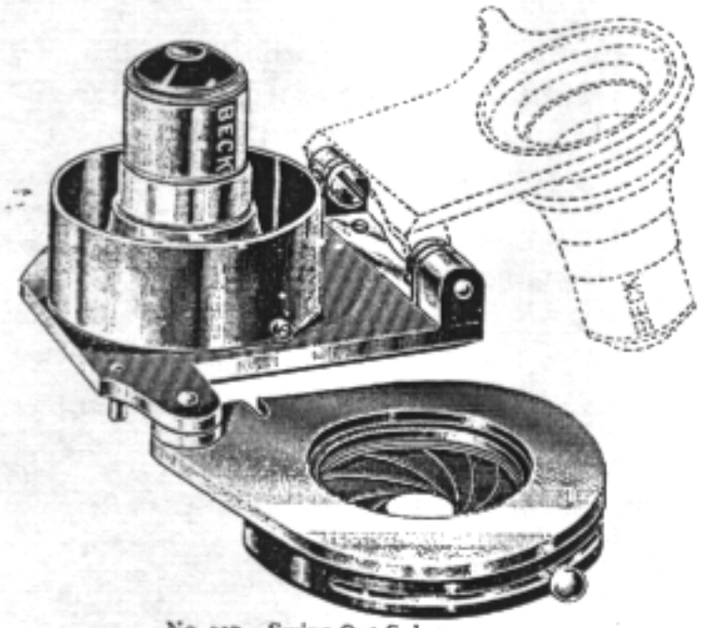
No. 902A.

		£	s.	d.
No. 902A.	**Beck's Achromatic Condenser.** Aperture 1·N.A. Aplanatic Aperture ·9 N.A. with one blue and one ground glass	3	0	0
No. 901.	Optical portion only (Society Standard Screw)	2	0	0
No. 901B.	Fitting only of 902A, with Iris Diaphragm.....	1	0	0
No. 905A.	**Beck's Achromatic Immersion Condenser.** Aperture 1·3 N.A. Aplanatic Aperture 1·3 N.A. with Iris diaphragm, one blue and one ground-glass	3	15	0



No. 905B.

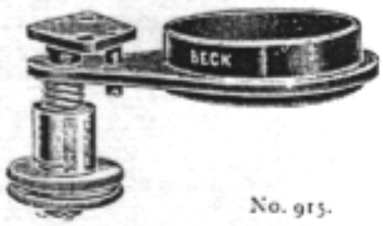
No. 905B.	Optical portion only of 905A (Society Standard Screw).....	2	15	0
No. 905C.	Set of Patch stops and spectrum, green glass in brass box.....	0	12	0



No. 917. Swing-Out Substage.

No. 917. **Swing-Out Adapter for Substage Condensers.** This fitting will take any of our Substage Condensers, the Abbé form being specially mounted for the purpose. It fits into the substage of the microscope and allows the optical portion of the condenser to be swung out without interfering with the focus of the substage. The Iris diaphragm, which also carries a cell for patch stops or coloured glasses, may be used either in connection with the optical portion of the condenser or by itself when the condenser is swung out.

Price in place of ordinary condenser mount extra	£2	0	0
Price separately	3	0	0



No. 915.

No. 915. *Swinging Arm Substage* with Spiral Focussing Adjustment, as supplied to Microscopes Nos. 1329, 1353, 1056.... 0 15 0

This can be fitted to most small microscopes at a small cost. Revolving the milled head raises or lowers substage tube; when it reaches its lowest position a further revolution of the milled head swings the substage out of the optic axis of the instrument.

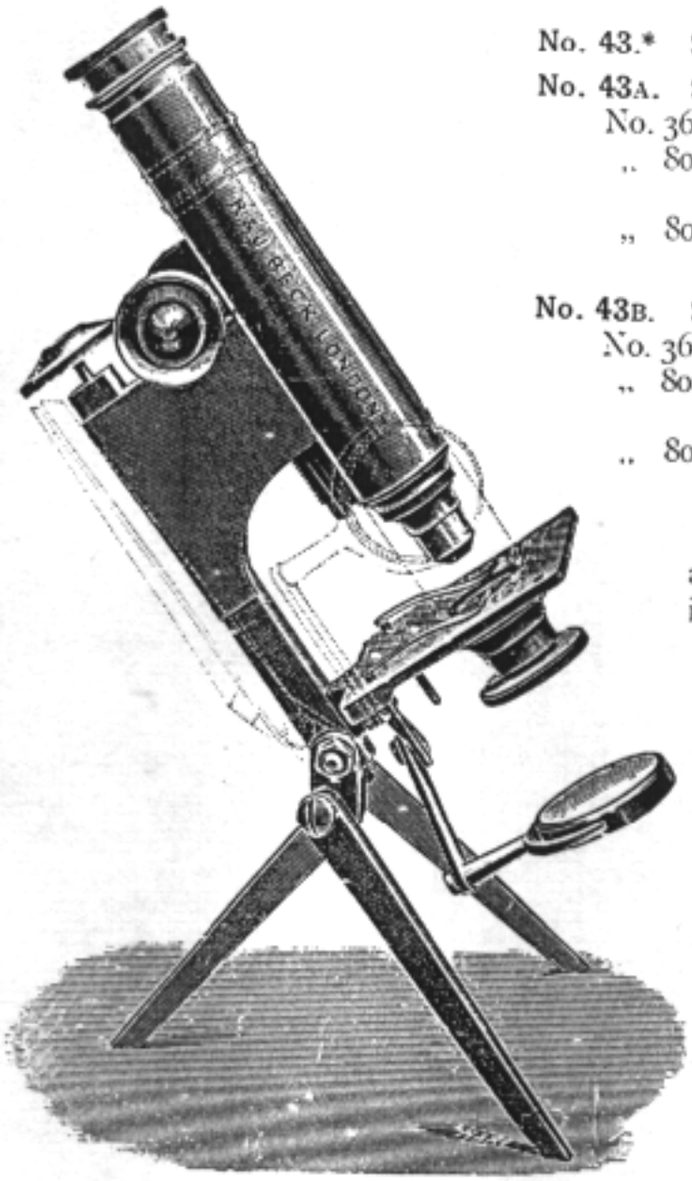
Critical Illumination.

For high-power work, especially with oil immersion lenses, the character of the illumination is of the utmost importance, and a statement of the conditions requisite for the most perfect or so-called "Critical Illumination" may be found useful. The best illuminant (for visual work) is the edge of a flat single-wick paraffin oil lamp. A Nernst Lamp, Gordon Lamp or the Electric Arc may be employed, but daylight, except in the case of the direct rays of the sun, properly guarded, is inadmissible. A mono-chromatic screen should be interposed between the lamp and the microscope. The simplest form is a trough about ¾-inch thick filled with a saturated solution of acetate of copper. This cuts off all the red, yellow and orange light, and is almost as effective as the more elaborate solutions. A Spectrum Green-glass may be used, but is not so satisfactory. The light may be preferably taken direct from the lamp without the use of the mirror, and the microscope inclined so that the optic axis is in a line with the flame. When the mirror is used with the condenser, the plane (never the concave) side should be employed. For critical illumination the Abbé Condenser is of little value—a well-corrected condenser is necessary. The condenser must first be centred. The object glass being in focus on the object and the light thrown upon it through the condenser, the Iris diaphragm should be closed to the smallest aperture and the condenser racked downwards out of focus till an image of the diaphragm is projected upon the object and is seen through the microscope. This may now be centred by means of the substage centring screws, the centring should be re-adjusted for every object glass. If a difficulty is at first experienced in carrying out this process of centring with the highest power object glasses, it is well to accustom oneself to the process with moderate or low powers. The centring having been accomplished, the Iris diaphragm should be opened and the condenser focussed up to the slide until an image of the edge of the lamp flame is superimposed, as a band of light in the centre of the field over the object. The best position for the condenser has been now obtained, and if the condenser is well corrected the back of the object glass, upon removing the eyepiece, will appear equally filled with light. The only adjustment that is now permissible is closing the diaphragm of the condenser till about ¾ of the back lens of the object glass is filled with light. Experts are of opinion that a good objective will perform best when from ¾ to ⅞ of its aperture is filled with light. Turning the lamp flame round so as to illuminate the whole of the field is sometimes convenient, though the latter is not recommended for the most critical work. The Iris diaphragm of the condenser should be used with large aperture as explained above, and any excess of light reduced by a more opaque mono-chromatic screen. Images formed with a small aperture in the condenser are generally to be mistrusted. It is also a great mistake to use a stronger light than is necessary.

The above method is generally accepted by experts as being the best for obtaining the utmost resolving power from a high-power object glass. For ordinary investigation it is not required, but the focussing and centring of the condenser should be carefully adjusted in all difficult research.

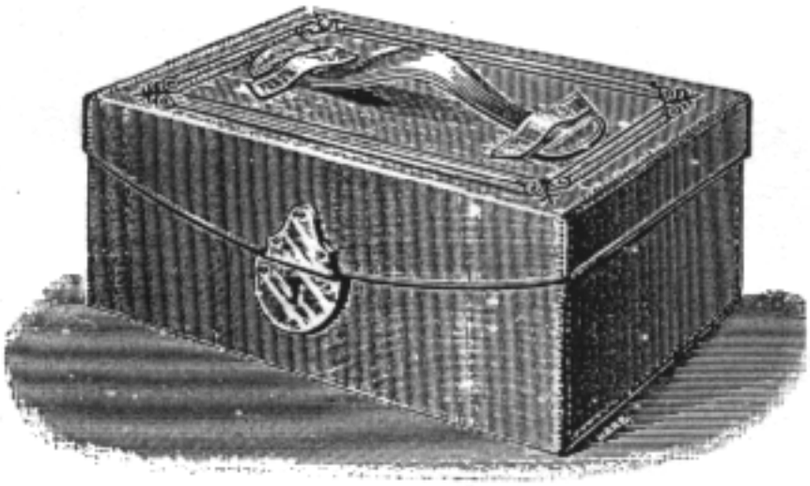
Stand No. 43.

The Portable Star Microscope has rack and pinion coarse adjustment, fine adjustment by micrometer screw, folding tripod base, with joint for inclination; draw-tube, double mirror and Iris diaphragm; it is packed in a leather or walnut case, measuring about 6½ in. ×4¼ in. ×3¼ in.



No. 43.*	**STAND ONLY** in case				**£3 10 0**
No. 43A.	**Stand only**	**£3**	**10**	**0**	
No. 364.	2 Eyepieces, Nos. I. and II.	**0**	**10**	**0**	
„ 801.	1 inch (22 mm.) Object Glass	**0**	**12**	**0**	
„ 803.	¼ inch (6 mm.) do.	**1**	**1**	**0**	
					5 13 0
No. 43B.	**Stand only**	**£3**	**10**	**0**	
No. 364.	2 Eyepieces, Nos. I. and II.	**0**	**10**	**0**	
„ 802.	⅜ inch (16 mm.) Object Glass	**0**	**12**	**0**	
„ 804.	⅛ inch (4 mm.) do.	**1**	**10**	**0**	
					6 2 0

It can be provided with a mechanical stage and focussing substage at an extra price of **£5,** incindlug a condenser.

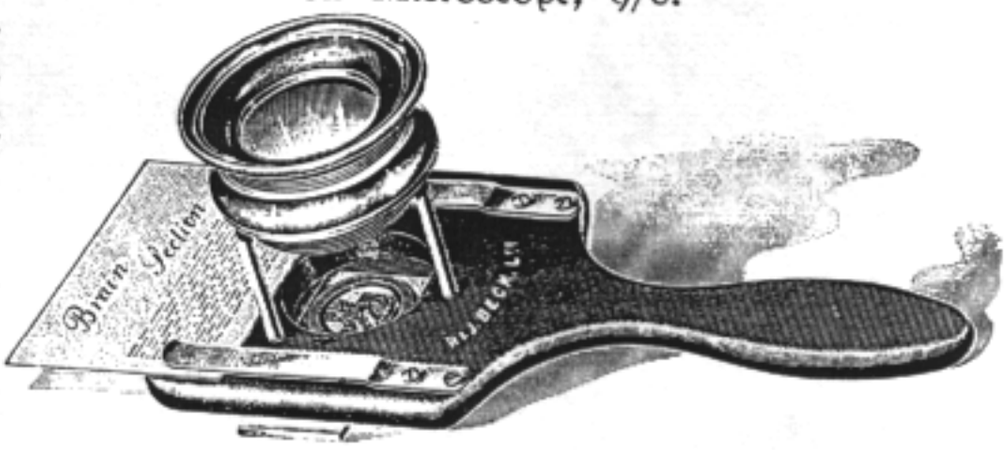


No. 43. Portable 'Star' Microscope.

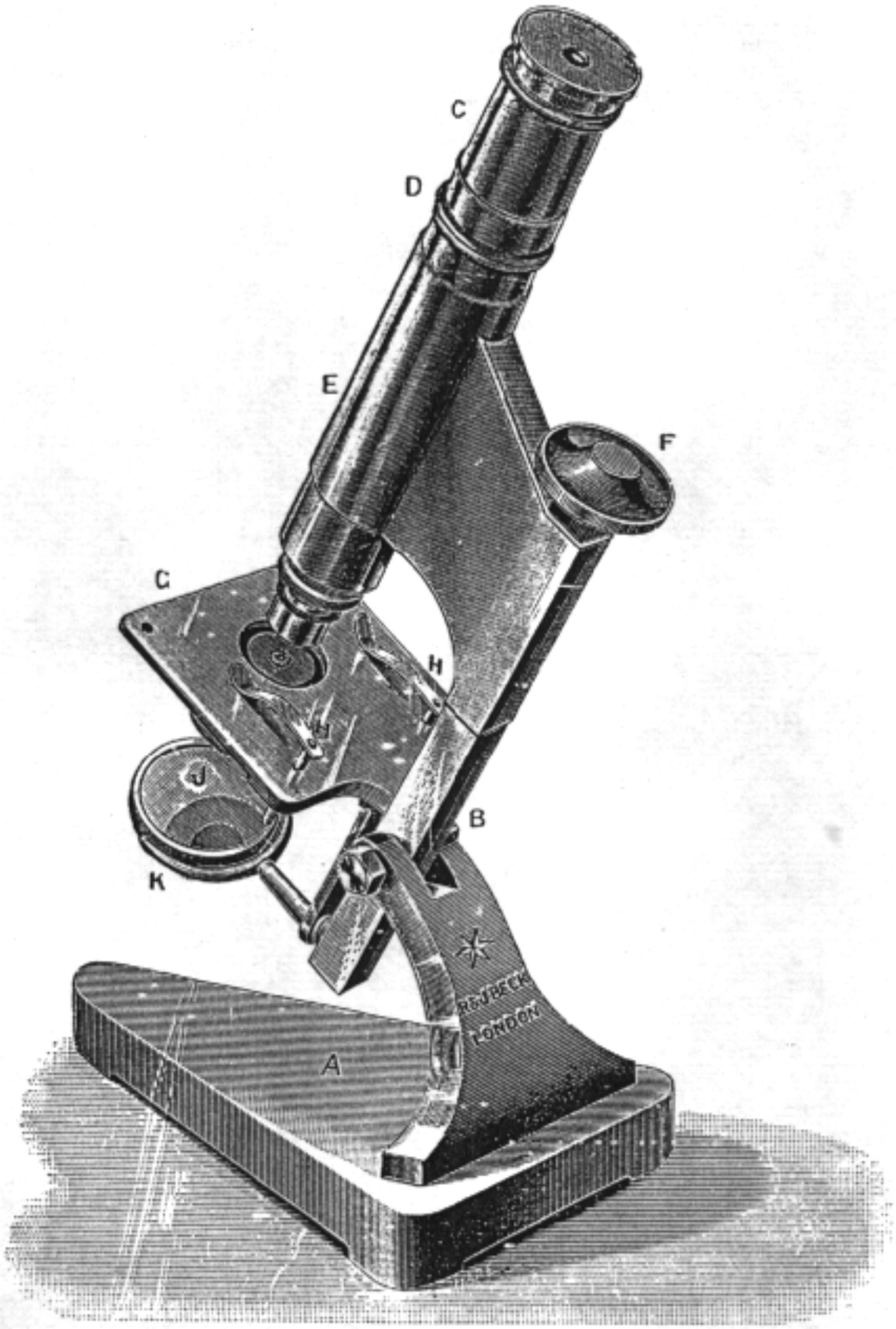
Beck's Hand Demonstration Microscope, 9/6.

This instrument is specially suitable for Lecture Classes and Demonstrations with mounted specimens, and for examining unmounted specimens laid upon a table.

The Plate of Vulcanite which forms the basis of the instrument has clips on both sides, the upper ones for holding a descriptive card, the lower ones for holding the specimens.



The Lens, which magnifies about ×7 diameters, and has a large field, is mounted in a screw jacket which gives a large range of focussing motion.



No. 40. The 'Star' Microscope.

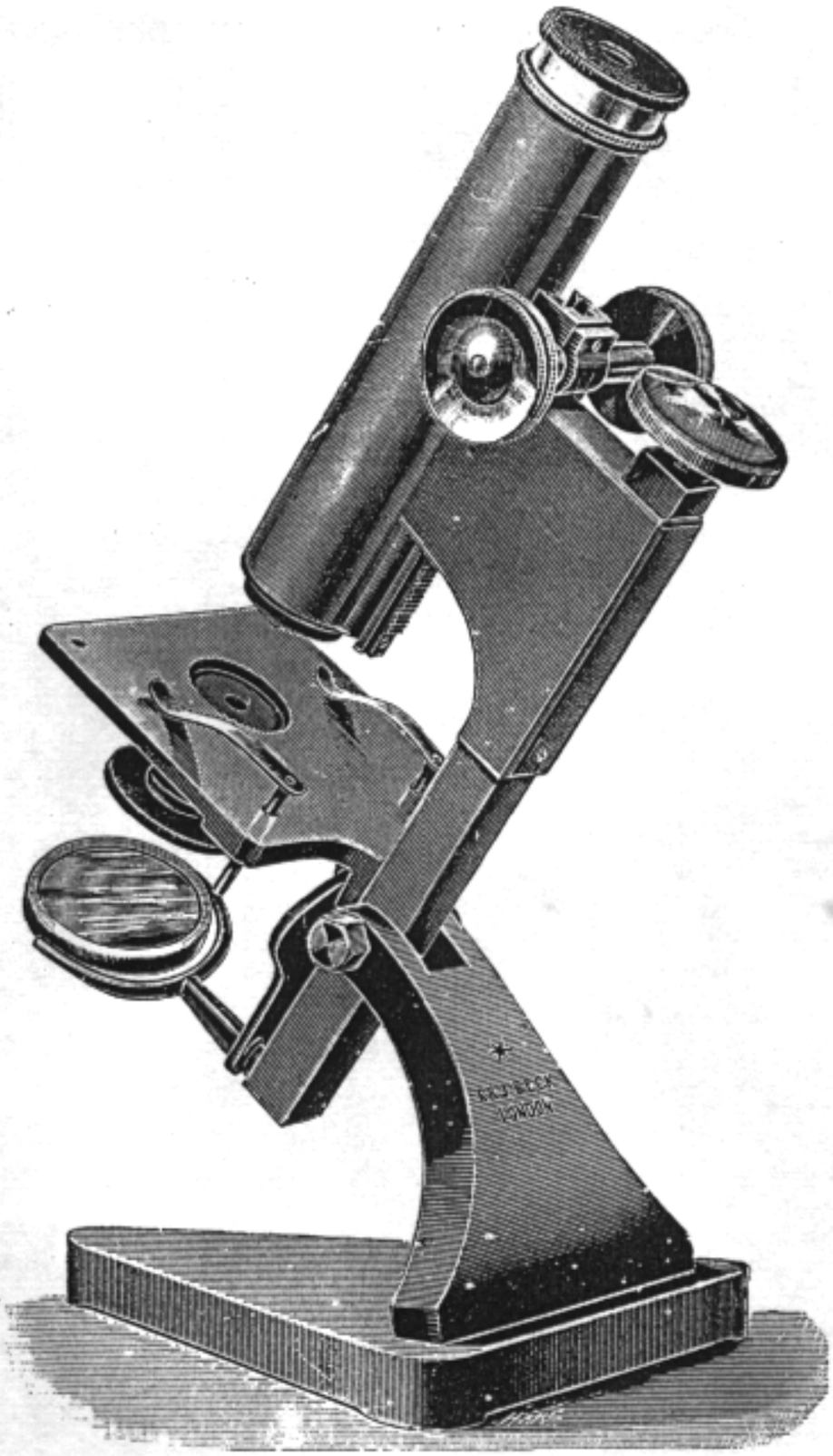
(With sliding coarse adjustment).

Stand No. 40.

This Instrument has joint for inclination ; sliding coarse adjustment ; fine adjustment by micrometer screw, draw-tube, double mirror on swinging arm and iris diaphragm.

		£ s. d.
No. 40.	STAND ONLY, no Object Glasses, no Eyepieces, in Wooden Box ..	**1 8 0**
No. 40F.	Stand as above £1 8 0	
	No. 364. 1 Eyepiece, No. 1 .. .. 0 5 0	
		1 13 0
No. 40G.	Stand as above £1 8 0	
	No. 364. 1 Eyepiece, No. I. 0 5 0	
	,, 801. 1 inch (22 mm.) Object Glass 0 12 0	
	,, 803. $\frac{1}{4}$ inch (6 mm.) do. 1 1 0	
		3 6 0
	Magnifying Power from 38·5 *to* 183.	
No. 40H.	Stand as above £1 8 0	
	No. 364. 1 Eyepiece, No. I. 0 5 0	
	,, 802. $\frac{2}{3}$ inch (14 mm.) Object Glass 0 12 0	
	,, 804. $\frac{1}{6}$ inch (4 mm.) do. 1 10 0	
		3 15 0
	Magnifying Power from 54 *to* 270.	
No. 40M.	Stand as above £1 8 0	
	No. 364. 2 Eyepieces, Nos. I. and II. 0 10 0	
	,, 802. $\frac{2}{3}$ inch (14 mm.) Object Glass 0 12 0	
	,, 804. $\frac{1}{6}$ inch (4 mm.) do. 1 10 0	
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion Object Glass 4 0 0	
	,, 912A. Abbé Substage Condenser 0 10 0	
		8 10 0
	Magnifying Power from 54 *to* 880.	

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 42. The 'Star' Microscope.

(Rack and pinion coarse adjustment.)

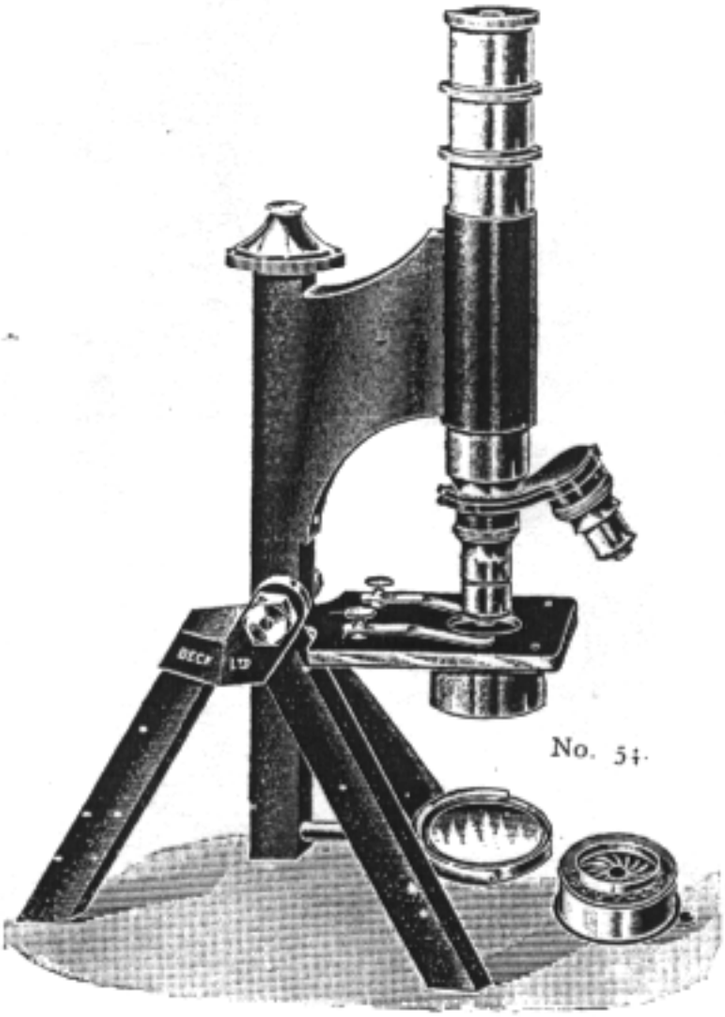
Stand No. 42.

This Instrument has joint for inclination, spiral rack and pinion coarse adjustment; fine adjustment by micrometer screw milled head, draw-tube, double mirror and iris diaphragm.

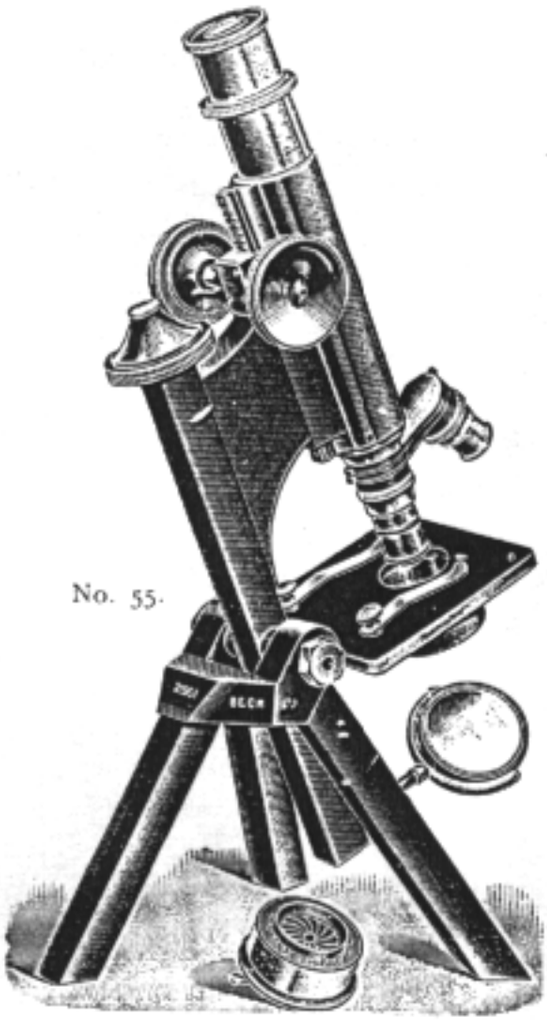
			£ s. d.
No. 42.	**STAND ONLY**, no Object Glass, no Eyepieces, in Wooden Box ..		2 3 0
No. 42F.	**Stand as above**	£2 3 0	
	No. 364. 2 Eyepieces, Nos. I. and II. ..	0 10 0	
		———	2 13 0
No. 42G.	**Stand as above**	£2 3 0	
	No. 364. 2 Eyepieces, Nos. I. and II.	0 10 0	
	,, 801. 1 inch (22 mm.) Object Glass	0 12 0	
	,, 803. ¼ inch (6 mm.) do.	1 1 0	
		———	4 6 0
	Magnifying power from 38·5 to 270.		
No. 42H.	**Stand as above**	£2 3 0	
	No. 364. 2 Eyepieces, Nos. I. and II.	0 10 0	
	,, 802. ⅔ inch (14 mm.) Object Glass	0 12 0	
	,, 804. ⅙ inch (4 mm.) do.	1 10 0	
		———	4 15 0
	Magnifying power from 54 to 400.		
No. 42M.	**Stand as above**	£2 3 0	
	No. 364. 2 Eyepieces, Nos. I. and II.	0 10 0	
	,, 802. ⅔ inch (14 mm.) Object Glass	0 12 0	
	,, 804. ⅙ inch (4 mm.) do.	1 10 0	
	,, 810A. 1/10 inch (2·5 mm.) Oil Immersion Object Glass	3 0 0	
	,, 912A. Abbé Substage Condenser	0 10 0	
	,, 192A. Triple Nosepiece	0 17 6	
		———	9 2 6
	Magnifying power from 54 to 880.		

Walnut Case, with Handle and Lock in place of Wooden Box, extra **7/6.**

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 54.



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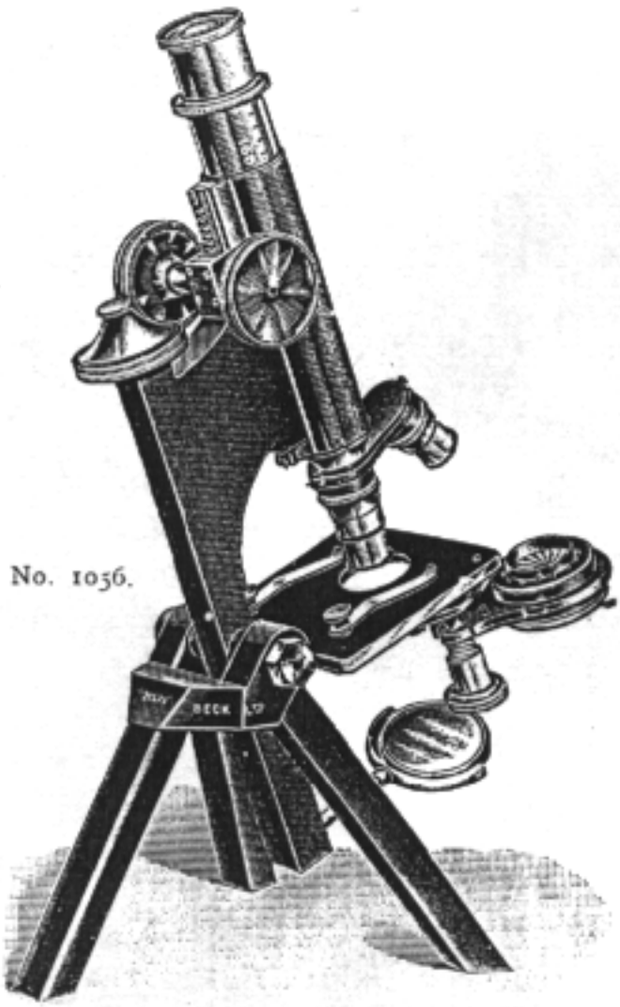
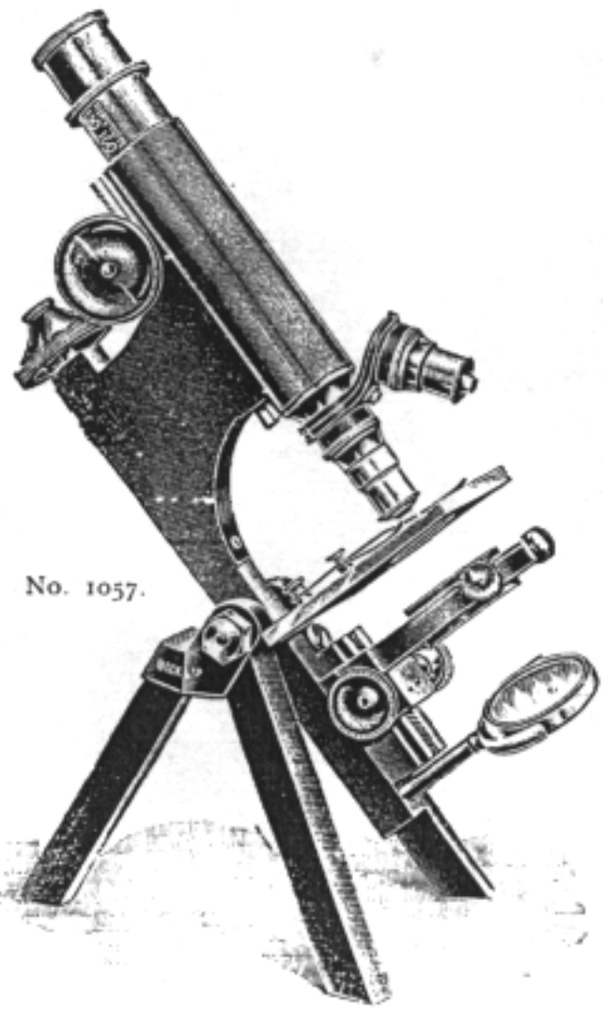


No. 1056.



No. 1057.

'British Students' Microscope.

Stand No. 54.

This Instrument has joint for inclination, sliding coarse adjustment, fine adjustment by micrometer screw, draw-tube, iris diaphragm in sliding fitting, double mirror, on three-legged stand with cork inserted in feet.

	£ s. d.
No. 54. **STAND ONLY,** with Iris Diaphragm, no Object Glasses, no Eyepieces, in Mahogany Case	**2 11 6**

Stand No. 55.

This Instrument is exactly similar to Stand No. 54, but has a spiral rack and pinion coarse adjustment in place of sliding tube adjustment.

No. 55. **STAND ONLY,** with Iris Diaphragm, no Object Glasses, no Eyepieces, in Mahogany Case	**3 12 6**

Stand No. 1056.

This Instrument is the same as No. 55, with the addition of a swing-out spiral focussing substage, and an extra large stage for bacteriological work.

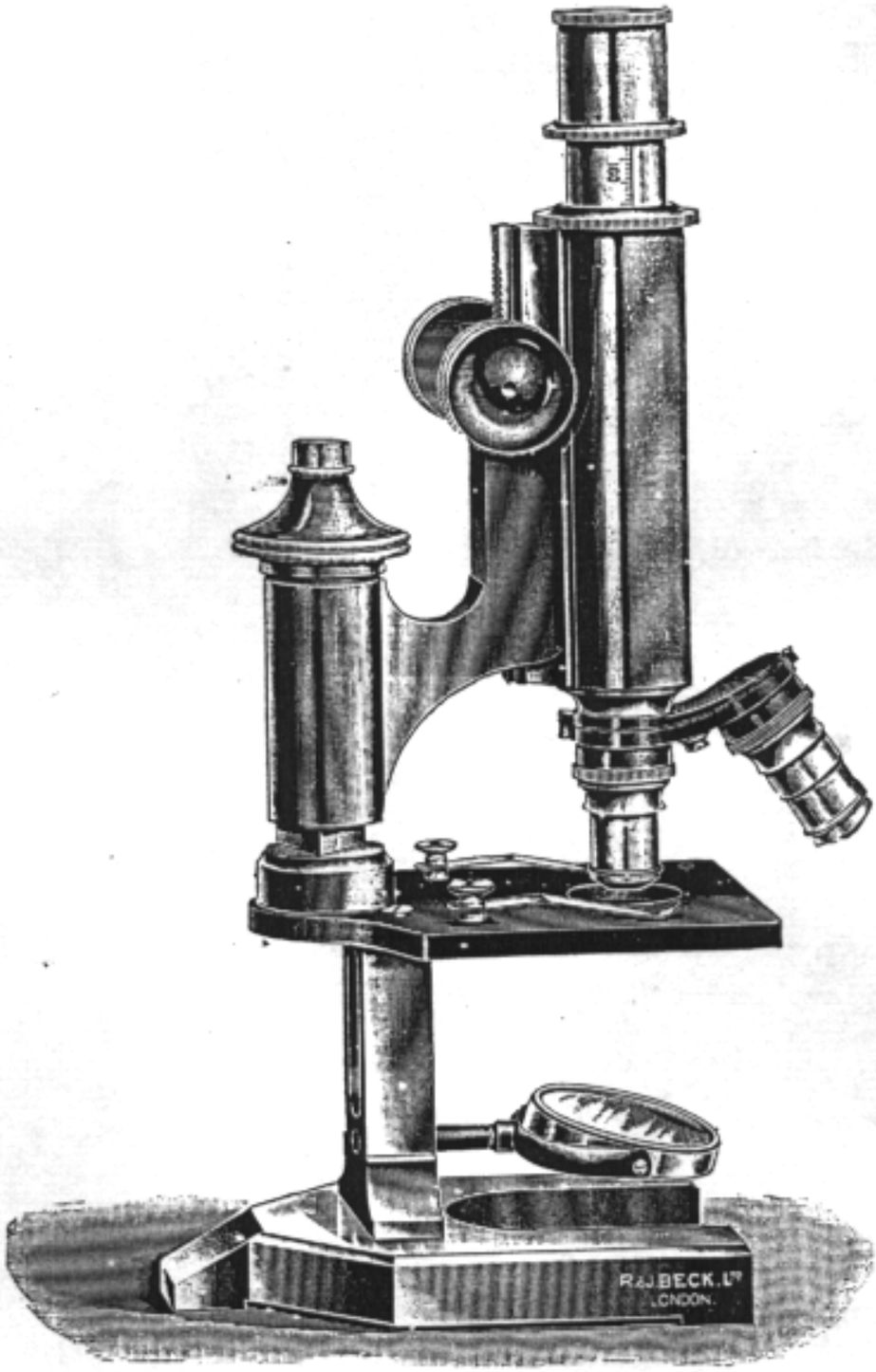
No. 1056. **STAND ONLY,** with Substage and Iris Diaphragm, no Object Glasses, no Eyepieces, in Mahogany Case	**4 12 6**

Stand No. 1057.

This Instrument is the same as Stand No. 1056, fitted with substage, with rack and pinion and centring adjustments in place of swing, and spiral focussing substage.

No. 1057. **STAND ONLY,** with Rack and Pinion and Centring Substage, no Object Glasses, no Eyepieces, in Mahogany Case	**5 17 6**

Any Object Glasses or Apparatus may be included at a corresponding increase in price.



No. 1124. The 'London' Microscope.

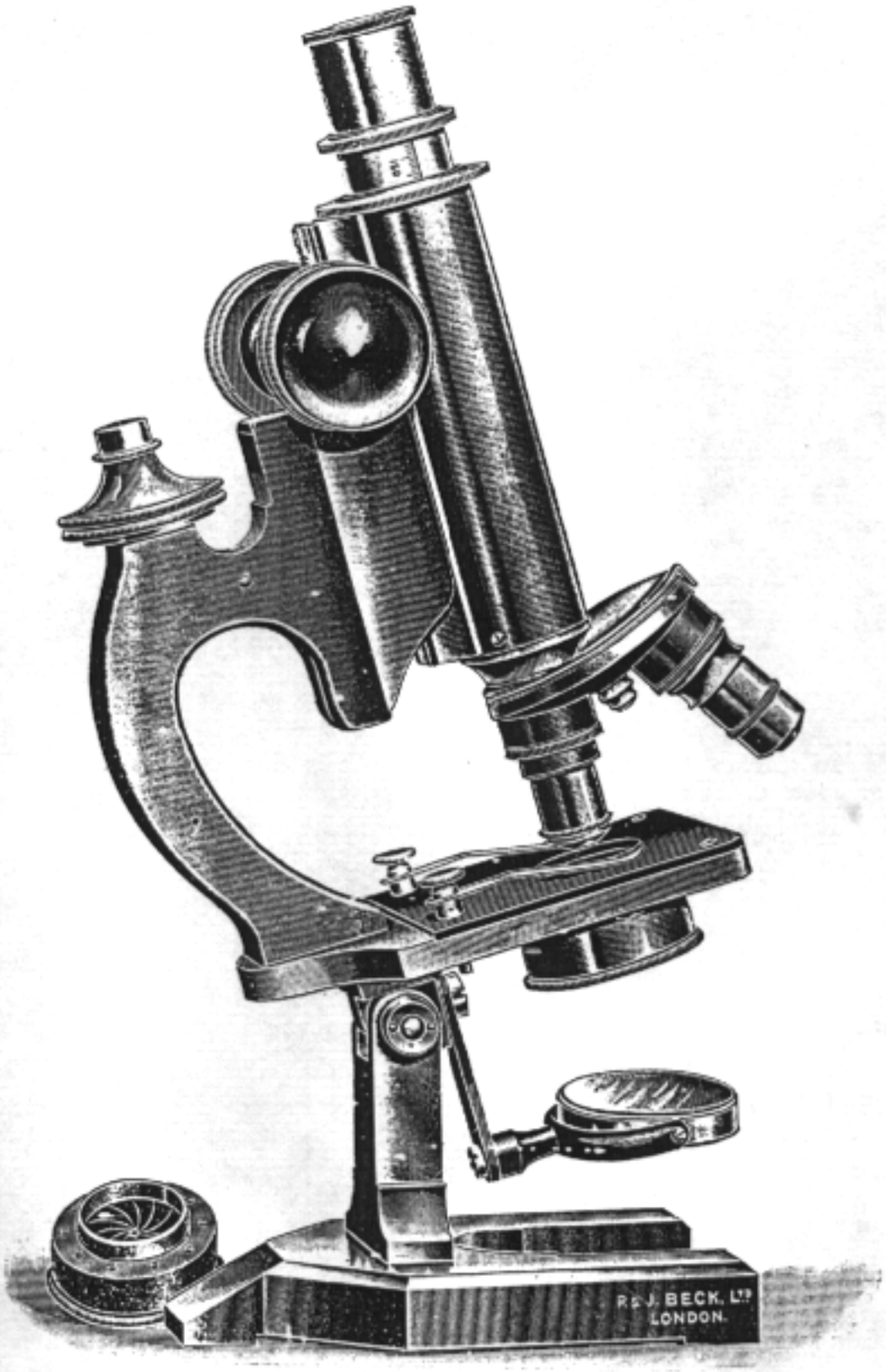
(Vertical Model.)

Stand No. 1124.

Spiral Rack and Pinion, coarse adjustment, micrometer screw fine adjustment, no joint, draw-tube with millimetre scale, double mirror, revolving diaphragm, in polished mahogany case, without lock.

No. 1124.	**STAND ONLY**, in Mahogany Case, with Diaphragm, no Object Glasses, Eyepieces or Nosepiece			**£2 13 0**
No. 1124F.	Stand, in case	**£2 13 0**		
	No. 364A. 2 Eyepieces, Nos. I. and II.	**0 10 0**		
				3 3 0
No. 1124G.	Stand, in case	**£2 13 0**		
	No. 364A. 1 Eyepiece, No. II.	**0 5 0**		
	,, 801. 1 inch (22 mm.) Object Glass	**0 12 0**		
	,, 803. ¼ inch (6 mm.) do.	**1 1 0**		
				4 11 0
	Magnifying power from 59 to 270.			
No. 1124H.	Stand, in case	**£2 13 0**		
	No. 364A. 1 Eyepiece, No. II	**0 5 0**		
	,, 802. ⅔ inch (16 mm.) Object Glass	**0 12 0**		
	,, 804. ⅙ inch (4 mm.) do.) or No. 804A. ⅛ inch (3 mm.) do.)	**1 10 0**		
				5 0 0
	Magnifying power from 82 to 400.			
No. 1124J.	**Microscope** No. 1124H, with Double Nosepiece No. 392A			**5 9 0**
No. 1124N.	Stand, in case	**£2 13 0**		
	No. 364A. 2 Eyepieces, Nos. I. and II.	**0 10 0**		
	,, 802. ⅔ inch (16 mm.) Object Glass	**0 12 0**		
	,, 804. ⅙ inch (4 mm.) do.	**1 10 0**		
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion do. ..	**4 0 0**		
	,, 912. Abbé Condenser, with Iris Diaphragm ..	**0 15 0**		
	,, 915. Swinging Arm, with Spiral Focussing Adjustment	**0 15 0**		
	,, 192A. Dust-tight Triple Nosepiece	**0 17 6**		
				11 12 6
	Magnifying power from 54 to 880.			

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 1325T. The 'London' Microscope.

HANDLE MODEL.

Stand No. 1325. (Handle Model.) 'London' Microscope.

Spiral Rack and Pinion, coarse adjustment, micrometer screw and lever fine adjustment, inclining joint; vulcanite-faced stage; draw-tube with millimetre scale; swinging double mirror; Iris diaphragm; in polished mahogany case.

No. 1325.	**STAND ONLY,** in Mahogany Case, with Iris Diaphragm, no Object Glasses, Eyepieces, or Nosepiece			£3 5 6
No. 1325F.	**Stand,** in case	£3 5 6		
	No. 364A. 2 Eyepieces, Nos. I. and II.	0 10 0		
				3 15 6
No. 1325G.	**Stand,** in case	£3 5 6		
	No. 364A. 1 Eyepiece, No. II.	0 5 0		
	,, 801. 1 inch (22 mm.) Object Glass	0 12 0		
	,, 803. ¼ inch (6 mm.) do.	1 1 0		
				5 3 6
	Magnifying power from 59 *to* 270.			
No. 1325H.	**Stand,** in case	£3 5 6		
	No. 364A. 1 Eyepiece, No. II.	0 5 0		
	,, 802. ⅔ inch (14 mm.) Object Glass	0 12 0		
	,, 804. ⅙ inch (4 mm.) do.			
	or No. 804A. ⅛ inch (3 mm.) do.	1 10 0		
				5 12 6
	Magnifying power from 82 *to* 400.			
No. 1325J.	**Microscope** No. 1325H, with Double Nosepiece No. 392A			6 1 6
No. 1325T.	,, ,, ,, Dust-tight ,, ...			6 7 6
No. 1325N.	**Stand,** in case	£3 5 6		
	No. 364A. 2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 802. ⅔ inch (14 mm.) Object Glass	0 12 0		
	,, 804. ⅙ inch (4 mm.) do.	1 10 0		
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion do. ..	4 0 0		
	,, 912A. Abbé Condenser	0 10 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
				11 5 0
	Magnifying power from 54 *to* 880.			

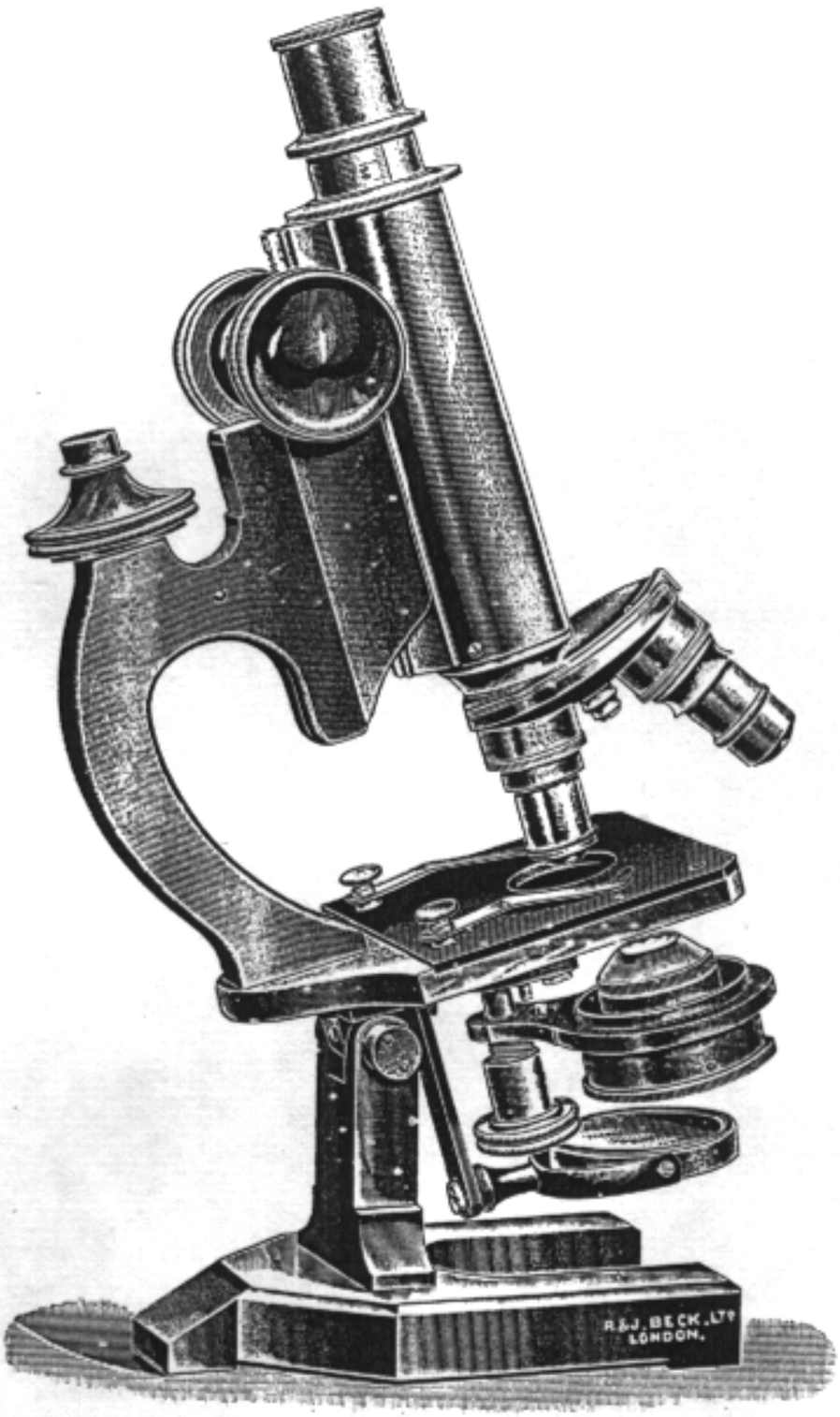
Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.

A larger Case can be supplied, into which the instrument packs, with nosepiece and object glasses, *in situ*, at an extra cost of **3/0.**

BLACK ENAMEL FINISH.

Any of our London Microscopes can be finished in our Black Enamel instead of lacquered brass, if preferred, without extra charge.

This Enamel is of a specially durable composition which resists the action of acid and spirits.



No. 1329. The 'London' Microscope.

HANDLE MODEL.

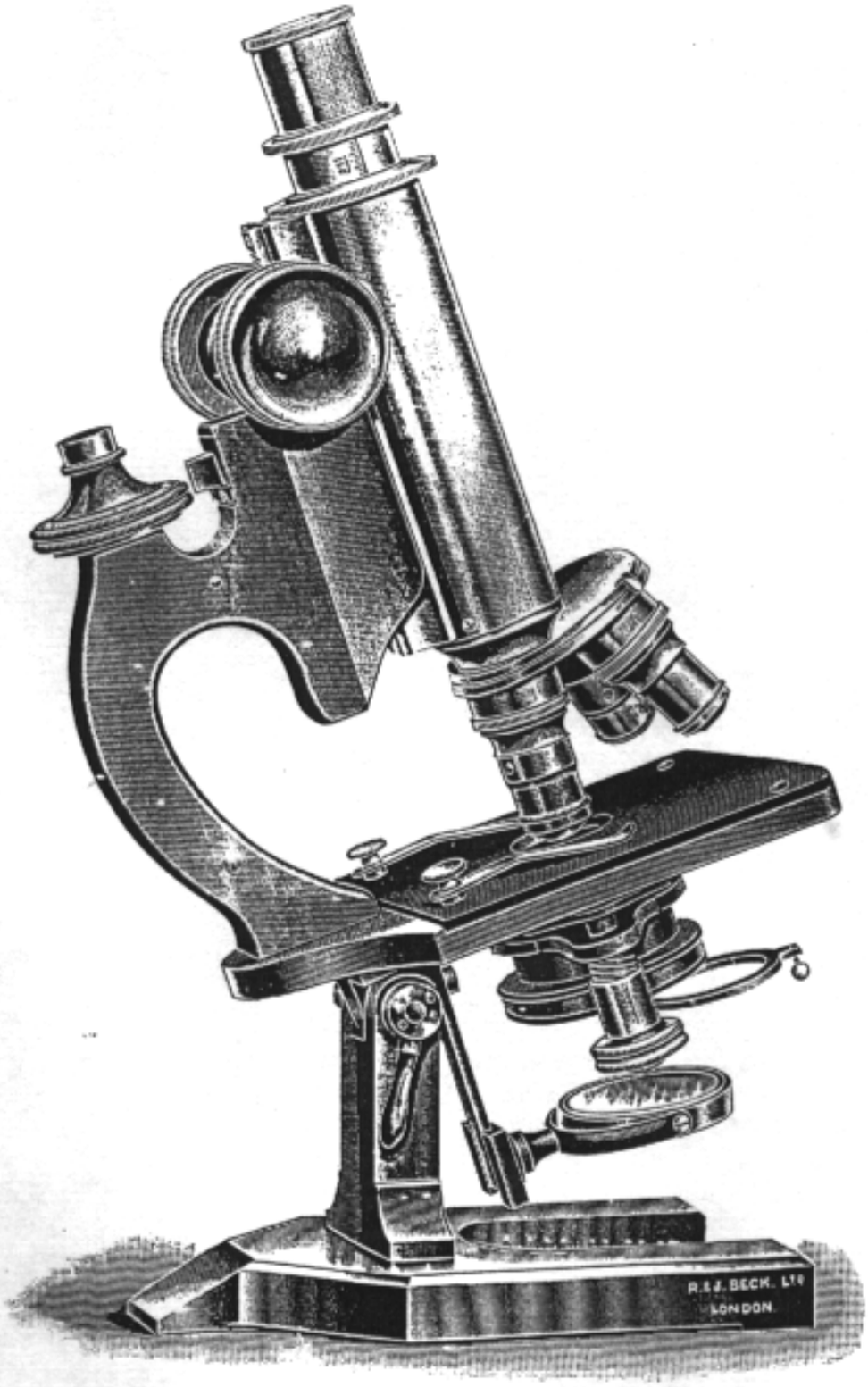
Stand No. 1329. (Handle Model.) 'London' Microscope.

This Instrument is exactly similar to No. 1325, but has a swinging out and spiral focussing substage in place of plain tube fitting.

No. 1329.	STAND ONLY, with Iris diaphragm, in Mahogany Case, no object Glasses, Eyepieces or Nosepiece			£4	0 0
No. 1329J.	Stand, in case		£4 0 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 912A.	Abbé Condenser	0 10 0		
	,, 801.	1 inch (22 mm.) Object Glass	0 12 0		
	,, 803.	¼ inch (6 mm.) do.	1 1 0		
			———	6	13 0
		Magnifying Power from 38·5 *to* 270.			
No. 1329K.	Stand, in case		£4 0 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 912A.	Abbé Condenser	0 10 0		
	,, 802.	⅔ inch (16 mm.) Object Glass	0 12 0		
	,, 804.	⅙ inch (4 mm.) do.			
	or No. 804A.	⅛ inch (3 mm.) do.	1 10 0		
	,, 392B.	Dust-tight Double Nosepiece	0 15 0		
			———	7	17 0
		Magnifying Power from 54 *to* 400.			
No. 1329L.	Stand, in case		£4 0 0		
	No. 364A.	3 Eyepieces, Nos. I., II. and III. ..	0 15 0		
	,, 912A.	Abbé Condenser	0 10 0		
	,, 802.	⅔ nich (16 mm.) Object Glass	0 12 0		
	,, 804	⅙ inch (4 mm.) do.	1 10 0		
	,, 810.	$\frac{1}{12}$ inch (2 mm.) Oil Immersion do. ..	4 0 0		
	,, 192A.	Dust-tight Triple Nosepiece	0 17 6		
			———	12	4 6
		Magnifying Power from 38·5 *to* 880.			
No. 1329P.	Stand, in case		£4 0 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 801.	1 inch (22 mm.) Object Glass	0 12 0		
	,, 802A.	½ inch (12 mm.) do.	1 5 0		
	,, 804.	⅙ inch (4 mm.) do.	1 10 0		
	,, 810.	$\frac{1}{12}$ inch (2 mm.) Oil Immersion Object Glass	4 0 0		
	,, 912A.	Abbé Condenser	0 10 0		
	,, 192A.	Dust-tight Triple Nosepiece	0 17 6		
			———	13	4 6
		Magnifying Power from 38·5 *to* 880.			
No. 1329S.	Stand and Apparatus, as No. 1329P, with addition of Mechanicul Stage No. 1191			16	14 6

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.

A larger Case can be supplied, into which the instrument packs, with nosepiece and object glasses, *in situ*, at an extra cost of **3/0.**



No. 1353. The 'London' Microscope.

Large Handle Model.

Stand No. 1353.

This instrument is a larger model of No. 1329. The stage is 4 inches × 4 inches, with Base and Pillar in proportion. It has a clamp to the Inclining Joint, a large divided milled head to the slow motion, with indicator and a sliding adjustment to vary the distance of the mirror from the stage.

No. 1353. **STAND ONLY,** in Mahogany Case; no Object Glasses, Eyepieces, Condenser or Nosepiece **£5 5 0**

No. 1353J. **Stand, in case** **£5 5 0**
No. 364A. 2 Eyepieces, Nos. I. and II. **0 10 0**
„ 801. 1 inch (22 mm.) Object Glass **0 12 0**
„ 803. ¼ inch (6 mm.) do. **1 1 0**
„ 911A. Abbé Condenser, with Iris diaphragm .. **1 15 0**
9 3 0

Magnifying power from 38·5 to 270.

No. 1353K. **Stand, in case** **£5 5 0**
No. 364A. 2 Eyepieces, Nos. I. and II. **0 10 0**
„ 802. ⅔ inch (16 mm.) Object Glass **0 12 0**
„ 804. ⅙ inch (4 mm.) do.
or No. 804A, ⅛ inch (3 mm.) do. **1 10 0**
„ 911A. Abbé Condenser, with Iris diaphragm .. **1 15 0**
„ 392B. Double Nosepiece, dust-tight **0 15 0**
10 7 0

Magnifying power from 54 to 400.

No. 1353M. **Stand, in case** **£5 5 0**
No. 364A. 3 Eyepieces, Nos. I., II. and III. .. **0 15 0**
„ 801. 1 inch (22 mm.) Object Glass **0 12 0**
„ 803. ¼ inch (6 mm.) do. **1 1 0**
„ 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion do. .. **4 0 0**
„ 911A. Abbé Condenser, with Iris diaphragm .. **1 15 0**
„ 192A. Dust-tight Triple Nosepiece **0 17 6**
14 5 6

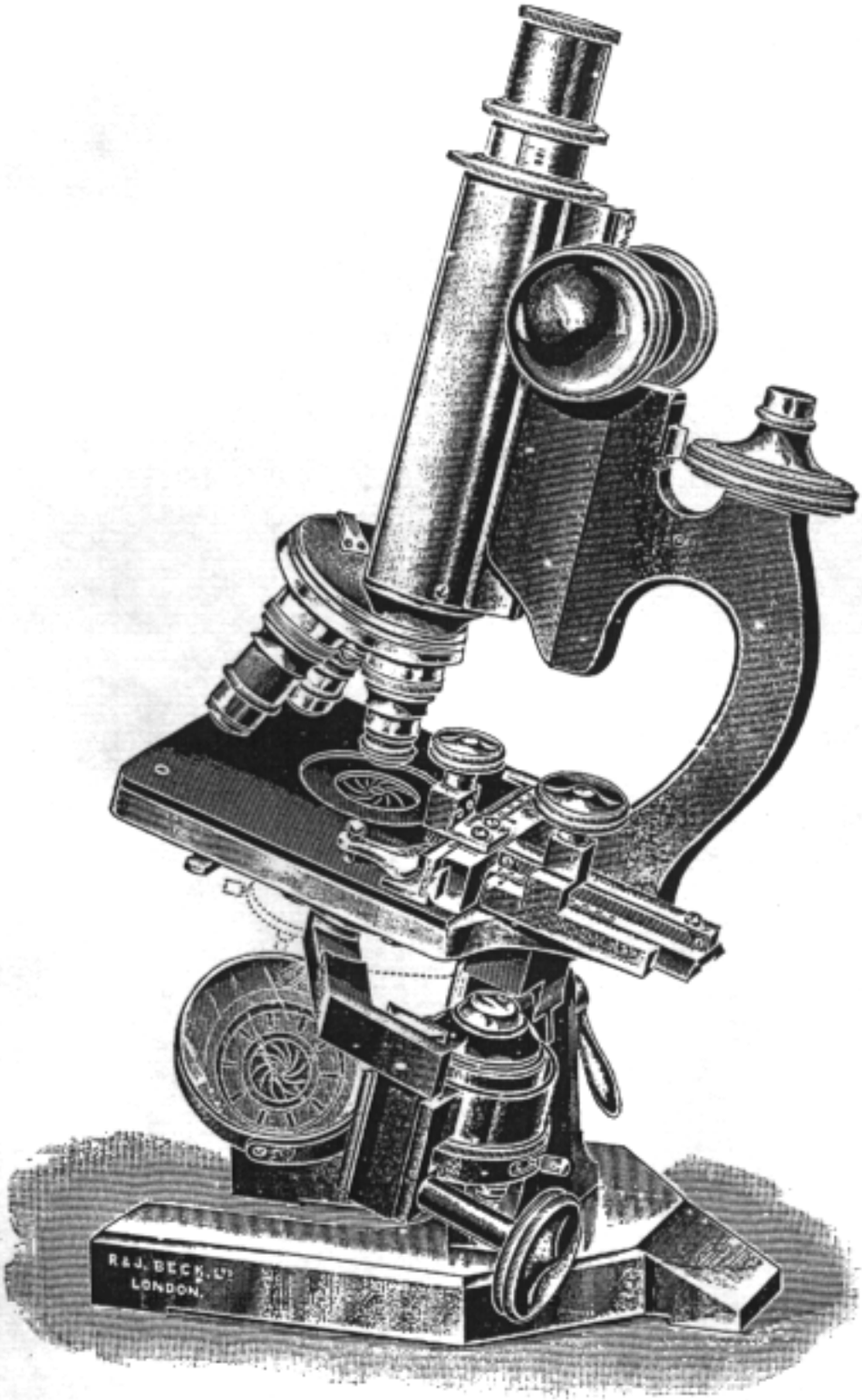
Magnifying power from 38·5 to 1650.

No. 1353N. **Stand, in case** **£5 5 0**
No. 364A. 3 Eyepieces, Nos. I., II. and III. .. **0 15 0**
„ 802. ⅔ inch (16 mm.) Object Glass **0 12 0**
„ 804. ⅙ inch (4 mm.) do. **1 10 0**
„ 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion do. .. **4 0 0**
„ 911A. Abbé Condenser, with Iris diaphragm .. **1 15 0**
„ 192A. Dust-tight Triple Nosepiece **0 17 6**
14 14 6

Magnifying power from 54 to 1650.

No. 1353S. **Stand and Apparatus as No. 1353N, with addition of Mechanical Stage No. 1191** **18 4 6**

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 1331. The 'London' Microscope.

Iris Model.

Stands Nos. 1330 and 1331.

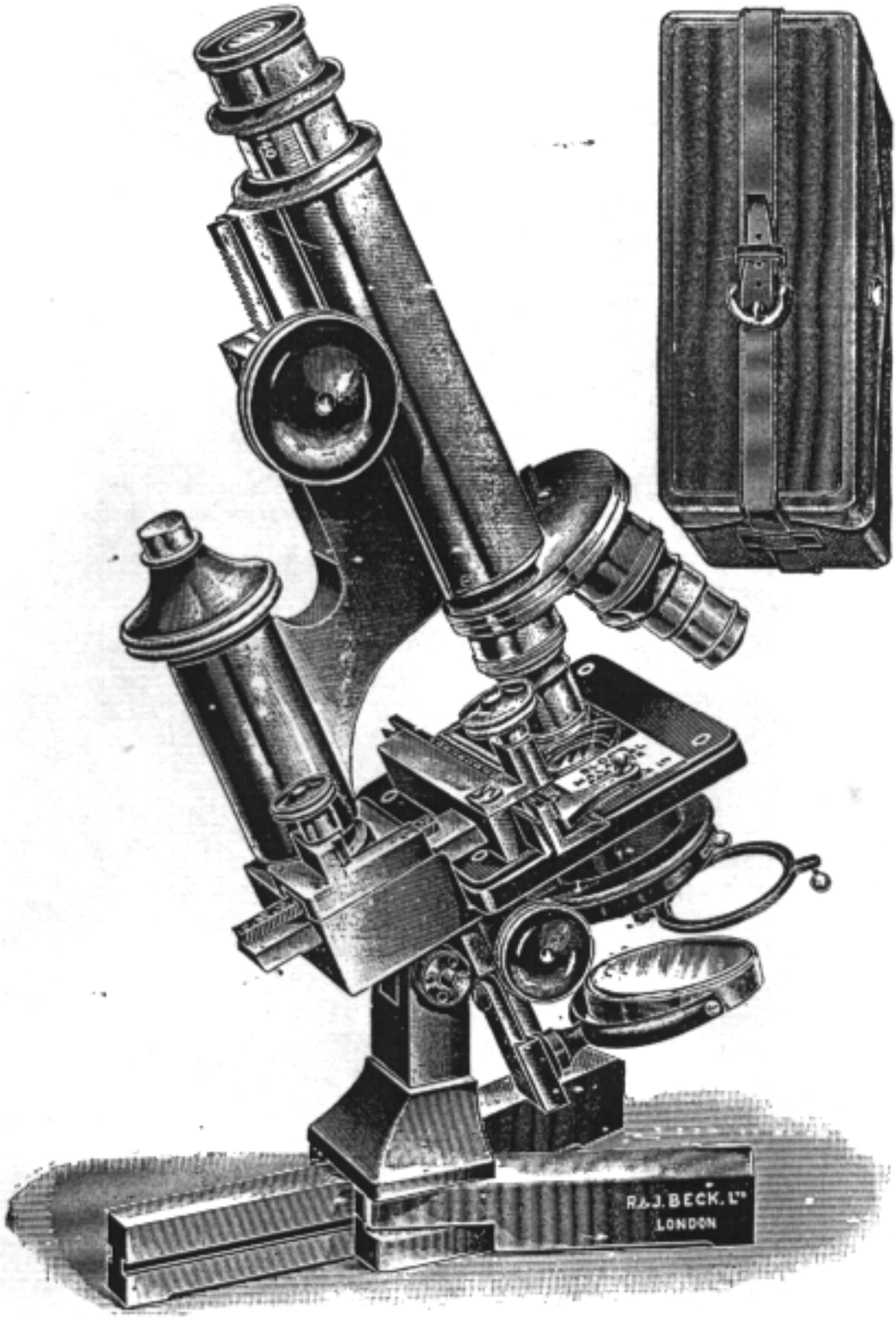
These Instruments are designed upon the larger model of our London Microscopes (No. 1353).

The Substage has rack and pinion focussing motion, but is carried on a very rigid arm, by means of which it can be swung out to one side. Greater distance between the stage and the base is provided to allow more room for the manipulation of the substage and mirror.

An Iris diaphragm is fitted in the stage, which is flush with the surface, and if an Abbé Condenser is in use, can be closed between the top of the condenser and the slide when the former is in focus. No. 1330 has no substage. No. 1331 is complete with substage, and centring adjustment to the substage can be added at a cost of **15/0**.

No. 1330.	**The "London" Iris Model Stand,** without Substage, with Iris Diaphragm in stage, no Object Glasses or Eyepieces, in Mahogany Case ..			£5 0 0
No. 1330J.	**Stand,** in case	£5 0 0		
	No. 364A. 1 Eyepiece, No. I., IA., II., or IIA. ..	0 5 0		
	,, 802B. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804. $\frac{1}{6}$ inch (4 mm.) Object Glass	1 10 0		
	,, 392B. Double Nosepiece, dust-tight	0 15 0		
			8 5 0	
No. 1331.	**The "London" Iris Model Stand** with Rack and Pinion, Swing-out Substage, complete, no Eyepieces or Object Glasses, in Case ..		6 10 0	
No. 1331J.	**Stand,** in case	£6 10 0		
	No. 364A. 2 Eyepieces	0 10 0		
	,, 802B. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804. $\frac{1}{6}$ inch (4 mm.) Object Glass	1 10 0		
	,, 912. Abbé Condenser with Iris Diaphragm ..	0 15 0		
	,, 392B. Double Nosepiece, dust-tight	0 15 0		
			10 15 0	
No. 1331JS.	**Stand and Apparatus, No. 1331J.**	£10 15 0		
	No. 1191A. Mechanical Stage	3 10 0		
			14 5 0	
No. 1331N.	**Stand,** in case	£6 10 0		
	No. 364A. 2 Eyepieces	0 10 0		
	,, 802B. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804. $\frac{1}{6}$ inch (4 mm.) Object Glass	1 10 0		
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion	4 0 0		
	,, 912A. Large Abbé Condenser	1 15 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
			15 17 6	
No. 1331NS.	**Stand and Apparatus, No. 1331N.**	£15 17 6		
	No. 1191A. Mechanical Stage	3 10 0		
			19 7 6	
No. 1331PS.	**Stand,** in case	£6 10 0		
	Centring Adjustment to Substage ..	0 15 0		
	,, 364A. 3 Eyepieces	0 15 0		
	,, 802B. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804. $\frac{1}{6}$ inch (4 mm.) Object Glass	1 10 0		
	,, 830. $\frac{1}{12}$ inch (2 mm.) Oil Immersion Object Glass, 1·25 NA.	5 0 0		
	,, 902A. Beck Achromatic Condenser	3 0 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
	,, 1191. Mechanical Stage	3 10 0		
			22 12 6	

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 1127. The 'London' Microscope.

Portable Model.

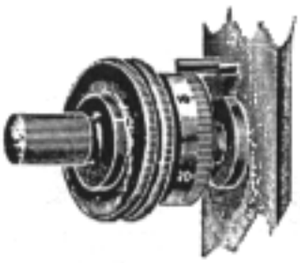
Stand No. 1127.

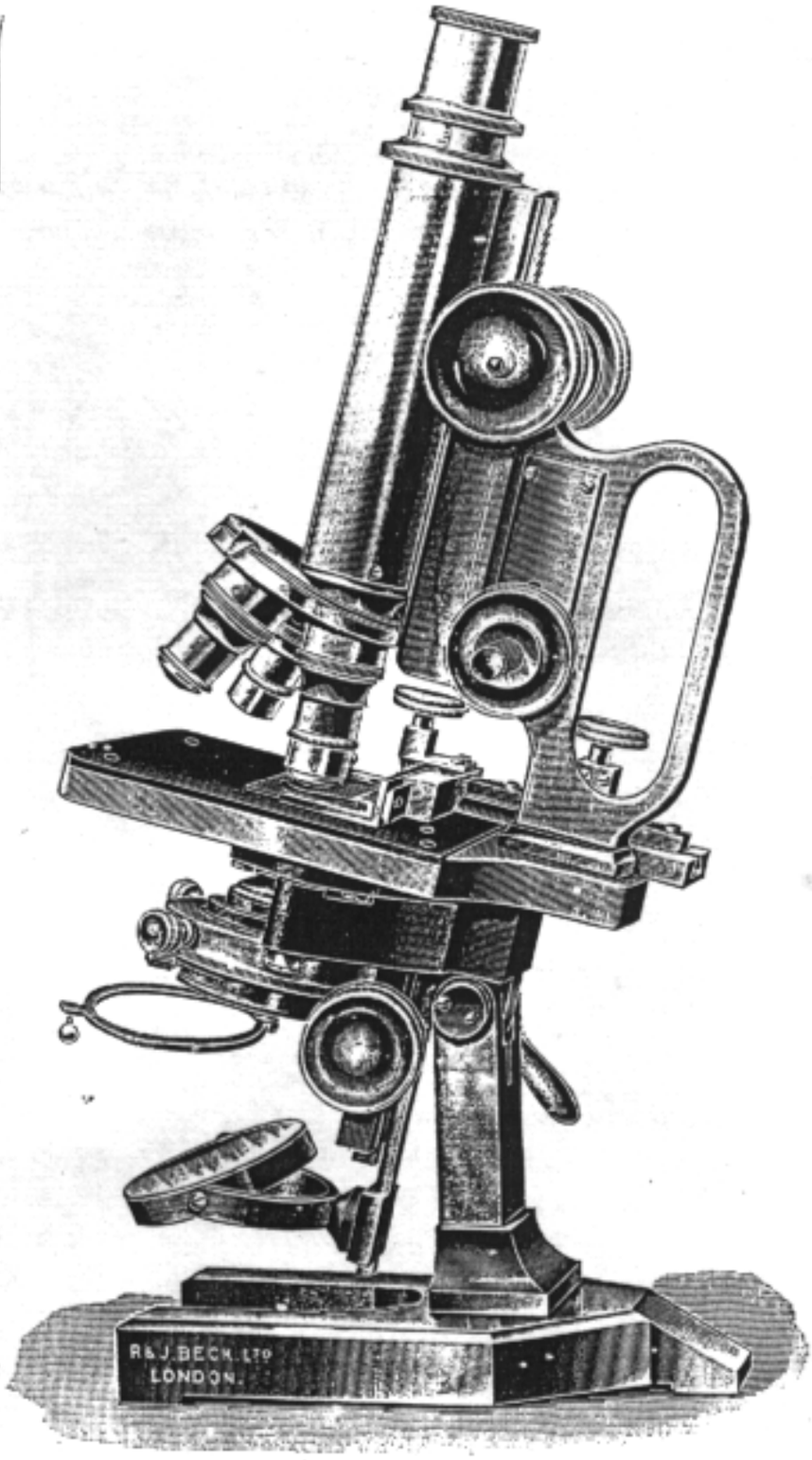
This modification of our " London " Microscope has been designed to meet the demand for a portable microscope, which should be absolutely first-class and have all adjustments for delicate high-power research.

It has inclining joint, first-class fine and coarse adjustments, a divided draw-tube, removable mechanical stage, giving 2-inch horizontal and 1-inch vertical movements, with graduated finder divisions, rack and pinion focussing substage, ebonite top stage, double mirror, and is absolutely rigid. The back leg of the base slides in, the side legs close up, the stage and mechanical stage both remove and pack in the bottom of the case, and the triple nosepiece swings round. The leather case measures about $2\frac{1}{4}$ in. × $4\frac{1}{2}$ in. × $9\frac{1}{2}$ in. The mahogany case measures $3\frac{1}{4}$ in. × $5\frac{1}{2}$ in. × 11 in., both will hold 3 object glasses, 2 eyepieces and oil bottle.

It is supplied in a mahogany case with handle and lock at the same price. For hot climates brass screwing throughout, at a cost of **5/-** extra, is recommended. At an extra cost of **£1 5 0** this case may be supplied with sunk brass bindings along all the corners.

No. 1127.	**Stand only, in leather or mahogany case, with Mechanical Stage .. .. ..





No. 1132. The 'London' Microscope.

Regent Model.

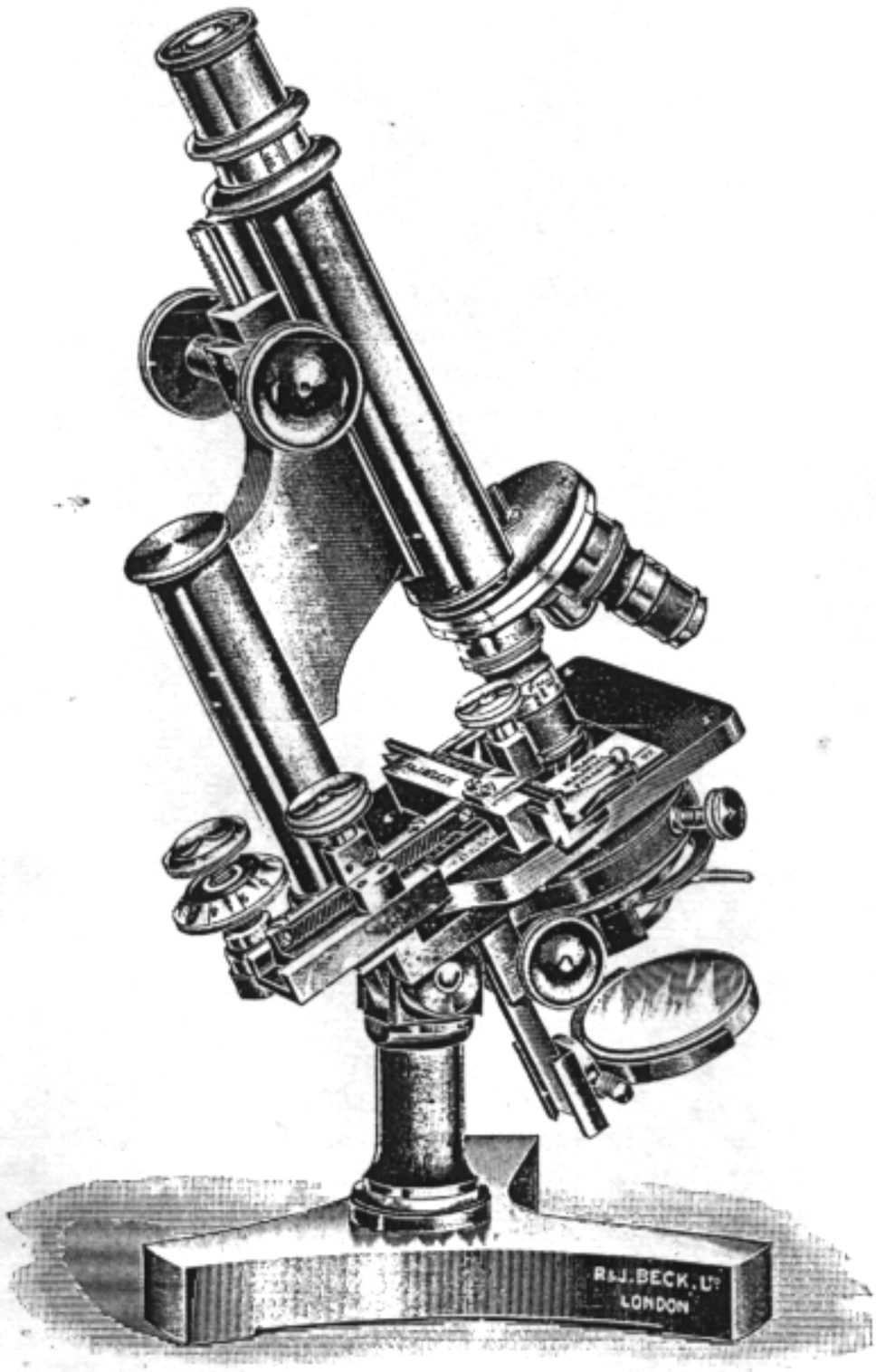
Stand No. 1132.

This Instrument is a further improvement upon the Iris model of the London Microscope. The fine adjustment is of more sensitive pattern and four times more delicate in its adjustment than that of the 1331 model, each division of the drum representing 1/100,000th of an inch. The limb is made with a large aperture, forming a handle through which the entire hand can be passed, and the instrument lifted out without any strain being placed upon the working parts. The instrument is a somewhat larger and more substantial model, and carries a mechanical stage with 3-inch horizontal and 1-inch vertical motions.

No. 1132.	The "London" Regent Model Stand, with Rack and Pinion Substage, with Swing-out Motion and Centring Adjustments, Mechanical Stage, Iris Diaphragm in stage, no Object Glasses, Eyepieces or Condenser in Case			£13 10 0
No. 1132N.	**Stand, in case**	**£13 10 0**		
	No. 364A. 2 Eyepieces	0 10 0		
	,, 802A. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804*. $\frac{1}{6}$ inch (4 mm.) Object Glass, 110° ..	1 10 0		
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion, 1·N.A. ..	4 0 0		
	,, 911. Abbé Condenser with Iris Diaphragm ..	1 15 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
			22 17 6	
No. 1132P.	**Stand, in case**	**£13 10 0**		
	No. 364A. 3 Eyepieces	0 15 0		
	,, 802A. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 804*. $\frac{1}{6}$ inch (4 mm.) Object Glass, 110° ..	1 10 0		
	,, 810. $\frac{1}{12}$ inch (2 mm.) Oil Immersion, 1·25 N.A.	5 0 0		
	,, 902A. Beck Achromatic Condenser, 1·N.A. ..	3 0 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
			25 7 6	
No. 1132R.	**Stand, in case**	**£13 10 0**		
	No. 364A. 5 Eyepieces	1 5 0		
	,, 821. $1\frac{1}{2}$ inch (30 mm.) Object Glass	1 5 0		
	,, 802A. $\frac{2}{3}$ inch (14 mm.) Object Glass, 32° ..	0 15 0		
	,, 845. $\frac{4}{10}$ inch (8 mm.) Object Glass, 95° ..	3 10 0		
	,, 826. $\frac{1}{6}$ inch (4 mm.) Object Glass, 110° ..	2 15 0		
	,, 830. $\frac{1}{12}$ inch (2 mm.) Oil Immersion, 1·25 N.A.	5 0 0		
	,, 902A. Beck Achromatic Condenser, 1·N.A. ..	3 0 0		
	,, 905A. Set of Patch Stops, etc.	0 12 0		
	,, 192A. Dust-tight Triple Nosepiece	0 17 6		
	Nos. 346 & 349B. Stage and Eyepiece Micrometer ..	1 10 0		
	No. 340. Beck's Vertical Camera Lucida	0 18 0		
			34 17 6	

Any object Glass or Apparatus may be included or omitted at a corresponding increase or reduction in price.

The Stand can be supplied without the Mechanical Stage at a reduction of **£3 10s.**



No. 17. Pathological Microscope.

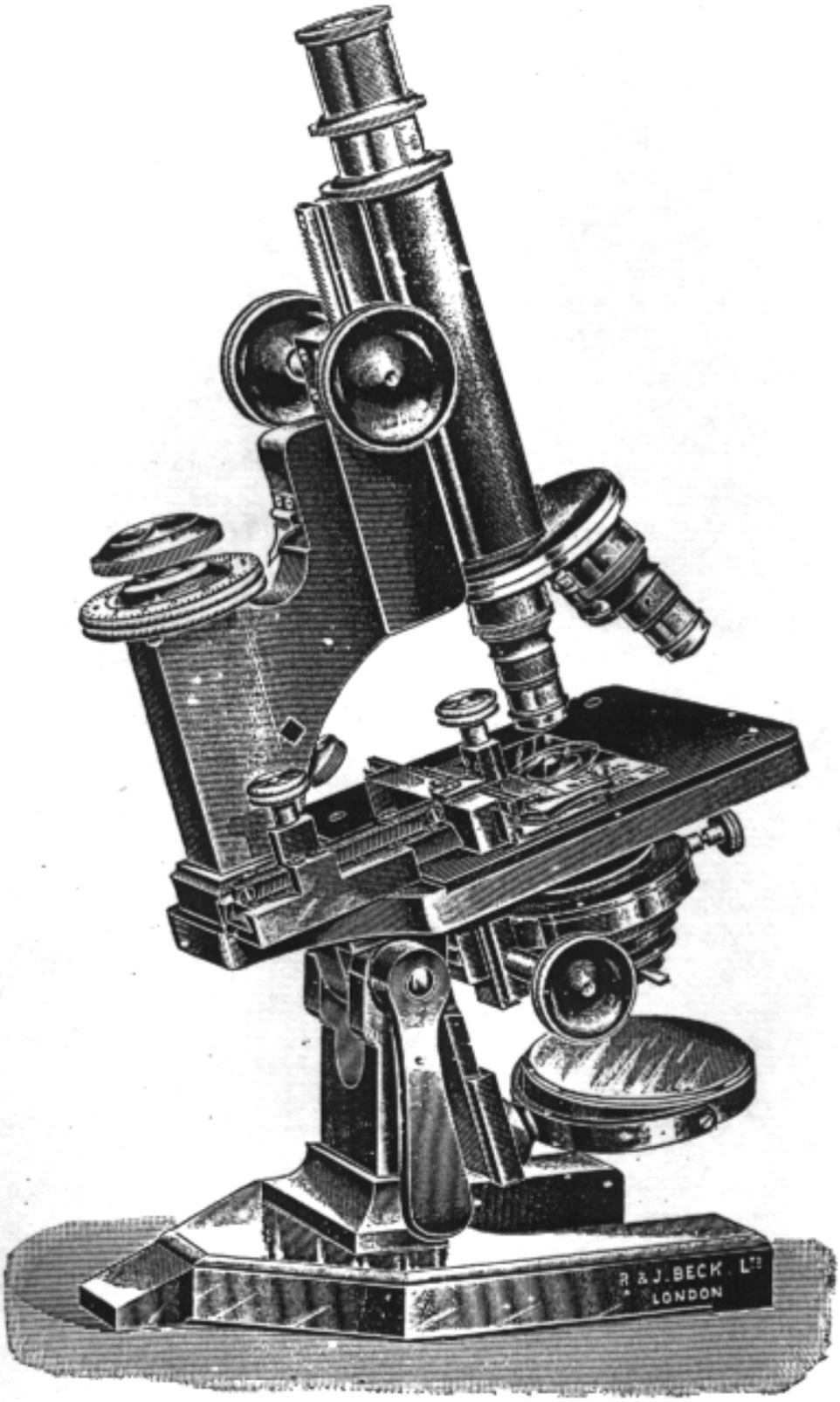
Stand No. 17.

(*Described page 4*).

This Instrument has spiral rack and pinion coarse adjustment, patent double speed fine adjustment (see page 4), spiral rack and pinion focussing and screw centring substage, large square stage with removable mechanical stage, double mirror, pillar and tripod stand.

No. 17.	**STAND ONLY**, with Mechanical Stage, in Mahogany case, no Object Glasses, Eyepieces, Condenser or Nosepiece				£12 5 0
No. 17K.	**Stand as above**		£12 5 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 823.	$\frac{2}{3}$ inch (16 mm.) Object Glass	1 5 0		
	,, 826.	$\frac{1}{6}$ inch (4 mm.) do. with Collar Adjustment	2 15 0		
	,, 911A.	Abbé Condenser, with Iris Diaphragm ..	1 15 0		
		Magnifying power from 54 *to* 400.			18 10 0
No. 17M.	**Stand as above**		£12 5 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 822.	1 inch (22 mm.) Object Glass	1 5 0		
	,, 825.	$\frac{1}{4}$ inch (6 mm.) do., with Collar Adjustment	2 0 0		
	,, 830.	$\frac{1}{12}$ inch (2 mm.) Oil Immersion .. .. or No. 830A. $\frac{1}{24}$ (1·8 mm.) Oil Immersion ..	5 0 0		
	,, 902A.	Beck's Achromatic Condenser, with Iris Diaphragm..	3 12 0		
	,, 192A.	Triple Nosepiece	0 17 6		
		Magnifying power from 38·5 *to* 880.			25 9 6
No. 17P.	**Stand as above**		£12 5 0		
	No. 364A.	2 Eyepieces, Nos. I. and II.	0 10 0		
	,, 822.	1 inch (22 mm.) Object Glass	1 5 0		
	,, 824.	$\frac{1}{2}$ inch (12 mm.) do.	1 10 0		
	,, 826.	$\frac{1}{6}$ inch (4 mm.) do., with Collar Adjustment	2 15 0		
	,, 830.	$\frac{1}{12}$ inch (2 mm.) Oil Immersion Object Glass or No. 830A. $\frac{1}{24}$ (1·8 mm.) Oil Immersion	5 0 0		
	,, 192A.	Triple Nosepiece	0 17 6		
	,, 902A.	Beck's Achromatic Condenser	3 0 0		
	,, 905C.	Patch Stops	0 12 0		
		Magnifying power from 38·5 *to* 880.			27 14 6
No. 17Q.	**Stand as above**		£12 5 0		
	No. 364A.	5 Eyepieces, Nos. I., IA., II., IIA. and III.	1 5 0		
	,, 820.	2 inch (40 mm.) Object Glass	1 0 0		
	,, 822.	1 inch (22 mm.) do.	1 5 0		
	,, 824.	$\frac{1}{2}$ inch (12 mm.) do.	1 10 0		
	,, 825.	$\frac{1}{4}$ inch (6 mm.) do., with Collar Adjustment	2 0 0		
	,, 827.	$\frac{1}{8}$ inch (3 mm.) do., do.	3 10 0		
	,, 830.	$\frac{1}{12}$ inch (2 mm.) Oil Immersion .. .. or No. 830A. $\frac{1}{24}$ (1·8 mm.) Oil Immersion	5 0 0		
	,, 902A.	Beck's Achromatic Condenser	3 0 0		
	,, 905C.	Patch Stops	0 12 0		
	,, 192A.	Triple Nosepiece	0 17 6		
	,, 384.	Polarizing Apparatus	1 15 0		
	Nos. 346 & 349B.	Eyepiece and Stage Micrometers ..	1 10 0		
	No. 340.	Vertical Camera Lucida	0 18 0		
		Magnifying power from 16 *to* 1650.			38 7 6

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 1105. Imperial Microscope. Continental Base.

Stand No. 1105.

(*For description see pp. 4, 5 and 6*).

This stand has small body with sliding draw-tube graduated in mm., taking eyepiece ·917 in. diameter. Continental Model Base and Pillar. Plain square stage with graduated mechanical removable top-stage and the following adjustments :—

Coarse focussing adjustment, double speed fine adjustment, coarse focussing adjustment and centring adjustments to substage, swinging mirror and clamp to joint.

With the two additional adjustments supplied in No. 1105A the stand is suited for the most critical Visual or Microphotographic work.

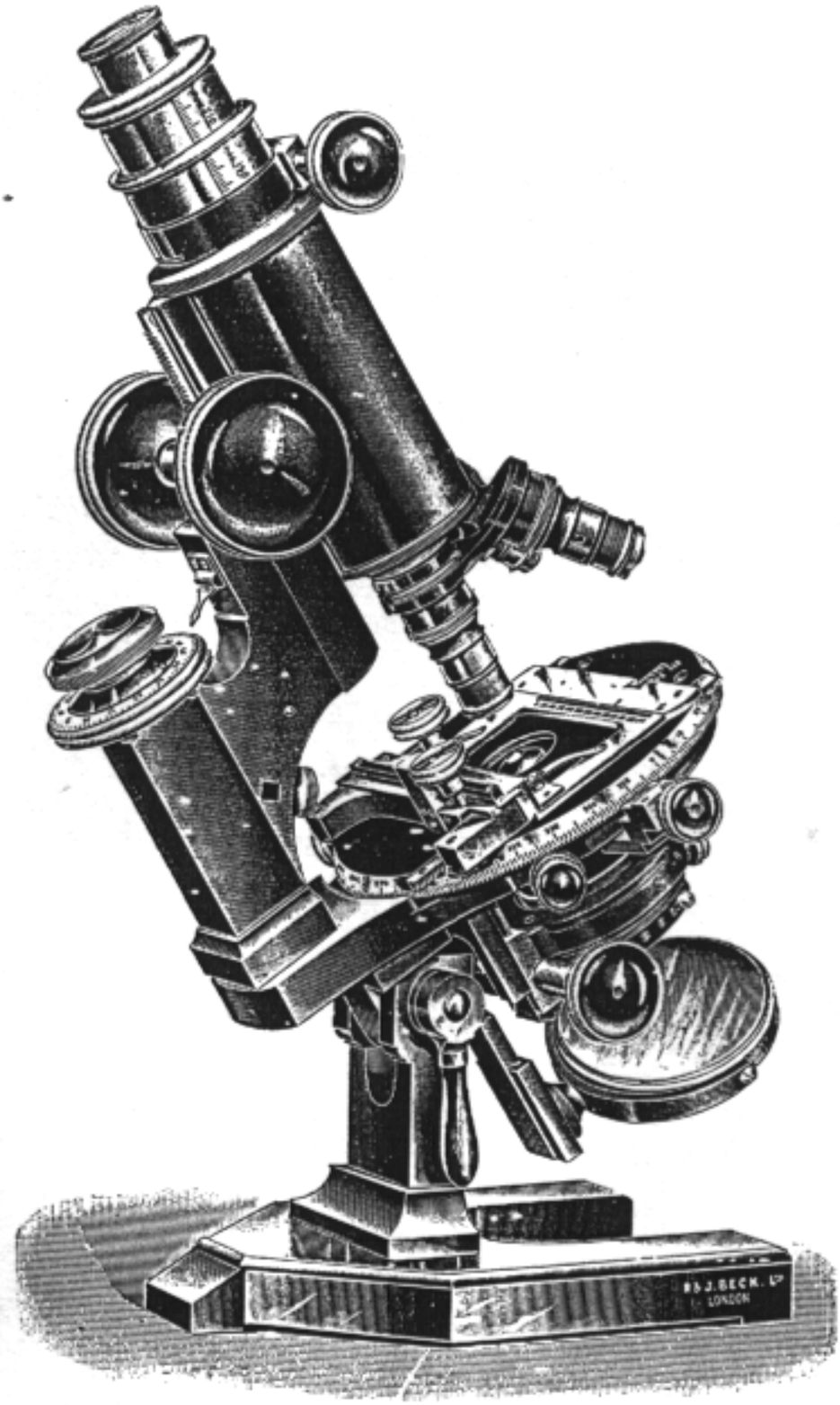
No. 1105.	**Stand only, in case**			**£16 10 0**
No. 1105A.	**Stand, in case**	**£16 10 0**		
	(β). Large body with rack and pinion draw-tube and additional sliding draw-tube in place of small body (see page 38)	3 0 0		
	(θ). Fine adjustments to substage	2 5 0		
				21 15 0
No. 1105B.	**Stand No. 1105, in case**	**£16 10 0**		
	No. 364A. 3 Eyepieces, Nos. I., II., IIA	0 15 0		
	„ 802. $\frac{2}{3}$ inch (16 mm.) Object Glass	0 12 0		
	„ 804. $\frac{1}{6}$ inch (4 mm.) do.	1 10 0		
	„ 810A. $\frac{1}{14}$ inch (1·8 mm.) 1·N.A. Oil Immersion do.	4 0 0		
	„ 902A. Beck's Achromatic Condenser with Iris diaphragm	3 0 0		
	„ 192A. Dust-tight Triple Nosepiece..	0 17 6		
				27 4 6
No. 1105C.	**Stand No. 1105A, in case**	**£21 15 0**		
	No. 1 Eyepiece, large size, 1·41 inch No. I. ..	0 15 0		
	„ 364A. 2 Eyepieces, small size, ·917 inch, Nos. II., IIA.	0 10 0		
	„ 823. $\frac{2}{3}$ inch (16 mm.) Object Glass	1 5 0		
	„ 826. $\frac{1}{6}$ inch (4 mm.) do.	2 15 0		
	„ 830. $\frac{1}{14}$ inch (1·8 mm.) 1·25 N.A. Oil Immersion do.	5 0 0		
	„ 902A. Beck's Achromatic Condenser	3 0 0		
	„ 905C. Patch Stops	0 12 0		
	„ 192A. Dust-tight Triple Nosepiece	0 17 6		
				36 9 6

Stand No. 1102.

This Stand is the same as No. 1105, but has the English Model Tripod foot as figured on page 40. With the two additional adjustments supplied in No. 1102A the Stand is fitted for the most critical Visual or Microphotographic work.

No. 1102.	**Stand only, in case**			**£20 0 0**
No. 1102A.	**Stand, in case**	**£20 0 0**		
	(β). Large body with rack and pinion draw-tube and additional sliding draw-tube in place of small body (see page 38)	3 0 0		
	(θ). Fine adjustment to substage	2 5 0		
				25 5 0
No. 1102B.	**Stand No. 1102.** Appliances as No. 1105B			30 14 6
No. 1102C.	**Stand No. 1102.** Appliances us No. 1105C			39 19 6
Binocular Body planed to be interchangeable with ordinary body, extra				5 0 0
No. 917. Additional Swing-out Adjustment to Condenser (see page 12)				2 0 0

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.



No. 1104. Imperial Microscope.

Complete Model. Continental Base.

Stand No. 1104.

(*For description see pages 4, 5, 6.*)

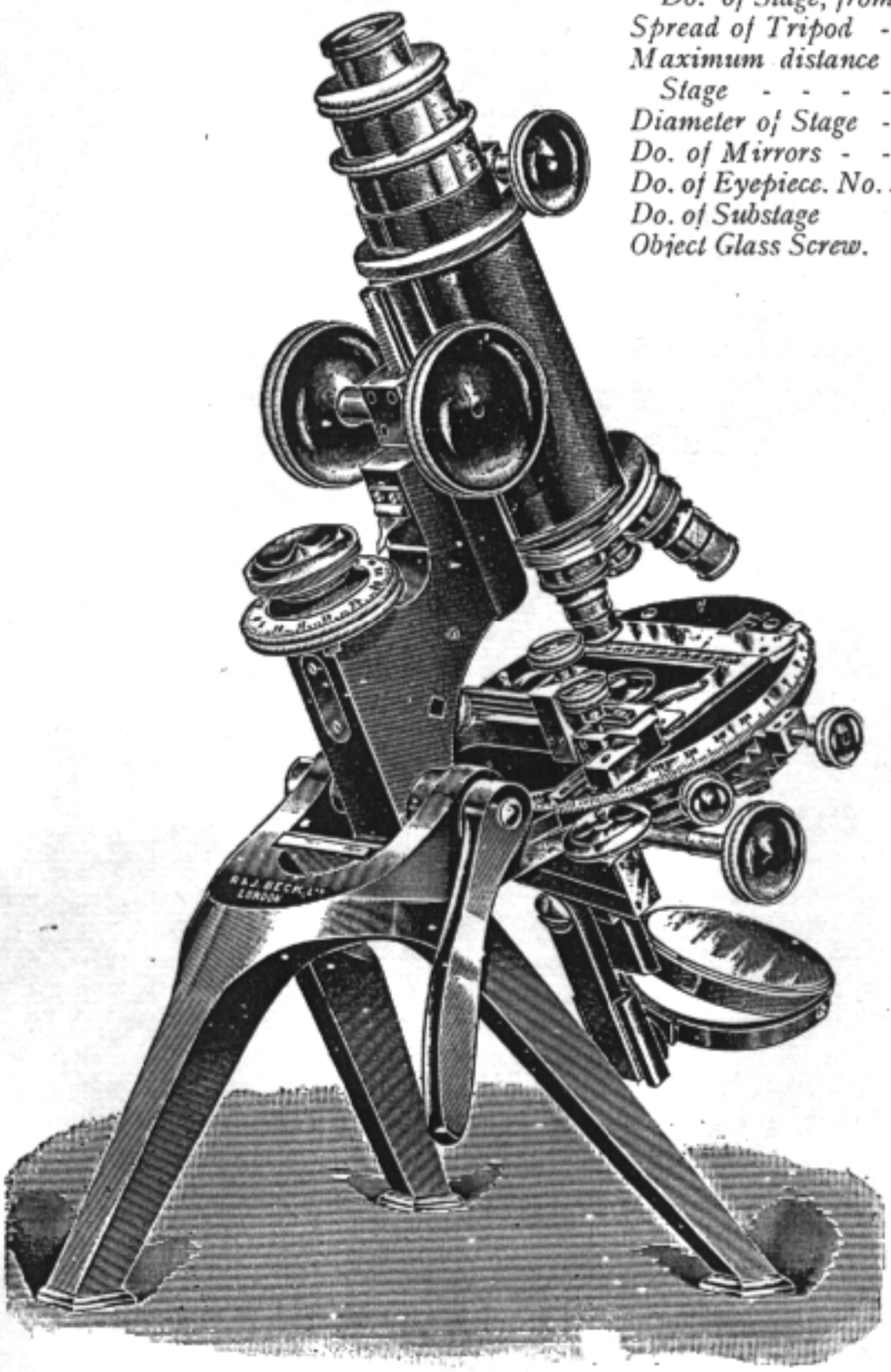
This Stand is the same as Stand 1104, but complete on the Continental base and pillar, with all adjustments (β) (γ) (σ) (ϵ) (λ) (θ). It can be supplied without any one or other of these at a reduction in price as specified below.

No. 1104.	Stand in case. No. 1105	£16 10 0		
(β).	Large body with rack and pinion draw-tube and additional draw-tube in place of small body	3 0 0		
(γ).	Large concentric rotating stage with mechanical movements in place of ordinary mechanical stage	8 7 6		
(σ).	Graduated circle to rotation of stage	0 10 0		
(ϵ).	Rack and pinion motion to rotation of stage	2 7 6		
(λ).	Centring screws to stage	1 10 0		
(θ).	Fine focussing adjustment to substage	2 5 0		
			34 10	0
No. 1104A.	**Stand complete,** No. 1104 as above, in case	£34 10 0		
No. 171.	2 Eyepieces, largest size, 1·41 in. Nos. I., IA.	1 10 0		
,, 364A.	2 Eyepieces, small size, Nos. II., IIA. ..	0 10 0		
,, 802.	$\frac{2}{3}$ inch (14 mm.) Object Glass	0 12 0		
,, 804.	$\frac{1}{6}$ inch (4 mm.) do.	1 10 0		
,, 810A.	$\frac{1}{14}$ inch (1·8 mm.) 1·N.A. Oil Immersion do.	4 0 0		
,, 902A.	Beck's Achromatic Condenser with Iris Diaphragm	3 0 0		
,, 917.	Swing-out Mount for Condenser in place of Ordinary Mount	2 0 0		
,, 192A.	Triple Nosepiece	0 17 6		
			48 9	6
No. 1104C.	**Stand complete,** No. 1104 as above, in case	£34 10 0		
No. 171.	2 Eyepieces, largest size, 1·41 in., Nos. I., IA.	1 10 0		
,, 170.	1 Orthoscopic Eyepiece, No. II.	0 18 0		
,, 364A.	3 Eyepieces, small size, Nos. II., IIA., III.	0 15 0		
,, 841.	3 inch (59 mm.) Object Glass, wide angle, N.A.	1 10 0		
,, 843.	1½ inch (28 mm.) do. do. N.A.	1 15 0		
,, 844.	$\frac{2}{3}$ inch (16 mm.) do. do. N.A.	1 15 0		
,, 845.	$\frac{4}{10}$ inch (8 mm.) do. do. N.A.	3 10 0		
,, 825.	$\frac{1}{4}$ inch (6 mm.) do. Series B ..	2 0 0		
,, 827.	$\frac{1}{8}$ inch (3 mm.) do. do. ..	3 10 0		
,, 829.	$\frac{1}{12}$ inch (2 mm.) do. 1·4 N.A. Oil Immersion	8 0 0		
,, 902A.	Beck Achromatic Condenser, 1 N.A. ..	3 0 0		
,, 901A.	Patch Stops	0 12 0		
,, 905B.	Additional Condenser, 1·4 N.A. to fit same mount	2 15 0		
,, 917.	Swing-out Mount for Condenser, in place of Ordinary Mount	2 0 0		
,, 192A.	Dust-tight Triple Nosepiece	0 17 6		
,, 347A.	Eyepiece Micrometer	0 5 6		
,, 350.	Stage Micrometer inch and mm. (Grayson's)	0 10 0		
,, 340A.	Beck's Vertical Camera Lucida	0 18 0		
	Mahogany Case to contain apparatus ..	2 0 0		
			72 11	0
Binocular Body planed to be interchangeable with ordinary body, extra			5 0	0

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.

Dimensions.

Height when vertical, racked down	$10\frac{7}{8}$″
Do. do. with nosepiece and object glass in use	$12\frac{1}{2}$″
Do. of Optic Axis Tube, horizontal	$9\frac{1}{2}$″
Do. of Stage, from table	5″
Spread of Tripod	$8\frac{1}{2} \times 9$″
Maximum distance of Nosepiece from Stage	4″
Diameter of Stage	5″
Do. of Mirrors	$2\frac{1}{2}$″
Do. of Eyepiece. No. 4 R.M.S. Standard	1·41″
Do. of Substage R.M.S. Standard	1·527″
Object Glass Screw. R.M.S. Standard	



No. 1101. Imperial Microscope.

Complete Model. English Base.

Stand No. 1101. *For description, see pages 4, 5, 6.*

This Stand is the same as Stand No. 1104, on English tripod foot, but complete with all adjustments (β) (γ) (δ) (ϵ) (λ) (θ). It can be supplied without any one or other of these at a reduction in price as specified below :—

No. 1101.	**Stand, in case,** No. 1102			£20	0 0
	(β). Large body with rack and pinion draw-tube and additional sliding draw-tube			3	0 0
	(γ). Large concentric rotating stage with mechanical movements in place of ordinary mechanical stage			8	7 6
	(δ). Graduated circle to rotation of stage			0	10 0
	(ϵ). Rack and pinion to rotation of stage			2	7 6
	(λ). Centring screws to stage			1	10 0
	(θ). Fine focussing adjustment to substage			2	5 0
					£38 0 0

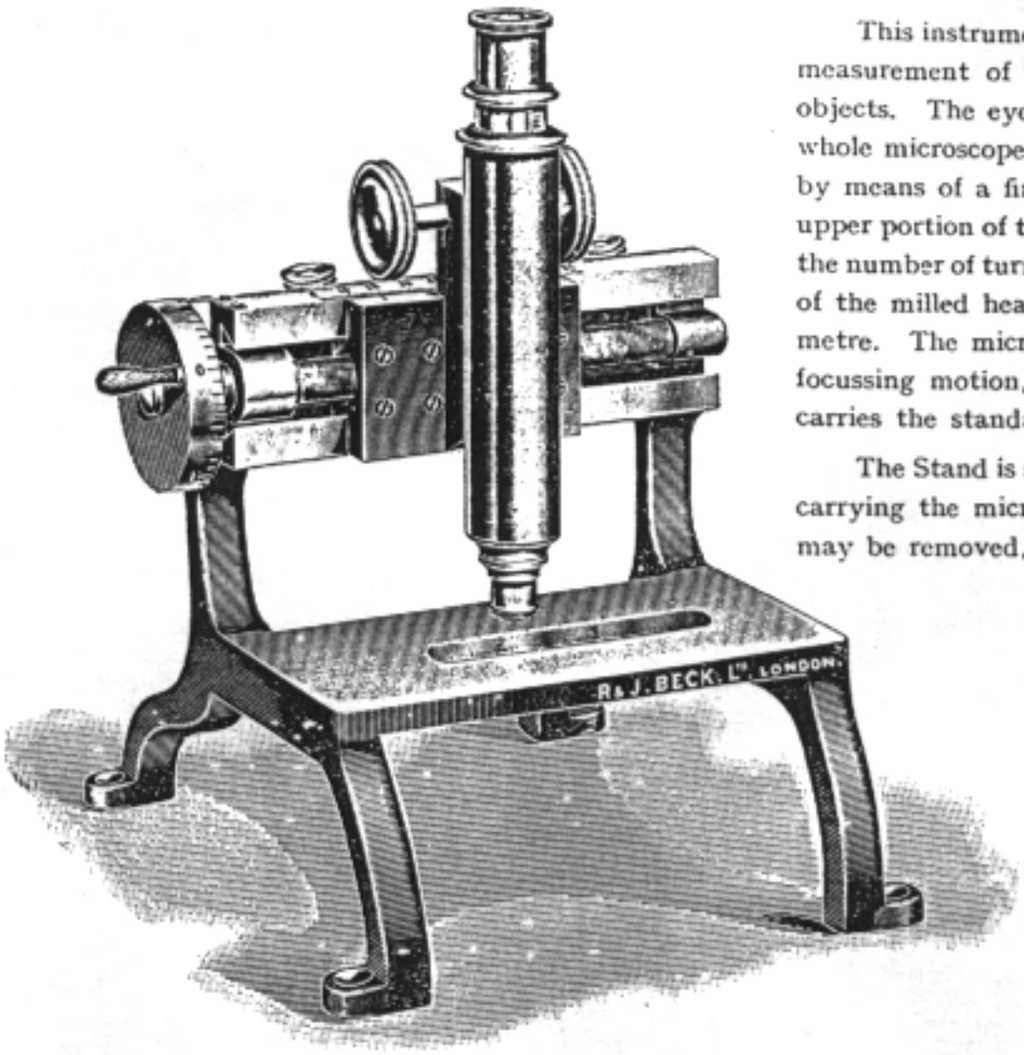
A further adjustment (γ) may be added to this instrument for Metallurgical work (see page 4), whereby the entire stage and substage may be moved away from the body to a further distance of two inches, by means of a rack and pinion, to allow of the examination of very thick specimens with low powers, etc. For this purpose the limb of the instrument is prolonged downwards in the form of a massive bar, upon which the whole stage, substage and mirror slide. This adjustment cannot be made use of when the microscope is in a strictly vertical position, unless the adjustment (θ), fine adjustment to substage, is dispensed with. The adjustment is, however, specially intended for use with the microscope in a horizontal position in connection with the observing prism (see apparatus catalogue).

No. 1101*.	**Stand No. 1101.** No. 1101 complete			£38	0 0
	(γ) Adjustment to stage to increase focussing distance			6	0 0
					£44 0 0

No. 1101M.	**Stand No. 1101,** complete			32	12 6
.. 171.	3 Eyepieces, largest size 1·41 in., Nos. 1, 1A, 2	£2	5 0		
.. 364A.	4 Eyepieces, small size, Nos. 2A, 3, 4, 5	1	0 0		
.. 170A.	1 Projection Eyepiece	2	0 0		
.. 170.	1 Orthoscopic Eyepiece, No. 2	0	18 0		
.. 840.	4 inch (65·5 mm.) Object Glass, wide angle, ·08 N.A.	1	10 0		
.. 841.	3 inch (59 mm.) do. ·11 N.A.	1	10 0		
.. 843.	1½ inch (28 mm.) do. ·2 N.A.	1	15 0		
.. 844.	⅔ inch (16 mm.) do. ·28 N.A.	1	15 0		
.. 845.	⅛ inch (8 mm.) do. ·75 N.A.	3	10 0		
.. 825.	¼ inch (6 mm.) do. Series B	2	0 0		
.. 827.	⅛ inch (3 mm.) do. Series B	3	10 0		
.. 829.	1/12 inch (2 mm.) 1·4 N.A., Oil Immersion do.	8	0 0		
	1 inch Beck-Steinheil Orthostigmat Lens	4	7 6		
	2 inch do. do. ..	4	7 6		
	Adapter to carry Orthostigmat lenses inside body of microscope	0	5 0		
.. 902A.	Beck's Achromatic Condenser, 1· N.A., with Iris diaphragm ..	3	0 0		
.. 905E.	Set of 3 patch stops, in brass box	0	12 0		
.. 904.	1·4 N.A. Achromatic Condenser Lenses only, to fit mount of 902A	2	15 0		
.. 917.	Swing-out mount to condenser in place of usual one	2	0 0		
.. 192A.	Dust-tight Triple Nosepiece ..	0	17 6		
.. 312A.	Polarizing Apparatus, with large size Ahren's prism polarizer and analyzer to fit over eyepiece or object glass	4	8 0		
No. 316.	Selenite Stage			2	2 0
.. 345.	Cobweb Eyepiece Micrometer			4	10 0
.. 350A.	Stage Micrometer, inch and metre, Grayson			0	10 0
.. 340A.	Vertical Camera Lucida ..			0	18 0
	Erecting Prism Eyepiece ..			0	15 0
.. 344.	Goniometer			2	10 0
.. 330.	Sorby's Microspectroscope ..			6	6 0
.. 333.	Sorby's Standard Scale ..			1	10 0
.. 334.	1 doz. cells for spectroscope ..			0	8 6
	Eyeshade with obscuring disc for unemployed eye			0	5 0
	Trough for monochromatic light solutions			0	7 6
.. 202.	Maltwood's Finder			0	8 0
.. 223.	Parabolic Lieberkuhn fitted to 1½ inch and ⅔ inch object glasses			1	0 0
.. 242.	Large Bull's-Eye Condensing Lens on stand			1	1 0
.. 210.	Amici Prism on stand			1	15 0
.. 243.	Side Condensing Lens, to fit limb of microscope			0	15 0
.. 263.	Stage Forceps			0	6 0
.. 251.	Parallel Plate Compressor ..			1	3 0
.. 362.	Live Box			0	4 6
.. 280.	Zoophyte Trough			0	5 6
.. 284.	Set of Live Traps			1	13 0
.. 257.	Opaque Disc Revolver ..			1	18 0
.. 227.	Wenham Parabolic Reflector ..			1	7 6
.. 222	Beck's Vertical Illuminator ..			0	13 0
	Observing Prism and Body ..			3	3 0
	Cases to hold all apparatus ..			3	10 0
					£136 10 0
Binocular Body, planed to be interchangeable with ordinary body, extra				5	0 0
					£141 10 0

Any Object Glasses or Apparatus may be included or omitted at a corresponding increase or reduction in price.

Beck's Micrometer Microscope.



This instrument is intended for the accurate measurement of either opaque or transparent objects. The eyepiece has cross lines, and the whole microscope is traversed across the object by means of a fine micrometer screw. On the upper portion of the stand is a scale representing the number of turns of the screw, whilst the drum of the milled head records to $\frac{1}{100}$th of a millimetre. The microscope has a rack and pinion focussing motion, a graduated draw-tube, and carries the standard R. M. Society screw.

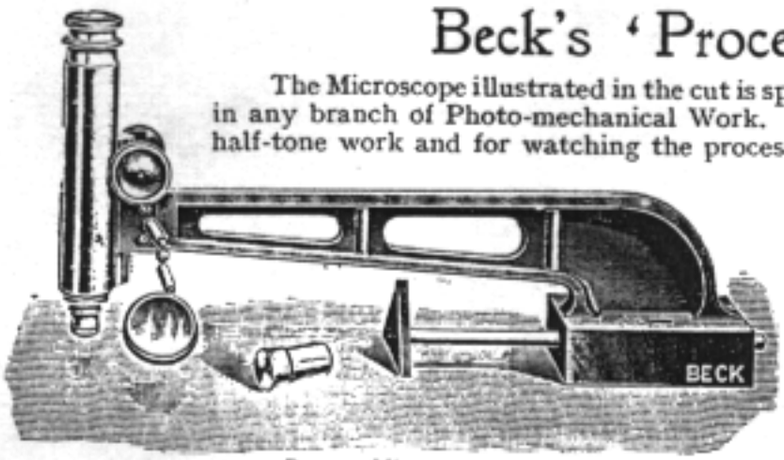
The Stand is so made that the entire portion carrying the microscope and micrometer screw may be removed, and attached in a horizontal position. A telescope object glass may now be used in place of the microscope object glass, and may be focussed by means of the draw-tube. In this way the instrument may be used for readings at a distance.

Price, with one eyepiece, one microscope object glass (1 in. focus), No. 801 **£8 7 6**

Telescope object glass **£0 7 6**

Beck's 'Process' Microscope.

The Microscope illustrated in the cut is specially designed for the examination of "surface" in any branch of Photo-mechanical Work. For the examination of the form of the dots in half-tone work and for watching the process of etching they are invaluable. They may be used with success for ascertaining the grain of a collotype or examining the three-colour work as it comes off the machine.



Process Microscope.

The Microscope is supplied with a rack and pinion motion for focussing, and has draw-tube. The object-glass we recommend is our 1 in., and this, combined with the No. 2 eyepiece, will give all the magnification that is required; by simply pulling out the draw-tube, however, increased magnification is attainable. The illumination is given by a jointed condenser, which can be made to move in any direction.

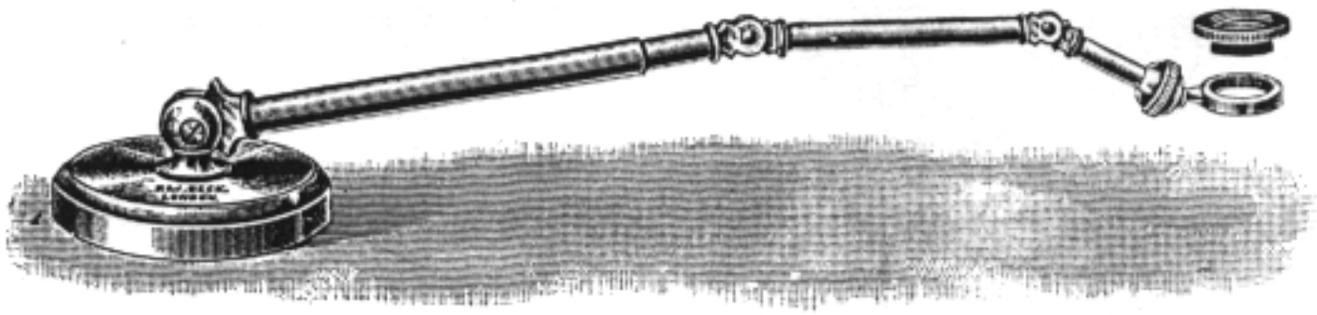
The Microscope on its long arm and heavy base can be screwed down to the bench and the plates simply passed under it, or it can be placed where required, and the steadiness ensured by the sliding foot supplied with it

PROCESS MICROSCOPE.			
No. 1.	Rack and Pinion Motion. Draw-tube, Long-arm Condenser, 1 in. Object-glass and Eyepiece.	Magnifying power from 59 to 74.	£2 13 6
No. 2.	Sliding Adjustment. Draw-tube, 1 in. Object-glass and Eyepiece.	Magnifying power from 59 to 74.	£2 2 0

N.B.—Prices of higher or low-power object glasses on application.

Special Eyepiece, fitted to Process Microscope, one of which rotates and measures, by means of a scale, angular inclination of lines of dots in process blocks or prints..... £0 15 0

No. 33. Lankester's Dissecting Stand.



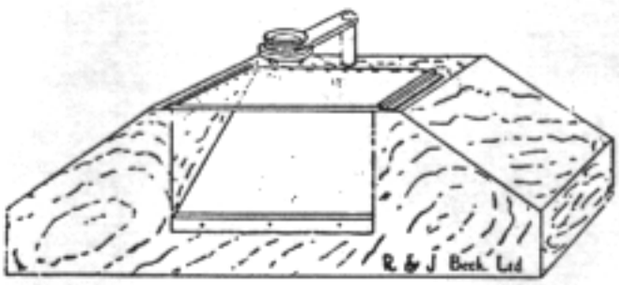
The Lankester Dissecting Stand consists of a heavy brass base measuring 4 inches across. It has 3 knuckle joints, so that it can be used in almost any position. It carries the ordinary single lenses, Achromatic Triplets, Erect Image Microscope, or small Compound Microscope.

No. 33.	Lankester Dissecting Stand		£1	15	0
No. 961.	Single Lenses	each	0	3	0
	Achromatic Triplets	„	0	10	0
No. 950A.	Erect Image Microscope		1	1	0
	Compound Microscope		0	18	6

The Lankester Dissecting Stand is also made with a fixed upright, which has a rack and pinion motion, the arm with the three knuckle joints being fixed on the top of this upright.

Lankester Dissecting Stand, with rack and pinion adjustment £2 5 0

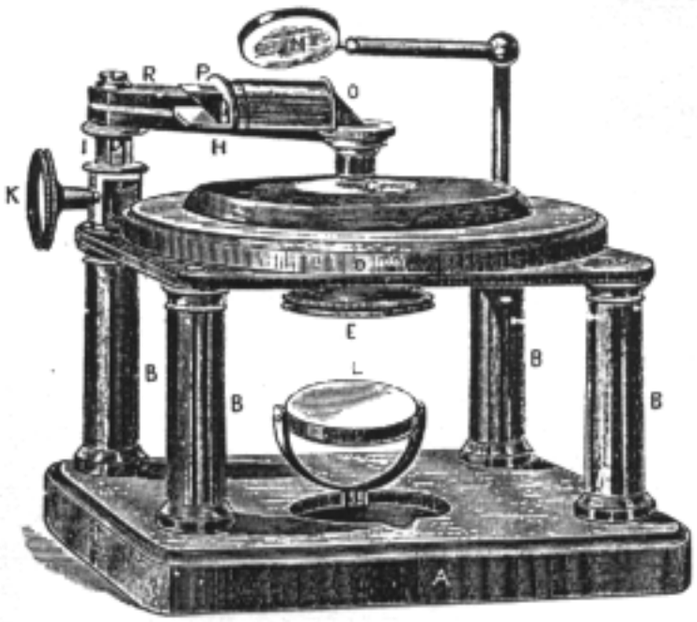
The Cornex Dissecting Microscope.



This is made of a solid block of wood, made to form rests for the hands on each side. It is provided with a glass plate and has a mirror at 45° for illuminating the object which is being dissected. The lens is held in a fitting which swings over the glass plate and can be used in any position. This fitting slides up and down for focussing. Two lenses of excellent quality are supplied. One is used by itself, giving a magnification of 7. The other lens fits into the first one, and the lenses thus combined give a power of 14.

Price, with Two Lenses .. .. **10s. 6d.**

Large Dissecting Microscope.



This instrument is a very rigid stand. It has complete sliding and revolving stage plates The arm will carry either single or triple lens, an erect Image Microscope or a Compound Microscope. The arm can be moved up and down by rack and pinion for focussing. It has a mirror with all movements.

No. 38A. Stand with Side Condenser, Mirror, 2 Single Lenses, 2 Achromatic Triplets, in case £5 10 0

Small Dissecting Microscope.

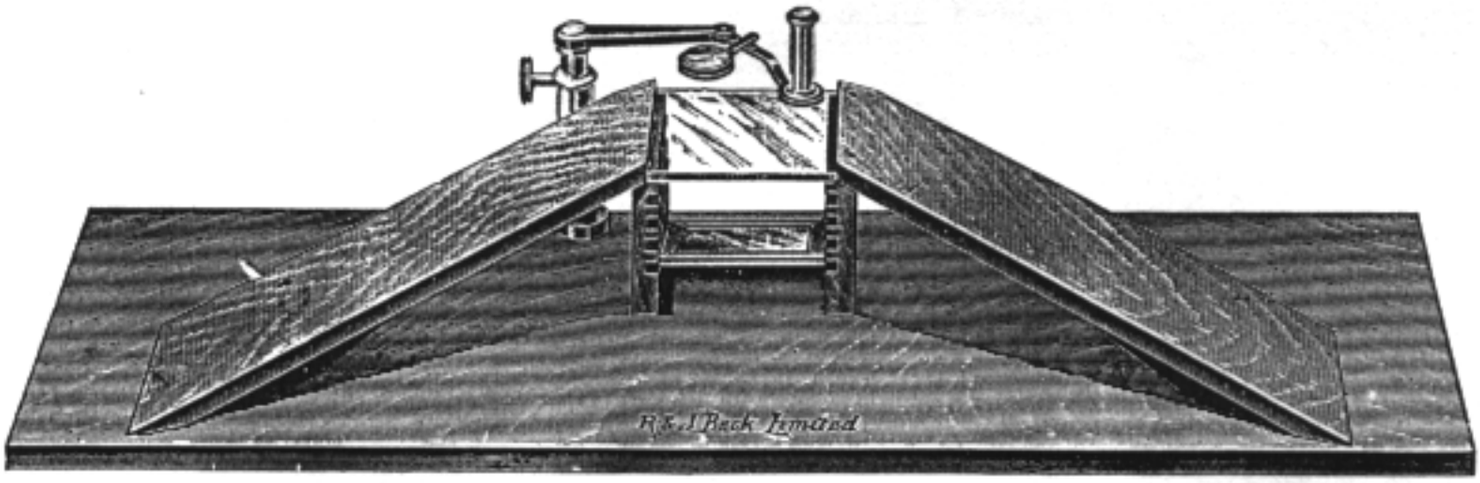


A small Brass Dissecting Stand, with rack and pinion focussing, and mirror, with all adjustments. The arm is jointed and swings over the stage.

No. 32.	Small Dissecting Microscope, Stand only	£1	11	0
No. 962.	2 Single Lenses	0	6	0
No. 402.	Side Condenser	0	5	0
	Mahogany Case with lock and Ley	0	10	0
		£2	12	0

Dissecting Microscopes.

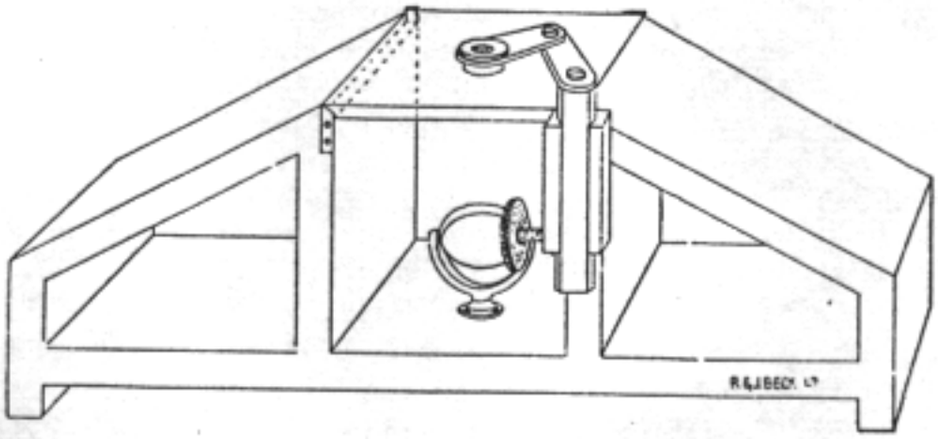
No. 37. The Zoologist Dissecting Microscope.



This Instrument has been designed for dissecting for long periods at a time. The stand is 2 feet 8 inches in length, and the rests are arranged so as to support the entire arms to the elbows in the position most convenient for dissecting. The glass Stage Plate, which carries the object, may be used in any of the grooves provided for it. Below the Stage Plate is a mirror, which is arranged so that it may be used at any angle. The Lenses are carried on a swinging jointed arm, raised and lowered by rack and pinion. This fitting carries the ordinary lenses and also will fit the Erect Image Microscope (No. 950A) and a small Compound Microscope. A special arm is provided for large field, low-power lenses.

No. 37.	Zoologist Dissecting Microscope, Stand only with Stage Plate, Mirror		£2 10 0
No. 37B.	Stand, with Stage Plate, Mirror	£2 10 0	
	No. 961. Single Lens, 2-in. focus	0 3 0	
	,, 961. ,, ,, 3-in. ,, ...	0 3 0	
	,, 955. Achromatic Triplet	0 10 0	
	,, 956. ,, ,, ...	0 10 0	
	,, 950A. Erect Image Microscope	1 1 0	
	,, 401. Side Condensing Lens on Stand	0 8 0	
			£5 5 0

The Class Dissecting Microscope.

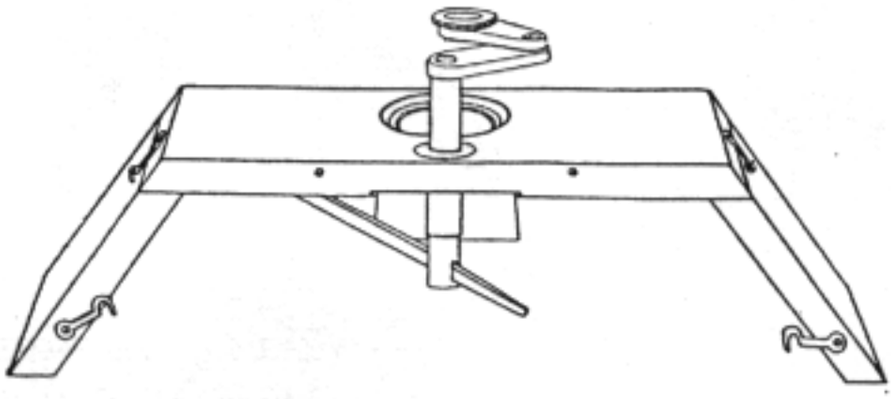


A strong and convenient instrument of great rigidity for the laboratory. It is made in mahogany, with rack and pinion focussing motion and double mirror. The lenses fit in a jointed arm, so that a large area of surface can be examined. The Stage is of glass and measures 4½ in. × 4½ in. It is removable, and an opal glass or vulcanite plate can be used if desired. The length of the instrument is 15 inches, breadth 5 inches, and height to stage 5½ inches.

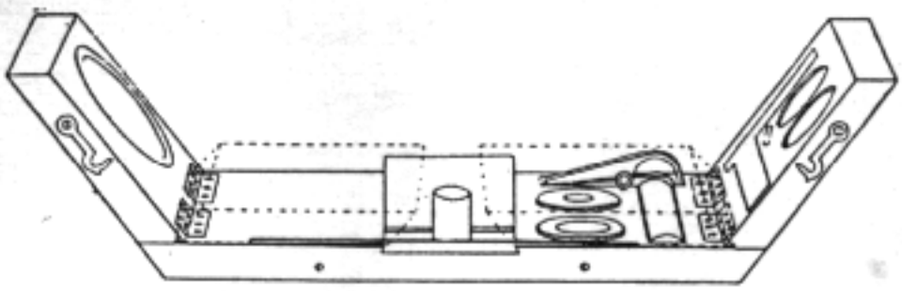
No. 37A.	Stand, with Glass Stage and Mirror		£2 0 0
	Single Lenses	each	0 3 0
	Achromatic Triplets, ×8, ×9, ×10, ×16, ×20, ×25, or ×35	,,	0 10 0
No. 967.	Small Compound Microscope, ×30	..	0 18 6
No. 950A.	Erect Image Microscope	..	1 1 0
	Vulcanite Plate, to fit Microscope	..	0 5 0
	Opal Stage Plate	..	0 1 6

Longstaff's Portable Dissecting Microscope.

This Dissecting Microscope is made in a portable form with all the necessary apparatus packed into the thickness of the wood, so that when folded there are no projections or loose pieces.



The size when folded is 9 inches by $3\frac{3}{4}$ inches by $1\frac{1}{8}$ inches. Fig. 1 shows the instrument ready for use. It is strongly made and consists of a wooden table with two side flaps, which spread out as rests for the hands; these are hinged and fold back as shown by the dotted lines in Fig. 2, when not in use.



The wooden table has a circular aperture into which drops a white porcelain saucer, which is concave on one side and flat on the other, and can be used either way up, or a piece of transparent glass may be used in place of the saucer, in which case light may be thrown from below by means of a folding flap which carries a white reflector.

The lens carrier consists of a tube which fits into a socket in the table, upon the upper end of which is hinged a double, into the end of which the lens to be used is dropped. The lens can be given motion by means of this jointed arm to examine the whole surface of the aperture, which is about $2\frac{1}{2}$ inches. At the lower end of the tube that carries the lens arm are two slots through which a lever which clips on to a stud on the under surface of the wooden table passes. By removing this lever up and down a delicate focussing adjustment is obtained.

We recommend that the lever be held between the first and second finger and that the thumb be placed on the upper surface of the table.

For packing purposes the entire apparatus, including two lenses, with focussing apparatus and lens holder, a porcelain saucer and glass plate, pack away into the under surface of the table, and, when the flaps are closed, are firmly held in position.

PRICES.

Portable Dissecting Microscope, with two Single Lenses, Saucer, Glass Plate, Focussing Adjustment and two Needles..	£1 15 0
Beck Aplanat Triplet to Magnify 12	0 10 0
" " " " 7	0 10 0
" " " " 9	0 10 0
Erect Image Microscope .. 30	1 1 0

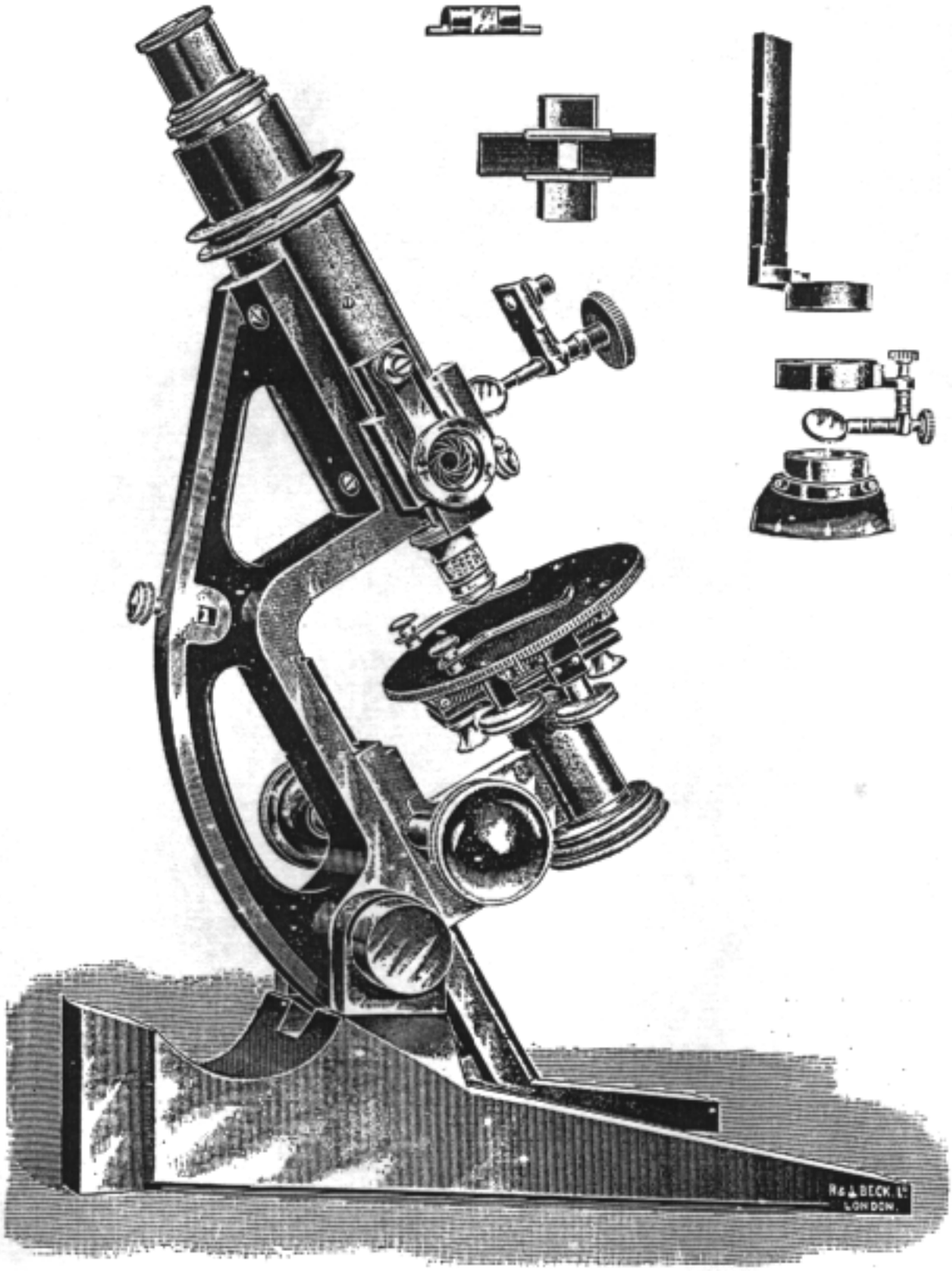
Microscope Apparatus.

	£	s.	d.
No. 1191. Stage, with mechanical motions in both directions, applicable to all instruments..	3	10	0
No. 395. Sliding Ledge Top Stage for "Star" Microscope.. ..	0	3	6
No. 395a. Sliding Ledge Top Stage for "London" Microscope	0	7	6
No. 175a. Pointer fitted to "London" Eyepiece	0	2	6
No. 172a. Eyeshade for "London" Microscope	0	1	0
No. 202. Maltwood's Finder ..	0	8	0
No. 865. Nosepiece with shutter for Micro-photography.. ..	0	7	6
No. 865a. Nosepiece with Iris diaphragm	0	12	6
No. 865e. Cheshire's Apertometer	0	15	0
No. 865f. Apertometer Eyepiece for No. 865a	0	12	6
No. 392a. Double Nosepiece ..	0	9	0
No. 392b. Double Nosepiece, Dust-tight	0	15	0
No. 392*. Double Nosepiece, with adapter	0	12	6
No. 192a. Triple Nosepiece, Dust-tight	0	17	6
No. 192*. Triple Nosepiece, Trefoil pattern	1	4	0
No. 397. False Milled Heads ..	0	5	6
No. 1243. Optical Bench with Nernst Lamp, and complete apparatus, and Diffraction Prism for giving Monochromatic Light	14	12	6
No. 757. Monochromatic Light Trough on adjustable stand ..	1	1	0
Simple Trough for Lighter Filter 3 × 1 in. Coloured Slips of Glass.	0	3	0
No. 292. Blue, in 3 shades each	0	0	3
No. 291. Opal .. .. each	0	0	3
No. 291a. Ground Glass .. each	0	0	3
No. 291b. Spectrum Green, 3 × 1 Slip	0	1	6
No. 382. Wenham's Parabolic Reflector	1	2	0
No. 228. Spot Lens	0	11	6
No. 228a. Spot Lens, smaller ..	0	7	6
No. 228b. Expanding Iris Diaphragm, Patch Stop	0	7	6
No. 228c. Do. do. to give larger patch	0	10	6
No. 228b. Rheinberg's Colour Disc and Spot Lens	0	10	6
No. 242. Large Bull's-Eye Condenser on Stand..	1	1	0
No. 242a. Do. do. raising motion only	0	18	0
No. 242b. Iris Diaphragm, attachable to No. 242 or 242a ..	0	10	6
No. 214. Smaller Condensing Lens on Stand	0	12	0
No. 401. Do. do.	0	8	0
No. 305. Do. do. to fit Stage	0	5	0
No. 241. Side Silver Reflector on Stand..	1	3	0
No. 132. Lieberkuhns to fit Low Powers .. .. .. 8/0 to	0	12	6
No. 223. Parabolic Lieberkuhn..	1	0	0
No. 224. Do. do. with Sorby Reflector	1	15	0
No. 867. Thin Glass Transparent Vertical Illuminator	0	10	6
No. 221. Beck's Vertical Illuminator	0	10	6
No. 222. Do. do. with diaphragm	0	13	0
No. 866. Prism Vertical Illuminator	1	1	0

	£	s.	d.
No. 259. Opaque Disc Revolver and Forceps	1	1	0
No. 257. Do. do. and tray of Discs	1	18	0
No. 258. Opaque Disc Revolver and Forceps	3	3	0
No. 265. Stage Mineral Holder	1	3	0
No. 263. Stage Forceps ..	0	6	6
No. 366. *Do. do. smaller size	0	4	6
No. 252a. Davis Ebonite Reversible Compressor	0	10	6
No. 253. Wenham's Compressor	0	5	0
No. 251. Beck's Parallel Plate Compressor	1	3	0
No. 268. Rousselet's Compressor	0	15	0
No. 255. Large Live Box ..	0	6	6
No. 256. Smaller Live Box ..	0	5	0
No. 362. Small Live Box ..	0	4	6
No. 254a. Rousselet's Live Box..	0	10	0
No. 267. Beck's Growing Cell ..	0	10	0
No. 270. Dunning's Live Cell ..	0	5	6
No. 270. Dunning's Live Cell, without Ebonite Plate.. ..	0	4	6
No. 282*. Botterell's Life Slide..	0	3	0
No. 282. Botterell's Trough ..	0	3	6
No. 280a. Slip with Trough, 3-in. × 1½-in.	0	1	6
No. 280c. Do. do. 3-in. × 1-in.	0	1	0
No. 280. Glass Trough with spring wedge	0	7	6
No. 281. Do. do. smaller size	0	6	0
No. 363. Do. do. small size ..	0	5	6
No. 284. Set of 6 Beck's Live Traps and Trough in Case ..	1	13	
No. 283. Single Live Trap ..	0	8	0
No. 253. Glass Slip with Ledge	0	1	0
No. 257. Glass Slip with Ledge and Hollow	0	1	6
No. 288. Do. do. and Lip	0	4	6
No. 289. Glass Slips with hollow each	0	0	2
No. 289a. Opal Glass Slips with Transparent Hollow .. each	0	0	3
No. 295. Weber's Slip with Convex Cell	0	3	6
No. 296 & 297. Holman's Life Slide	0	3	6
No. 294. Current Slide	0	5	6
No. 294a. Current Slide	0	3	6
No. 298. Holman's Current Slide	0	7	6
No. 286. Frog Plate and Silk Bag	0	10	6
No. 290. Fishing Tubes ..	0	1	0
No. 290a. Case for Tubes.. ..	0	1	0
For Pipettes see Appliance Catalogue .. .. .. from	0	0	2
No. 364e. Ehrlich Eyepiece ..	1	0	0
Cedar Oil Bottle (unspillable) ..	0	1	6
No. 410a. Thoma Haemacytometer, 1 Pipette	1	3	0
No. 410b. Do. do. 2 Pipettes	1	10	0
No. 330. Sorby's Microspectroscope Eyepiece	6	6	0
No. 331. Sorby's Spectroscope Object Glass	6	6	0
No. 333. Sorby's Spectroscope, Standard Scale	1	10	0
No. 334. Cells for use with Microspectroscope	0	8	6
No. 332. Sorby's Dichroiscope..	0	15	0
No. 332a. Gem do. ..	0	17	6
No. 384. Polarizing Apparatus..	1	15	0
No. 312. Do. do. with extra large Nicol Prism	3	10	0
No. 312a. Polarizing Apparatus, with extra large Ahren's Prism	4	8	0
No. 314. Selenite Plate on Slip..	0	2	6
No. 322. Tourmaline to fit Eyepiece	1	0	0
No. 316. Darker's Selenite Stage	2	2	0

	£	s.	d.
No. 318. Bundle of Thin Glass Polarizer	1	3	0
No. 344. Leeson's Goniometer..	2	10	0
No. 349. Stage Micrometer, No. 1, Inch	0	5	0
No. 349a. Do. do. No. 2, Millimetre	0	5	0
No. 349b. Stage Micrometer, No. 3, Inch and Millimetre	0	10	0
No. 349c. Stage Micrometer, No. 4, 1 to 10 Thousand	2	2	0
No. 349d. Grayson's Test Ruling	2	2	0
No. 349e. Do. do.	4	4	0
No. 345. Cobweb Eyepiece, Micrometer	4	10	0
No. 346. Jackson's Eyepiece Micrometer	1	0	0
No. 347. Eyepiece Micrometer, to drop in	0	5	6
No. 348. Glass Plate ruled in Squares	0	7	6
No. 864. Wright's Eikonometer	1	1	0
No. 340. Vertical Camera Lucida	0	18	0
No. 342. Beale's Neutral Tint Camera	0	5	6
No. 360. Wollaston's Camera Lucida	0	10	0
No. 341. Wollaston's Camera Lucida with lens	0	15	0
No. 342. Steel Disc Camera Lucida	0	16	6
No. 339. Abbé Camera Lucida..	1	5	0
No. 630. Beck's Revolving Microscope Table	9	5	0
No. 631. Iron centre of above Table	1	7	6
No. 632. Walnut Wood Stand..	1	3	0
Bell Glass Shades for "Star" ..	0	2	6
Do. do. "Imperial"	0	7	6
No. 511. Cover Glass Gauge ..	1	1	0
No. 510. Instrument for cutting Glass Circles	1	13	0
No. 60. Complete Lamp with Herschel Condenser	2	10	0
No. 59. Complete Lamp, as above, in Case	3	5	0
No. 61. Belmontine Oil Lamp ..	0	18	0
No. 62a. Small do. do. ..	0	1	6
No. 63. Case for No. 61 Lamp and 1 Chimney	0	12	6
No. 70. Improved Argand Gas Lamp	1	1	0
No. 69. Incandescent Gas Lamp	1	10	0
Gordon's Speculum Lamp ..	5	10	0
Vertical and Horizontal Photo-micrographic Camera	7	10	0
No. 5140. Photo-micrographic Camera	7	0	0
No. 5141. Do. do.	10	0	0
No. 5144. Right Angle Prism and Elbow fitting for photo-micrographic Camera..	1	10	0
Gordon's Apparatus for Photo-micrography	3	17	6
Beck Harris Yellow Spectrum Filter	0	5	0
Printing Frame	0	0	6
Gelatine Chloride P.O.P. Paper..	0	1	0
Lantern Plates	0	1	0
Masks for Micrography	0	1	0
Box to hold 50 Negatives ..	0	2	6
Beck's Aplanatic Triplet, ×5, 7, 9 or 12	0	11	6
Beck's Combination of Three Lenses in Tortoishell Mount for Pocket	0	11	6
No. 959a. Do. do. in Vulcanite	0	5	6
No. 950a. Erect Image Compound Microscope	1	1	0

R. & J. BECK, Ltd., 68, Cornhill, London, E.C.



The Rosenhain Metallurgical Microscope.

Manufactured by R. & J. Beck, Ltd.

See our list of Metallurgical Microscopes.