MEDALS & AWARDS.

INTERNATIONAL EXHIBITION, 1862,

TWO MEDALS.

DUBLIN INTERNATIONAL EXHIBITION, 1865,

PRIZE MEDAL.

BERLIN INTERNATIONAL EXHIBITION, 1865,

PRIZE MEDAL.

PARIS UNIVERSAL EXHIBITION, 1867,

THE GOLD AND SILVER MEDALS.

"For Astronomical Instruments, Microscopes, and Photographic Lenses."

PHILADELPHIA EXHIBITION, 1876,

HIGHEST AWARD.

"For Telescopes, Microscopes, Photographic Lenses and Apparatus."

PARIS UNIVERSAL EXHIBITION, 1878,

THE CROSS OF THE LEGION OF HONOUR AND TWO GOLD MEDALS.

PARIS EXPOSITION UNIVERSELLE, 1889,

TWO GOLD MEDALS.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION, 1894,

PRIZE MEDAL.

Contractors to Her Majesty's Government.

. . ESTABLISHED 1860 . .

. . INCORPORATED 1892 .

Catalogue

OF

PHOTOGRAPHIC LENSES

AND APPARATUS.

J. H. Dallmeyer, Limited.

OPTICAL MANUFACTORY,

25, Newman Street, Oxford Street,

London, W.

. . Telegraphic and Cable Address:—

. . "DALLMEYER, LONDON." . .

J. PITCHER & CO., NEWMAN ST., LONDON.

REPRODUCED FROM ORIGINAL PHOTOGRAPHS TAKEN WITH THE

Dallmeyer Patent Telephotographic Lens.

PUFFINS Taken from Life.

Awarded a Medal at the Royal Photographic Society's Exhibition, 1895.
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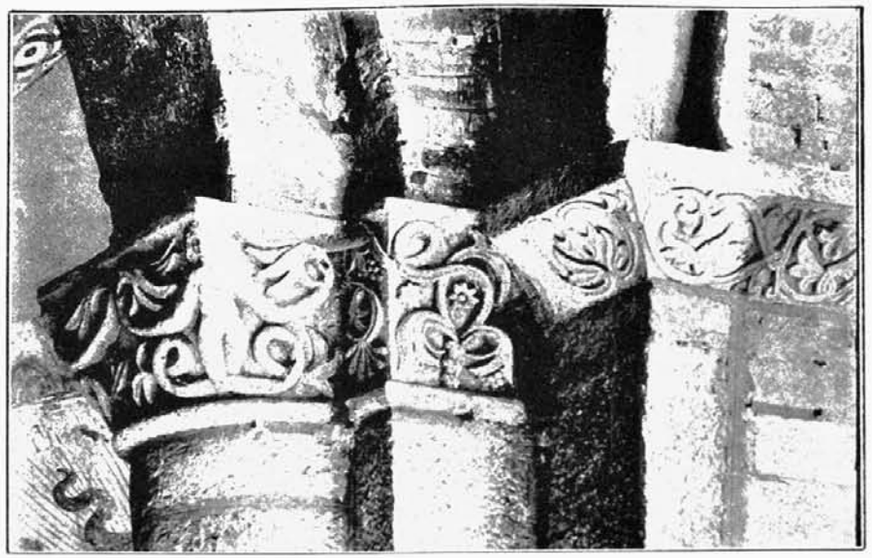

CAPITAL IN THE COURT OF THE CHURCH OF SAINT AMBROSE, MILAN.

Awarded a Medal at the Royal Photographic Society's Exhibition, 1895.
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JANUARY, 1896.

ESTABLISHED 1860.
INCORPORATED 1892.

TELEGRAPHIC AND CABLE ADDRESS:
"DALLMEYER, LONDON."

Catalogue

OF

Photographic Lenses

HAND, FIELD, & STUDIO CAMERAS,

APPARATUS, ETC.,

INCLUDING NOTES & DATA ON THE USE OF TELEPHOTOGRAPHIC LENSES

MADE AND SOLD BY

J. H. Dallmeyer, Limited,

Optical Manufactory,

25, NEWMAN STREET, OXFORD STREET,

LONDON, W.

Telescopes, Field and Opera Glasses,
Microscopes, etc.

SEPARATE CATALOGUE FREE ON APPLICATION

PART I.

Photographic Lenses

INTERNATIONAL EXHIBITION, 1862.—"The Medal has been awarded for the introduction of *Novelties*, as well as *Unsurpassed Excellence* of Manufacture."

PARIS UNIVERSAL EXHIBITION, 1867.—"The Gold and Silver Medals have been *unanimously* awarded to J. H. Dallmeyer."

CENTENNIAL EXHIBITION, PHILADELPHIA, 1876—"Their merits are attested by the extent to which they have been introduced into use in nearly all countries."—*Vide* Jurors' Report.

PARIS UNIVERSAL EXHIBITION, 1878.—"Two Gold Medals and the Cross of the Legion of Honour."

PARIS EXPOSITION UNIVERSELLE, 1889.—"Two Gold Medals."

PHOTOGRAPHIC EXHIBITIONS.—At all prominent Exhibitions a greater average of Medals have been obtained by the use of Dallmeyer Lenses. than by any other make.

CAUTION.

DALLMEYER'S PHOTOGRAPHIC LENSES

Are being extensively imitated, and sold either openly, as "Imitation Dallmeyers," or furtively as genuine Dallmeyer Lenses, both new and secondhand, and fraudulently engraved with the name and address. It is necessary, therefore, to caution the public against the purchase of *spurious* lenses, and to advise Foreign and Colonial Buyers to order direct from the Manufactory, from our accredited Agents, or through dealers of known respectability and standing only. The Company is at all times ready to examine and report on Lenses reputed to be of their manufacture free of charge, providing expenses of carriage be borne by the enquirer.

In sending Orders through Commission Agents, the *description* of the Lenses required should be *distinctly* stated and insisted upon.

All Lenses are supplied with a set of Waterhouse or Iris Diaphragms, or in the form of a rotating Diaphragm Plate, forming part of the Lens Mount, and included in the price of the Lens. The Diaphragms themselves are stamped according to *Dallmeyer's or the Decimal Standard*, the numbers chosen are easily comparable throughout, and form an exact expression of their relative exposures, so that whenever Lenses, or Stops supplied with those Lenses throughout the whole series are required to be compared, a glance at the numbers will be found sufficient.

Each Stop is marked with one of the following numbers, rendering their simplicity of comparison for exposure, beyond all doubt. The equivalent ratio of aperture to focus is appended in brackets:—

·5	(f2·24)	20	(f14·14)
·75	(f2·74)	25	(f15·84)
1·	(f3·16)	30	(f17·32)
1·5	(f3·87)	40	(f20)
2·	(f4·47)	50	(f22·36)
2·5	(f5)	75	(f27·89)
3·	(f5·47)	100	(f31·62)
4·	(f6·32)	150	(f38·73)
5·	(f7·07)	200	(f44·72)
7·5	(f8·66)	250	(f50)
10	(f10)	300	(f54.77)
15	(f12·26)	400	(f63·24)

Lenses can also be marked according to the Photographic Society's Standard, or with the intensity ratio of any apertures that may be chosen without extra charge.

ON THE CARE OF A LENS.

NEVER expose Lenses to the prolonged action of sunlight. Keep them as much as possible in a *dry* atmosphere, and guard against sudden changes of temperature, otherwise some kinds of glass are liable to tarnish, or, what is technically termed to "sweat." Whenever any moisture becomes visible upon any surface, at once remove it by wiping with a *soft* cambric or old silk handkerchief; otherwise resort to wiping *only* when particles of dust adhere so firmly to the glass that they cannot be removed by a camel's hair brush. Never attempt to polish the lenses with any kind of powder whatever.

In this Catalogue the several Lenses are described in the order of their respective rapidity, beginning with those of the *quickest* action. A few remarks upon the capabilities of the various Lenses, as a guide to purchasers, follow in the same order, but for fuller information see *"Dallmeyer on the Choice and Use of Photographic Lenses."* GIVING TABLES FOR EXPOSURE, ENLARGEMENT AND REDUCTION, DEPTH OF FOCUS, &c. PRICE 1/-

DALLMEYER'S "EXTRA" QUICK-ACTING PORTRAIT LENSES.

	Price. Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
No. 2 C PORTRAIT LENS, with rack and pinion movement: the lenses 2¾in. diameter and 4½in. back focus (6in. equivalent), for pictures on plates 4¼ by 3¼ and under	15 0 0	16 5 0
No. 3 C PORTRAIT LENS, with rack and pinion movement, in lenses 3½ in. diameter, 6 in. back focus (8 in. equivalent), for pictures 5 by 4 and under	25 0 0	26 10 0
MINIATURE LENS, with rack and pinion movement, the lenses 1¼ in. and 1⅝ in. diameter respectively, and 2 in. back focus, for pictures 2 in. by 2 in., and when used with stops for 3¼ in. by 2¾ in.	5 10 0	6 0 0
MEDALLION LENS. Diameter of combinations ⅞ in., back focus 1 in., in a rigid mount, without stops	2 7 6	

DESCRIPTION.—No. 2 C and No. 3 C are perhaps the quickest acting Lenses extant, working full aperture at an intensity of *f*2 nearly.

They possess double the rapidity of Nos. 1 B and 2 B Lenses respectively, and are especially suitable for quick portraits of children, or for portraits in the dull light of winter.

When required for *standing* figures, card size, a stop must be used to obtain sufficient flatness of field. In this condition their performance, as regards time of exposure, definition, and distance from subject, is about equal to that of Nos. 1 B and 2 B Lenses.

The **MINIATURE LENS**, suitable for locket portraits, vignette heads, &c., works in about the same time as No. C Lens.

DALLMEYER'S QUICK-ACTING PORTRAIT LENSES

ESPECIALLY CONSTRUCTED FOR

CARTE DE VISITE PORTRAITS.

	Waterhouse Diaphragm £ s. d.	Iris Diaphragm. £ s. d.
No. 1 B CARTE DE VISITE LENS, with rack and pinion movement, the lenses 2 in. diameter and 4½ in. back focus (6 in. equivalent), for Portraits 4¼ by 3¼	6 0 0	6 15 0

5 per cent. discount for Cash with Order

DALLMEYER'S QUICK-ACTING PORTRAIT LENSES.

Continued.

	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
No. 1 B (LONG), with rack and pinion movement, the lenses 2½ in. diameter, and 4⅜ in. back focus (6½ in. equivalent)*	6 10 0	7 5 0

**This Lens is constructed to meet the requirements of Photographers who desire to use a longer focus Lens than No. 1 B, but who have not sufficient length of studio for No. 2 B.*

No. 2 B CARTE DE VISITE LENS, with rack and pinion movement, the lenses 2¾ in. diameter, and 6 in. back focus (8¼ in. equivalent), for Portraits 5 by 4 in.	12 5 0	13 10 0

DESCRIPTION.—These Lenses work, full aperture, at an intensity of *f*3. The distance between subject and lens is for the **No. 1 B**, 12 to 13 ft.; for **No. 1 B (Long)**, 14 to 15 ft.; for **No. 2 B**, 18 to 19 ft. With full aperture **Nos. 1 B** and **2 B** require the same exposure. Since, however, **No. 2 B** covers a larger plate, it can be used for a larger aperture for standing figures, card size. Hence, for this purpose, it becomes practically the quicker acting Lens. The increased distance also between Object and Lens tends to better perspective in the resulting picture. The **1 B (Long)** is a little slower in action than the **1 B**, but for standing figures it produces better results.

The above are the only Lenses now manufactured of the old, or Petzval construction; all other Portrait Lenses of larger dimensions and of the old form, being superseded by DALLMEYER'S PATENT PORTRAIT Series, and the **1 B** and **2 B Patent** are recommended in preference to the **1 B** and **2 B Ordinary Lenses.**

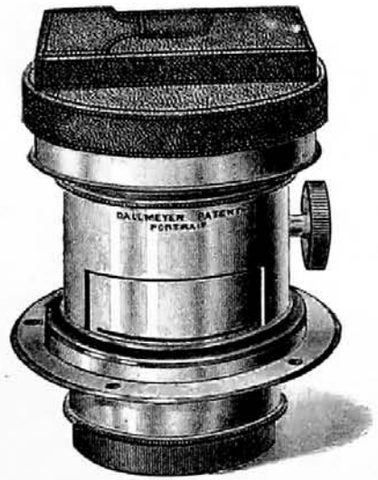
DALLMEYER'S RECTILINEAR PORTRAIT LENS.

	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
No. 1.—With rack and pinion movement. Diameter of Lenses, 2 in., equivalent focus, 6 in.; for Pictures 4¼ by 3¼ inches	7 5 0	8 0 0
No. 2.—With rack and pinion movement. Diameter of Lenses, 2¾ in., equivalent focus, 8½ in.; for Pictures 5 by 4 inches	13 5 0	14 10 0

DESCRIPTION.—These Lenses work at the same intensity as the **Nos. 1 B** and **2 B**, viz., at about *f*3. They are recommended for similar purposes, and give a more brilliant image owing to the smaller number of open surfaces of which they are composed. In optical form they correspond with Dallmeyer's well-known Rapid Rectilinear Lenses, but are between six and seven times more rapid, and, in common with the latter, give perfectly straight lines. Larger sizes are made to order, but are not recommended when Dallmeyer's Patent Portrait Lenses can be employed.

on all Lenses and Apparatus.

DALLMEYER'S
PATENT PORTRAIT LENSES.



Are manufactured of three descriptions, as regards *intensity* or *rapidity* of action.

1st. **QUICK-ACTING PORTRAIT LENSES** (similar to the existing quick-acting Portrait Lenses, Nos. 1 B and 2 B), ratio of aperture to focal length $f3$; designated B.

2nd. **PORTRAIT LENSES** of the ordinary intensity. Ratio of aperture to focus $f4$; designated A.

3rd. **PORTRAIT GROUP and VIEW LENSES.** Ratio of aperture to focus $f6$; designated D.

The denominators of the fractions expressing intensity of the Lenses above mentioned, viz. 3, 4, 6, when *squared*, at once express the relative "time of exposure for each Lens." Thus, B lens requires about *one-half* the exposure of A and *one-fourth* of D.

DESCRIPTION.—These Lenses are constructed on a different principle to the old or Petzval type of Portrait Lenses, and excel them in sharpness of definition, in freedom from distortion and flare, and in equality of illumination; whilst, in addition to this, they afford the means, by the simple turn of a screw, of obtaining greater equality or depth of definition.

The construction of the Lens is such, that with the posterior cell of the back combination screwed *home*, the index pointing zero, it produces the sharpest possible picture of objects situated in *one plane*. Then, by unscrewing the posterior cell a turn, or parts of a turn, the previous intensely sharp definition becomes modified, *i.e.*, the contrast of excessive sharpness in one plane, compared with great want of sharpness in other planes, is balanced, producing the impression of a general distribution or depth of focus; and this in exact proportion to the amount of unscrewing. Nothing has been sacrificed in securing this *new power*, and it *can be used or not* at the *will* of the operator.

Thus a small portrait, *intended for subsequent enlargement must be perfectly and uniformly sharp. In this case the Lens should be used intact*, when the definition surpasses that of the old form of Portrait Lens, and bears enlargement up to

DALLMEYER'S PATENT PORTRAIT LENSES—*Continued.*

life size. If, however, it is required to produce a larger picture *direct* with the same lens, then the posterior lens may be unscrewed just so much as tends to a general harmony of definition. The amount of unscrewing being once recorded, serves for all future occasions.

The advantages of Dallmeyer's Patent Lens for the *larger sizes of pictures* as for Cabinet Portraits and upwards, are at once apparent, enabling the Photographer to produce those evenly defined, soft, and delicate portraits so universally admired.

With respect to the most advantageous use of the Lens, it must be stated that for standing figures, card or cabinet size—subject at a distance of twenty feet—the Lens should be used *intact*; and then, as the picture is taken on a larger scale, or as the subject approaches the lens, the posterior cell should be unscrewed in the proportion of about a quarter of a revolution for every foot of approach of subject. In the case of the D Lenses rather more unscrewing is required to produce an appreciable effect.

IMPORTANT NOTE:—Unscrew *first* and focus *afterwards.*

DALLMEYER'S
PATENT PORTRAIT LENSES (B).

	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm £ s. d.
No. 1 B PATENT LENS, with rack and pinion movement. Diameter of Lenses, 2 in., and equivalent focus, 6 in. For **CARTE DE VISITE PORTRAITS,** *distance between subject and lens for standing figure,* 12 *to* 13 *ft.*	7 0 0	7 15 0
No. 2 B ditto ditto, with rack and pinion movement. Diameter of Lenses, 2¾ in., and equivalent focus 8½ in. Especially constructed for **CARTE DE VISITE PORTRAITS.** *Distance between subject and lens for a standing figure,* 18 *ft.*	12 15 0	14 0
No. 3 B ditto ditto. Diameter of Lenses, 3½ in., and equivalent focus, 10½ in. Especially constructed for the **CABINET PORTRAITS.** *Distance between subject and lens for a standing figure,* 18 *ft.; for Carte de Visite,* 25 *ft.*	19 0 0	20 10 0
No. 4 B ditto ditto. Diameter of Lenses, 4½ in., and equivalent focus, 14 in., for pictures 8½ by 6½, and under. *Distance for a Cabinet Portrait (standing figure)* 25 *ft.*	38 0 0	40 10 0

DALLMEYER'S
PATENT PORTRAIT LENSES (A).

No. 1 A* PATENT LENS, with rack and pinion movement. Diameter of front and back combinations, 2¾ and 2⅝ in. respectively, and 10 in. equivalent focus; for pictures 5 by 4 in.	12 10 0	13 15 0

DALLMEYER'S PATENT PORTRAIT LENSES (A)

Continued.

	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
No. 2 A* PATENT LENS, with rack and pinion movement. Diameter of front and back combinations, 3⅜ and 3¼ in. respectively; 13½ in. equivalent focus; for pictures 6½ by 4¾ in.	17 0 0	18 10 0
No. 3 A* ditto ditto. Diameter of Lenses, 4 in., and 16 in. equivalent focus; for pictures 8½ by 6½ in., and Promenades and Cabinets	26 0 0	27 10 0
No. 4 A ditto ditto. Diameter of Lenses, 4½ in., and 18 in. equivalent focus; for pictures 10 by 8 in., and under	36 10 0	38 10 0
No. 5 A in rigid mount. Diameter of Lenses, 5 in., and 21 in. equivalent focus; for pictures 15 by 12 in., and under	47 10 0	49 10 0
No. 6 A ditto ditto. Diameter of Lenses, 6 in., and 28 in. equivalent focus; for pictures 20 by 16 in., and under	57 0 0	59 10 0

* *These Lenses are well adapted for the Cabinet Portraits, according to length of gallery.—Thus,* **No. 1 A** *requires a distance of 14 feet between subject and Lens (not recommended if a longer focus lens can be used).* **No. 2 A,** *20 feet, and* **No. 3 A,** *24 feet, for a full-length figure.*

DALLMEYER'S PATENT PORTRAIT AND GROUP LENSES (D).

With the exception of **Nos. 2 D and 3 D,** these Lenses are mounted in Rigid setting, *i.e.*, without rack and pinion movement.

5 per cent. discount for Cash with Order

DALLMEYER'S PATENT PORTRAIT AND GROUP LENSES (D)—*Continued.*

No.	Diam. of Lenses.	Equiv. Focus.	Size of Portrait or Group.	Size of View.	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
No. 2 D*	1½ in.	9 in.	6½ × 4¾ in.	8½ × 6½ in.	6 15 0	7 5 0
No. 3 D*	2⅛	12½	8½ × 6½	10 × 8	9 0 0	9 15 0
No. 4 D	2⅞	17	10 × 8	12 × 10	13 0 0	14 5 0
No. 5 D	3¼	19	12 × 10	15 × 12	16 12 6	18 2 6
No. 6 D	4	24	15 × 12	18 × 16	25 5 0	26 15 0
No. 7 D	5	30½	18 × 16	22 × 20	45 15 0	47 15 0
No. 8 D	6	37	22 × 20	25 × 21	55 10 0	58 0 0

* Distance for a full length Cabinet with No. 2 D 15 feet, with No. 3 D 18 feet.

In the above-mentioned lenses, where distances are given between subject and lens, about one-half the distance would be required for head and bust pictures.

GENERAL OBSERVATIONS ON THE FOREGOING LENSES.

THE B LENSES are designed for the smaller-sized plates. Of these, No. 3 B is well adapted for the Cabinet-size Portrait (distance for a standing figure—for cabinets about 18 feet, for cartes 24 feet).

THE A LENSES require nearly double the exposure of the B Lenses; but they are to be preferred for portraits above the ¼-plate size; for being of longer focus they admit of greater distance between the lens and the sitter, giving greater "depth" and better "perspective" in the resulting picture.

No. 3 A is, perhaps, the *best* Cabinet and whole-plate lens that can be possessed by a photographer, if space permit (distance for a cabinet, standing figure, 24 feet). First-class pictures up to 10 × 8 inches are taken with this lens. For larger portraits Nos. 4 A, 5 A, and 6 A should be used; or if price be a consideration, and the studio is *well lighted*, then

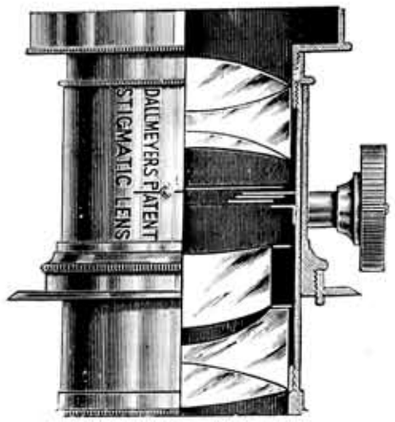
THE D LENSES may be chosen. These require about twice the exposure of the A, and nearly four times that of the B, Lenses. They are more especially designed for groups in the open air, or for "studies" in the studio. For general in-door *every-day* work, they were scarcely sufficiently rapid in action, until the introduction of dry plates, but are now frequently employed in exceptionally well-lighted studios. For out-door subjects, these lenses are *generally* useful, whether for groups, instantaneous effects, architecture, or landscapes; for, in common with all the Patent Portrait Lenses, they are free from a central "flare spot," even when used with the smallest diaphragms; and they are entirely free from distortion.

on all Lenses and Apparatus.

THE DALLMEYER STIGMATIC LENS

(Patented September, 1895).

SERIES I., PORTRAIT LENS, *f*/4.



No.	Largest dimensions of Plate covered at full aperture.	Diameter of Lens.	Equiv. focus.	Back focus.	PRICE. With rack and pinion movement	
					Waterhouse Diaphragm.	Iris Diaphragm.
	In.	In.	In.	In.	£ s. d.	£ s. d.
1	$4\frac{1}{4}\times3\frac{1}{4}$	1·6	$5\frac{1}{2}$	4	7 0 0	7 10 0
2	5 ×4	2·0	$6\frac{3}{4}$	$5\frac{1}{4}$	12 0 0	12 15 0
3	$6\frac{1}{2}\times4\frac{3}{4}$	2·4	$8\frac{1}{4}$	6	18 0 0	19 5 0
4	$8\frac{1}{2}\times6\frac{1}{2}$	3·2	11	$8\frac{1}{4}$	25 0 0	26 10 0

Nos. 1 and **2** are specially adapted for Carte de Visite Pictures, and **Nos. 3** and **4** for Cabinets. It is, however, recommended that the larger size be used in preference, on account of the greater length of focus producing better perspective and "modelling" in the resulting image.

Distance between subject and lens for a Carte de Visite standing figure:—**No 1.**, 11 ft.; **No. 2**, 13-14 ft.; **No. 3**, 17 ft. For a Cabinet standing figure:—**No. 3**, 12-13 ft.; **No. 4**, 17 ft. Head and bust Pictures, about half these distances.

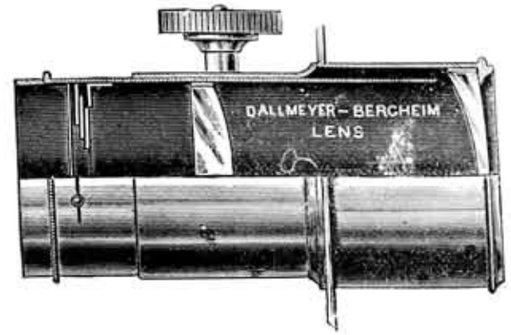
DESCRIPTION.—This Lens has been designed to include a larger angle than existing forms of rapid Portrait Lenses. At the full aperture of *f*4, it is absolutely free from spherical aberration, *i.e.*, gives a perfectly defined image. It is non-distorting, and gives a flat field with equal definition from edge to centre, and with but very slight remaining traces of astigmatism. It covers altogether an angle of about 60°—hence particularly adapted for short operating rooms, and has greater equality of illumination than existing Portrait Lenses.

The Dallmeyer "Stigmatic" Lens is composed of two triple combinations, the whole of the glasses used being of exceptionally white and clear quality, and free from mechanical defects.

Note.—This Lens possesses the same advantage as our "Patent Portrait Lens" system, in that by unscrewing the back cell a turn or part of a turn, a certain amount of spherical aberration is introduced, resulting in more equal distribution of definition over the planes focussed.

THE DALLMEYER-BERGHEIM LENS

(SOFT FOCUS).



No.	Diameter of Front Lens.	Diameter of Back Lens.	Focal Ratio.	Range of Equivalent Foci.	Guide to Camera extension, corresponding *back* foci.	PRICE. With Waterhouse Diaphragms.	PRICE. With Iris Diaphragms.
	In.	In.		In.	In.	£ s. d.	£ s. d.
1	$2\frac{1}{4}$	$2\frac{1}{2}$	*f*/9	20 fixed	10 fixed	5 0 0	6 5 0
2	$3\frac{1}{4}$	$3\frac{1}{2}$	*f*/8 to *f*/12	25 to 4 0	15 to $22\frac{1}{2}$	8 10 0	10 0 0
3	$3\frac{3}{4}$	$4\frac{1}{2}$	*f*/9 to *f*/15	35 to 5 5	12 to 30	10 10 0	12 0 0

Range of separation between front and back lenses:—**No 1** (rigid setting), fixed; **No. 2** (rack and pinion movement), 8 in. to 12 in.; **No. 3** (rack and pinion movement), $10\frac{1}{2}$ in. to 16 in.

No. 1.—Recommended for use on Plates up to Cabinet size.
No. 2.— ,, ,, ,, $8\frac{1}{2}\times6\frac{1}{2}$ in., and upwards.
No. 3.— ,, ,, ,, 10×8 in., and upwards.

DESCRIPTION.—This Lens has been constructed to supply a want frequently expressed by photographers who confine themselves to the production of the highest artistic rendering in portraiture, and is based upon some original experiments undertaken by the well-known artist, Mr. Bergheim.

I is composed of a single front lens of *positive* focus in combination with a single back lens of *negative* focus, the distances between which (with the exception of the **No. 1** size) are variable, thus arriving at a considerable latitude of focal length. The amount of spherical and chromatic aberration purposely given by the single uncorrected lenses, results in a certain amount of diffusion of focus, which produces a softness and delicacy aimed at by Mr. Bergheim himself and other artistic workers. The type of definition given at full aperture is the outcome of a series of experiments, and is such that there is *no destruction of structure* in the resulting image, all detail being given, but softened to an extent that produces a harmonious whole without insisting on critical sharpness. For large heads and life-size studies the lens is invaluable, the great amount of depth of focus conducing to a *uniformity* of definition throughout the planes in which the object lies, and obviating an inherent defect in large portrait lenses constructed to give critical definition, in that these have an insufficiency of depth of focus, one plane in the image being very much better defined than the others.*

The Lenses differ from any hitherto introduced for Portraiture, in that they are throughout longer in focus, hence producing more satisfactory perspective. As stated, they are of variable focal length, and that within considerable limits, as may be seen from the data given, and being constructed on the Telephotographic principle, have also *varying covering power*. There is no limit to the size of the

* These remarks apply particularly to the Petzval type of Portrait Lens, but are to be considerably modified in our Patent form, in which the means of spherical aberration is under control.—*Vide page* 8.

THE NEW DALLMEYER-BERGHEIM LENS—*Continued.*

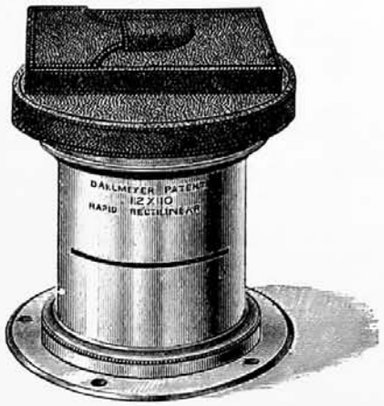
image that can be produced, this being merely a question of camera extension, *the same instrument giving images from Cabinet to life-size.* Examples of the wide limits in the power of the lens may be seen at 25, Newman Street.

This lens is perfectly free from distortion, and covers the plate with uniform definition from centre to edge. The fact of the positive and negative elements being composed of *single* lenses also conduces to relatively greater rapidity and brilliancy of image as compared with multiple instruments.

STOPPED DOWN, DEFINING POWER AND SHARPNESS INCREASE, THIS BEING ABSOLUTE WITH ABOUT ONE-THIRD THE FULL APERTURE.

EXPOSURE varies with different extensions of camera. The following is recommended as the readiest method at arriving at the *f* ratio for the time being. Note the camera extension when lens is focussed on a *distant* object. If now focussed on the object in the studio, it will be found that the camera back has to be racked out; add the amount thus racked out to the equivalent focus for the time being—*this equivalent focus is engraved on the mounting of the lens for various separations between positive and negative elements*—and the temporary focus thus found, divided by the aperture of the stop used, gives the focal ratio or guide to exposure. The diaphragm notation is merely a measurement of the various stops in inches and parts of an inch.

EXTRA RAPID RECTILINEAR LENSES.



No.	Largest Dimensions of Plate.	Diam. of Lens.	Equivalent Focus.	PRICE. Waterhouse Diaphragm.	Aluminium Setting.	Extra for Iris Diaphragm.
		In.	In.	£ s. d.	£ s. d.	£ s. d.
1	5 × 4	$\frac{7}{8}$	4·9	5 15 0	6 5 0	0 7 6
2	6 × 5	$1\frac{1}{4}$	6·9	7 0 0	7 10 0	0 7 6
3	8 × 5	$1\frac{3}{8}$	7·6	8 0 0	9 0 0	0 10 0
4	$8\frac{1}{2}$ × $6\frac{1}{2}$	$1\frac{1}{2}$	8·4	9 0 0	10 0 0	0 10 0
5	9 × 7	$1\frac{5}{8}$	9·1	11 0 0	12 0 0	0 15 0
6	10 × 8	$1\frac{3}{4}$	9·8	13 0 0	14 5 0	0 15 0
7	12 × 10	2	11·2	15 0 0	16 5 0	0 15 0

DESCRIPTION.—The Extra Rapid Rectilinear Lenses work at an intensity of *f*5·9; they are made of specially tested Jena glass, and are aplanatic. They produce very sharp and brilliant images, and are most suitable for instantaneous work in dull weather, when the intensity of *f*8 is not sufficient.

5 per cent. discount for Cash with Order

EXTRA RAPID RECTILINEAR LENSES—*Continued.*

These Lenses can therefore be used both for in-door and out-door work, but for studio work the D Lenses are recommended in preference, owing to the extra power producing greater depth of focus.

Larger sizes of these Extra Rapid Rectilinear Lenses can be had to order, but above the 12 × 10 size the ordinary Rapid Rectilinear should be chosen in preference. Nos. 1, 2 and 3 are unsurpassed for Hand Camera work.

DALLMEYER'S
RAPID RECTILINEAR LENS (Patent).

No.	Size of View or Landscape	Size of Group or Portrait.	Diam of Lens.	Eqiv. Focus	PRICE. Rigid Setting.	With Rack and Pinion Adjustment.	Aluminium Settings. Rigid.	Iris Diaphragms Extra.
			In.	In.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	*$4\frac{1}{4}$ × $3\frac{1}{4}$	$3\frac{1}{4}$ × $3\frac{1}{4}$	$\frac{5}{8}$	4	3 10 0	4 5 0	3 17 6	0 7 6
2	*5 × 4	$4\frac{1}{4}$ × $3\frac{1}{4}$	$\frac{3}{4}$	6	4 5 0	5 0 0	4 15 0	0 7 6
3	$6\frac{1}{2}$ × $4\frac{3}{4}$	5 × 4	$1\frac{1}{4}$	$8\frac{1}{4}$	5 5 0	6 5 0	5 15 0	0 7 6
4	8 × 5	6 × 5	$1\frac{3}{8}$	10	6 0 0	7 0 0	7 0 0	0 10 0
5	$8\frac{1}{2}$ × $6\frac{1}{2}$	7 × 5	$1\frac{1}{2}$	11	6 12 6	7 12 6	7 12 6	0 10 0
6	10 × 8	$8\frac{1}{2}$ × $6\frac{1}{2}$	$1\frac{5}{8}$	13	8 10 0	9 15 0	9 15 0	0 15 0
7	12 × 10	10 × 8	2	16	10 10 0	11 15 0	11 15 0	0 15 0
8	13 × 11	11 × 9	$2\frac{1}{4}$	17	11 10 0	13 0 0	12 15 0	0 15 0
9	15 × 12	12 × 10	$2\frac{1}{2}$	$19\frac{1}{2}$	14 5 0	15 15 0	15 12 6	1 5 0
10	18 × 16	15 × 12	3	24	19 0 0	20 15 0	20 10 0	1 10 0
11	22 × 20	18 × 16	$3\frac{3}{4}$	30	25 15 0	27 10 0	27 5 0	1 10 0
12	25 × 21	22 × 20	4	33	31 10 0	33 15 0	33 0 0	1 10 0

EACH LENS, WITH SMALLER STOPS, CAN BE USED FOR THE NEXT SIZE LARGER DIMENSION OF PLATE.

The $4\frac{1}{4}$ × $3\frac{1}{4}$ Lenses are constructed for lantern pictures.

* Pairs of $4\frac{1}{4}$ × $3\frac{1}{4}$ and 5 × 4 Rapid Rectilinears constitute most useful sets of Lenses for quick outdoor stereo views, &c., and are preferred by many photographers for this class of pictures.

To obtain the best results with the sizes above 10 × 8, ALWAYS FOCUS *with the third* stop, *whether the photograph is to be taken with a smaller or larger one.*

These Lenses are constructed for still greater dimensions of plates than those quoted, but specially to order.

DESCRIPTION.—**THE RAPID RECTILINEAR LENS** is emphatically "The" Lens for all kinds of out-door photography.

It works at an intensity of *f*8 and, although not so rapid as the D Lens, requiring nearly double the exposure, is *superior* to it for views, because of its having only *four*, instead of six, reflecting surfaces. It is composed of two, exactly symmetrical, cemented combinations; and, unlike many existing double combination cemented lenses, requiring small stops to cure the inherent excessive spherical aberration, the Rapid Rectilinear is aplanatic, *i.e.*, it works with the *full opening.* With open aperture this Lens possesses about *twice* the rapidity of the Triple Achromatic, or of the Petzval Lenses. Hence its superiority for all kinds of *quick* out-door pictures, whether for groups, instantaneous effects, landscapes, architectural subjects, or dimly-lighted interiors. That this Lens is perfectly aplanatic is proved by the excellently defined and valuable records of the *Solar Eclipses;* several 25 × 21 R. R. Lenses having been supplied to these expeditions, and pictures obtained with the full aperture. Specially constructed Lenses of six inches diameter, and of this form, have been supplied to various observatories, for the modern work of Stellar Photography.

on all Lenses and Apparatus.

DALLMEYER'S RAPID RECTILINEAR LENS (Patent).

Continued.

For copying and enlarging this lens is well adapted. It has been supplied to the Home and Foreign Government Topographical Departments, Ordnance Surveys, &c., and is extensively employed in the chief photo-lithographical establishments throughout the world. It will be found unsurpassed for producing the finest results for every variety of Photo-Mechanical Work.

With smaller stops each lens covers the next larger, or even two sizes larger plates than those recorded, thus embracing angles of pictures of from sixty to eighty degrees; and this without any trace of flare or central spot.

Although the Rapid Rectilinear is not quick enough for *ordinary* Studio portraiture, many fine large Portrait-Studies have been taken with this lens. Yet for *one* Lens for general purposes, it is perhaps the most useful instrument a Photographer can possess.

Either combination of the Rapid Rectilinear *can* be used singly as an ordinary landscape lens; focus about double that of the compound lens.

SPECIAL HAND-CAMERA R.R.

No. 1A.—Equiv. focus, 5¼ in., price in Rigid Setting .. £3 15 0
in Rack and Pinion Movement £4 10 0
Aluminium Setting .. extra £0 10 0
Iris Diaphragm .. .. „ £0 7 6

Unless otherwise ordered, this Lens is sent out in Bronzed Mounts.

The 5 × 4 Rapid Rectilinear is also extremely suitable for Hand-Camera work.

DALLMEYER'S TRIPLE ACHROMATIC LENS.

No.	Size of View or Landscape.	Size of Group or Portrait.	Diameter of back combination.	Back Focus	PRICE. Rigid Setting.	With Rack and Pinion.	Iris Diaphragm extra.
	Inches.	Inches.	In.	In.	£ s. d.	£ s. d.	£ s. d.
1	6½ × 4¾	5 × 4	1½	7	4 0 0	5 0 0	0 10 0
2	8½ × 6½	6½ × 4¾	2	10	5 15 0	6 15 0	0 15 0
3	10 × 8	8½ × 6½	2½	12	6 15 0	7 15 0	0 15 0
4	12 × 10	10 × 8	2¾	15	9 0 0	10 0 0	1 5 0
5	15 × 12	12 × 10	3¼	18	11 10 0	12 10 0	1 10 0
6	18 × 16	15 × 12	4	23	14 15 0	16 0 0	1 10 0
7	22 × 20	18 × 16	5	29	21 0 0	22 10 0	2 0 0
8	25 × 21	22 × 20	5¼	31	23 15 0	25 5 0	2 0 0

DESCRIPTION.—THE TRIPLE ACHROMATIC LENS, was reported upon most favourably by the Jurors of the International Exhibition of 1862. It has been in extensive use ever since, and its particular qualities are known to almost every photographer. It was the first aplanatic non-distorting view lens placed within the reach of the profession; and until the introduction of the Rapid Rectilinear Lens it was probably the best lens extant for copying purposes, architectural views, &c.

It works at an intensity of *f*10, but being a triple combination has six reflecting surfaces, hence it is recommended that the Rapid Rectilinear be used in preference; many photographers however still employ it.

5 per cent. discount for Cash with Order

DALLMEYER'S RAPID (LONG FOCUS) LANDSCAPE LENS.

Specially constructed for views and distant objects, mountain scenery, balloon photography, &c., &c. Each lens is supplied with Iris or Waterhouse Diaphragms; the apertures of which are too large to admit of their arrangement in the form of a *Rotating* Diaphragm, as supplied with the "Wide Angle" Landscape Series.

No.	Largest Dimensions of Plate.	Diameter of Lenses.	Equivalent Focus.	PRICE. Waterhouse Diaphragms.	Iris Diaphragms.
	Inches.	Inches.	Inches.	£ s. d.	£ s. d.
1AA	4¼ × 3¼	1	5	3 0 0	3 10 0
1A	5 × 4	1¼	7	3 15 0	4 5 0
1	6½ × 4¾	1½	9	4 5 0	5 0 0
2	8½ × 6½	2	12	5 10 0	6 5 0
3	10 × 8	2½	15	7 5 0	8 0 0
4	12 × 10	2¾	18	9 0 0	10 0 0
5	15 × 12	3	22	11 0 0	12 0 0
6	18 × 16	3½	25	13 5 0	14 15 0
7	22 × 20	4¼	30	16 15 0	18 5 0

DESCRIPTION.—These lenses work at an intensity of somewhat more than *f*12 (or about twice as quick as the Wide Angle Landscape Lens), and in this condition, are entirely free from outstanding spherical aberration, *i.e.*, give a perfectly defined image.

Note.—These lenses may be used in some cases advantageously at a still greater intensity of *f*10 for (being the full aperture) large portrait heads for example; but as a View Lens, where perfect definition is essential, they should not be used without a stop limiting the itensity to *f*12. This form of lens was originally constructed for General Count Nostitz, who asked for a rapid objective for views which should give "what the eye sees in perfect rendering, and eliminate the large visual angles which amplify the nearer planes to the detriment of perspective." Like the Wide Angle Landscape series, they are *particularly* adapted for landscape work, and give very brilliant negatives.

on all Lenses and Apparatus.

DALLMEYER'S
RECTILINEAR LANDSCAPE LENS
(PATENT).

No.	Largest Dimensions of Plate.	Diameter of Lenses.	Equivalent Focus.	PRICE. Waterhouse Diaphragms.	PRICE. Iris Diaphragms.
	Inches	Inches	Inches	£ s. d.	£ s. d.
1	6½ × 4¾	1½	8½	4 10 0	5 5 0
2	8½ × 6½	1¾	11½	5 15 0	6 10 0
3	10 × 8	2	13½	7 15 0	8 5 0
4	12 × 10	2¼	16½	9 15 0	10 10 0
5	15 × 12	2¾	20	12 0 0	13 0 0
6	18 × 16	3	25	15 5 0	16 10 0
7	22 × 20	3¼	32	20 0 0	21 5 0

DESCRIPTION.—This lens works an intensity with the first stop of *f*14, and is therefore somewhat slower in action than the preceding series, requiring an exposure of about ½ longer, and similarly to those lenses, may be used with a larger aperture than the first stop. It is particularly constructed for views, architectural subjects, copying, &c., where it is essential that straight lines should be accurately portrayed, and has been constructed specially to meet this long-felt want in the form of a single combination.

DALLMEYER'S
WIDE-ANGLE LANDSCAPE LENS (Patent).

The lenses are mounted in rigid tubes or settings, with rotating stops or Iris Diaphragm.

No.	Size of Plate.	Diameter of Lenses.	Equivalent Focus.	PRICE. Rotating Stop.	PRICE. Iris Diaphragm.
	Inches	Inches	Inches	£ s. d.	£ s. d.
1A	5 × 4	1⅜	5¼	3 0 0	3 10 0
1	7 × 5	1½	7	3 10 0	4 0 0
2	8½ × 6½	1⅝	8½	4 5 0	4 15 0
3	10 × 8	2⅛	10	5 5 0	5 15 0
4	12 × 10	2½	12	6 15 0	7 10 0
5	15 × 12	2⅞	15	8 0 0	9 0 0
5A	15 × 12	2⅞	18	9 0 0	10 0 0
6	18 × 16	3	18	10 0 0	11 0 0
7	22 × 20	3⅝	22	13 5 0	14 15 0
8	25 × 21	4¼	25	18 0 0	19 10 0

5 per cent. discount for Cash with Order

DALLMEYER'S WIDE-ANGLE LANDSCAPE LENS (Patent).
Continued.

Larger sizes than the above can be constructed to order. Photographs, 30 × 24in., taken direct with a lens of this series can be seen at the Company's offices.

DESCRIPTION.—**THE WIDE-ANGLE SINGLE COMBINATION LANDSCAPE LENS** works at an intensity of *f* 15, and is the best lens for landscape, pure and simple, embracing large angles. It is now generally admitted that landscapes are the only legitimate subjects for wide-angle lenses. For work of this kind the above lens is superior to the several wide-angle multiple lenses; because being a *single* combination, like the Rapid Landscape, it has but *two* reflecting surfaces, and therefore produces more brilliant pictures. It works with a proportionately larger stop, *i.e.*, it is quicker in action, and the illumination is more equally distributed from the centre to the margin of the plate. Its only drawback is a slight distortion of straight marginal lines; but by a judicious selection of subjects comprised in a picture, as by making architectural objects occupy the centre, this defect need not obtrude itself *in a landscape*.

Being composed of *three* lenses cemented together, it is superior to the old Meniscus, composed of *two*, inasmuch as it produces less distortion, gives better marginal definition, and is of much smaller size.

DALLMEYER'S
WIDE-ANGLE RECTILINEAR LENS
(PATENT).

The Lenses are mounted in *rigid* tubes or settings, with rotating stops or Iris diaphragm. In the column below, the largest size of plate covered by each Lens is recorded; and if *microscopic* definitions up to the margins be required, the smallest, or smallest but one, stop, should be used.

No.	Largest Dimension of Plate.	Diameter of front Combination.	Back Focus.	Equivalent Focus.	PRICE. Rotating Stop.	PRICE. Iris Diaphragm.
	Inches.	Inches.	Inches.	Inches	£ s. d.	£ s. d.
*1AA	7 × 5	⅞	3⅛	4	4 5 0	4 12 6
1A	8½ × 6½	1⅛	4⅛	5¼	5 5 0	5 12 6
1B	10 × 8	1⅜	5¼	6¾	6 5 0	6 15 0
1	12 × 10	1½	6¾	7	7 5 0	7 15 0
2	15 × 12	2	7⅞	8½	10 0 0	10 10 0
3	18 × 16	2½	11	13	13 5 0	14 0 0
4	22 × 20	3	14	15¼	19 0 0	20 0 0
5	24 × 21	3¾	17	19	28 10 0	29 15 0

**This Lens is also well adapted for Stereoscopic Views.*

on all Lenses and Apparatus.

DALLMEYER'S
WIDE-ANGLE RECTILINEAR LENS (Patent)

Continued.

DESCRIPTION.—THE WIDE-ANGLE RECTILINEAR LENS (Patent) is the next in the order of rapidity, working at an intensity of *f*16. This Lens embraces angles of pictures *of nearly* 100 when used with the smallest stop. It is entirely free from distortion and flare; and although not aplanatic like the *Rapid Rectilinear*, it works with perhaps a larger opening than most of the existing wide-angle double combination Lenses.

The wide-angle Rectilinear Lens is intended for interiors and architectural views, landscapes, &c., in *confined* situations, where longer focus lenses cannot be used, and for these purposes its advantages have been universally recognized.

For general purposes, however—more especially for architecture—the use of wide-angle lenses is *not to be commended*; inasmuch as pictures produced by them, when viewed at the ordinary distance of vision, *i.e.*, from 12 to 14 inches, *appear* distorted—that is foreground objects are exaggerated, and the distance is dwarfed. This is really no fault of the lens, as will be evident on looking at the picture from a point, the distance of which is exactly equal to the focal length of lens with which it was taken; but the general public cannot be expected to view the picture from this point—and hence great discrimination in the use of these lenses is imperative.

Another point requiring the strictest attention is, that the camera be placed exactly *square* and *level*. If *tilting* is necessary, then a swing back must be used, allowing the camera-screen or slide to be brought *parallel* to the plane of the object, otherwise all straight and parallel lines will be represented converging, *i.e.*, the tops of buildings will appear as if falling together. The use of the swing-back, however, also necessitates a smaller stop, hence, if possible, the camera should be kept level, the front raised as much as possible; and if this be found insufficient, then a higher elevation wherefrom to take the picture should be chosen. These observations equally apply to the use of all other non-distorting Lenses.

The front combination of the wide-angle Rectilinear can be used intact dispensing with the back, as a single lens (focal length about double that of the compound lens). Photographers not in possession of single combination lenses will find this an acquisition.

Stereoscopic Lenses.

DALLMEYER'S
PATENT STEREOGRAPHIC LENS.

This Lens is entirely free from distortion and flare, and is specially recommended for "Instantaneous Views," Small Portraits, Groups, &c.

Diameter of front and back combination 1½in. and 1¾in. respectively, and 3⅝in. focus from the back glass (equivalent focus 5 inches).

	Waterhouse Diaphragm. £ s. d.	Iris Diaphragm. £ s. d.
In rigid setting	3 10 0	4 0 0
In sliding mount adjustment	4 0 0	4 10 0
With rack and pinion movement	4 10 0	5 0 0

5 per cent. discount for Cash with Order

DALLMEYER'S PATENT STEREOGRAPHIC LENS

Continued.

This Lens has the advantage of covering a stereo-plate more perfectly than the older forms of Stereoscopic Multiple Lenses, and is entirely free from distortion and flare, even when used with the smallest diaphragm. It works at an intensity of *f*4, and the construction is the same as that of the Patent Portrait Lens, *viz.*, the posterior lens is moveable for depth of definition, though seldom required for this purpose, for small pictures, which should be as *sharp* as possible. This lens will be found very useful for Instantaneous Pictures, as transparencies for the Optical Lantern.

N.B.—The front combination can be used alone and *intact* (focal length, 8 inches), simply by unscrewing and dispensing with the back combination, when, with a small-sized stop, it will be found to cover the 7 × 5in. plate.

In very short Operating Rooms, this Lens can also be used for CARTE PORTRAITS.

THE RAPID RECTILINEAR LENS FOR STEREOSCOPIC PURPOSES. *See page* 15.

DALLMEYER'S
QUICK-ACTING STEREO LANDSCAPE LENS.

	£ s. d.
No. 1.—1¼in. diam., 4½in. focus, in rigid mount, with rotating stops ..	2 0 0
No. 2.—1½in. diam., 6in. focus, in rigid mount, with rotating stops ..	2 5 0
No. 3.—1⅝in. diam., 8in. focus, in rigid mount, with rotating stops ..	2 10 0

DESCRIPTION.—These lenses are used by all the first photographers; and for *general landscapes, quick marine views, &c.*, they are to be preferred above all others. Even for architectural stereo views they are employed by some photographers, because the distortion produced by them is neutralised, when the picture is viewed in the stereoscope, by the opposite distortion always produced by that instrument. That the lenses are quick in action is sufficiently demonstrated by the well-known *instantaneous* marine views by many of our best workers. And although not so rapid as the double combination lenses, referred to above, when these are used with the full opening, yet the single combination produces a more *evenly*-defined and *brilliant* picture. The shorter focus, 4½ inch, includes a larger angle than the 6 inch, and if only one pair be required, is to be preferred.

These lenses have been shown to work at an intensity of *f*8, but are sent out in their most perfect form, working at an intensity of *f*10.

DALLMEYER'S
PATENT RECTILINEAR STEREO LENS.

	£ s. d.
DIAMETER OF FRONT COMBINATION, ⅝in. (equivalent focus, 3in.); mounted in rigid setting, with *rotating* diaphragm plate; the largest aperture of which has an intensity of $\frac{1}{10}$, price, each	3 15 0
A RECTILINEAR LENS (of equivalent focus, 2½in.), constructed for Tourists' *Pocket* Cameras; size of plate, 3¼ × 2⅝ins. ..	3 15 0
Ditto, ditto, equivalent focus, 2in.	3 15 0

on all Lenses and Apparatus.

DALLMEYER'S PATENT RECTILINEAR STEREO LENS.

Continued.

THE RECTILINEAR STEREO LENS (Patent) of 3 inch equivalent, or 2½ inch back focus, is especially constructed for architectural views, interiors, and landscapes *in confined* situations, where longer focus lenses cannot be used. It covers the stereo plate with the full opening and with smaller stops, plates up to 5×4 inches. That this lens is of great use for special purposes, is recognised by all the first photographers, who are already using it.

Either the front or back combination cas be used *singly*, as a 6 inch view lens.

If a slightly greater focal length than the above Rectilinear Stereo be preferred, then a pair of No. 1aa. Rectilinear Lenses of 4 inch focus are recommended. One of these lenses, when used with small stops, covers the 7 × 5 inch plate.

All Lenses can be supplied in Aluminium Mounts at an additional cost of 20 to 25 per cent.

Iris Diaphragms fitted to Old Lenses from 12s. 6d.

DALLMEYER'S PATENT TELEPHOTOGRAPHIC or "LARGE IMAGE" LENSES and ATTACHMENTS.*

Caution.

The form of negative element originally constructed for these Lenses, and consisting of a single triple cemented combination, was discarded a few months after it was introduced, for reasons then described. This single form has, however, since been brought forward as a "Novelty" when applied to Rapid Rectilinears, and termed "A New Telephotographic Instrument."

THE TELEPHOTOGRAPHIC LENS is now recognised as forming an essential part of the photographer's outfit. By its use, the necessity of carrying a battery of lenses of various foci for landscape

* "The Telephotographic Lens," by T. R. Dallmeyer, containing a full description of the theoretical and practical construction of the lens, together with copious notes, press reports, etc., and six full-page collotype illustrations. Price 1s. Published at the offices of the Company.

5 per cent. discount for Cash with Order

work is in a great measure avoided, and the advantages it gives in photographing at distances which were impossible beforeneed scarcely be enlarged upon. As an instance of what *can* be done with the lens, it is only necessary to refer to the celebrated Photograph of "Mont Blanc," by Boissonnas. The mountain was photographed at a distance of *nearly* 50 *miles*, an amplification of 36 diameters being obtained. For obtaining details in architectural subjects, the lens has proved itself of very great value, as also in obtaining much happier perspective by photographing from a more distant standpoint than would ordinarily give a sufficient size of image, the operator having—within certain limits—a very considerable range of foci at his disposal to make the subject as large as he chooses.

The immense advantage obtained by direct telephotographic work over enlargement has been proved by several independent authorities. The utility of the lens to the mountaineer, the naturalist, and others, will suggest itself, and has been amply proved. More recently the delineations of bird life in a wild state, by Mr. R. B. Lodge, as also by Mr. Kearton (Cassell & Co.), test to its value for *instantaneous* work. In short, its application may be extended to within very wide limits, varied uses such as Military Balloon photography, and the portrayal of surgical cases in hospital being quite feasible.

In itself, the Telephotographic Lens is essentially merely a Long Focus (though variable) Lens, and its behaviour, as regards depth of focus, perspective, &c., *differs in no way from that of ordinary Long Focus Lenses*. There are, however, two important points of difference between a Telephoto Lens and a merely Long Focus Lens.

I. The *back focus* of a Telephotographic Lens (when set to give a much greater *equivalent focus*) is much shorter than in an ordinary lens of the same equivalent focus.

II. The *equivalent focus* of a Telephoto Lens can be made to vary within wide limits by a comparatively slight adjustment of its component parts.

There is no necessary connection between back (or actual distance between lens and focussing screen) and equivalent focus, but whilst the matter is—for distant objects—practically equal to the equivalent focus in an ordinary lens system, in a Telephotographic Lens the *equivalent* is a certain multiple of the *back* focus, this multiple being practically constant for any one type of Telephoto Lens and not appreciably altering with the circumstances under which it is used.

on all Lenses and Apparatus.

The Telephoto Lens consists essentially of a fixed *positive* focus lens system in front, with a fixed *negative* focus system behind, the distance between the two being adjustable, and the alteration of this distance giving a large range of equivalent or corresponding foci, thus enabling the operator to obtain different sized images of one and the same object at a given distance, and greatly magnified as compared with the size of image given by the positive lens employed alone. The *degree* of magnification depends on the type of Telephoto Lens used, varying with the ratio between the focus of the positive lens and the focus of the negative lens used in conjunction with it.

The lenses are supplied of three different types, the negative elements consisting (except in one instance, where unsymmetrical lenses are employed) of *two symmetrical double cemented combinations*, mounted in close proximity to one another. By the employment of the greater number of elements (the original form of negative introduced being a *single* combination) greater excellence in the results is attained, and distortion is reduced to a minimum, or practically eliminated. The lenses are necessarily more bulky than an ordinary objective, but mounted in aluminium are quite light, the approximate weights of the No. 1, No. 2, and No. 3 Portrait Lens combinations being 11, 17, and 29 ounces, a considerable saving as compared with brass mounts.

I. HIGH POWER. Consisting of a Portrait Lens and a high power negative of about one-fourth the focus of Portrait Lens.

	Mounted in Brass. £ s. d.	Mounted in Aluminium. £ s. d.
No. 1. PATENT STEREO LENS, with Iris Diaphragms, and No. 1 Negative (1·6in. focus) ..	7 15 0	9 5 0
No. 2. 1½B PATENT PORTRAIT LENS, with Iris Diaphragms, and No. 2 Negative (1·8in. focus) ..	11 10 0	13 17 6
No. 3. 2 B PATENT PORTRAIT LENS, with Iris Diaphragms, and No. 3 Negative (2·4in. focus)..	18 17 6	21 2 6

5 per cent. discount for Cash with Order

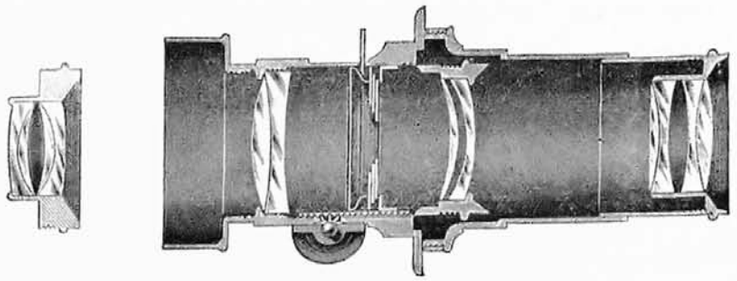
THE TELEPHOTOGRAPHIC LENS.

Extract from **"THE SHASHIN-SOWA"** *(Japanese Photographic Monthly Journal), edited by Y. ISAWA.*

"MESSRS. DALLMEYER'S Telephoto Lens was first used in war during the Japan and China conflict. The lens gave most remarkable result on this occasion. In the case of war it is not seldom necessary to take distant objects. Among many of the pictures taken with this lens, our attention was specially attracted to one of a Chinese vessel, struck by a torpedo, and lying half sunk far beyond the reach of any ordinary lens. The picture gave every detail of the result of cannon shots and of torpedoes."

Prices of larger sizes on application.

COMBINATION OF I. AND II. Only one negative mount is required, this being constructed telescopically so as to carry either a high or a moderate power element (each in its respective cell), the latter necessitating a slight shortening of tube.



High-power Negative. No. 1. Moderate power Telephoto Lens.

	Mounted in Brass. £ s. d.	Mounted in Aluminium. £ s. d.
No. 1. PATENT STEREO LENS, with Iris Diaphragms, and a high and moderate power Negative Element	10 15 0	12 5 0
No. 2. 1 B PATENT PORTRAIT LENS, with Iris Diaphragms, and a high and moderate power Negative Element	14 10 0	16 17 6
No. 3. 2 B PATENT PORTRAIT LENS, with Iris Diaphragms, and a high and moderate power Negative Element	22 12 6	24 17 6

* "Telephotographic Detective Lens."

on all Lenses and Apparatus.

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No. 3 Portrait Lens combinations
unces, a considerable saving as compared with

I. HIGH POWER. Consisting of a Portrait Lens and a high power negative of about one-fourth the focus of Portrait Lens.

	Mounted in Brass. £ s. d.	Mounted in Aluminium. £ s. d.
No. 1. PATENT STEREO LENS, with Iris Diaphragms, and No. 1 Negative (1·6in. focus) ..	7 15 0	9 5 0
No. 2. 1 B PATENT PORTRAIT LENS, with Iris Diaphragms, and No. 2 Negative (1·8in. focus) ..	11 10 0	13 17 6
No. 3. 2 B PATENT PORTRAIT LENS, with Iris Diaphragms, and No. 3 Negative (2·4in. focus)..	18 17 6	21 2 6

5 per cent. discount for Cash with Order

The negative elements alone can be adapted to any existing Patent stereo, 1 B, or 2 B Patent Portrait Lenses at the following prices:—

		£ s. d.		£ s. d.
No. 1.	NEGATIVE	In Brass 2 15 0	In Aluminium	3 5 0
No. 2.	Do.	do. 3 15 0	do.	4 17 6
No. 3.	Do.	do. 4 17 6	do.	5 12 6

II. MODERATE POWER. Consisting of a Portrait Lens and a moderate power negative of about half the focus of Portrait Lens.

	Mounted in Brass. £ s. d.	Mounted in Aluminium. £ s. d.
No. 1.* PATENT STEREO LENS, with Iris Diaphragms, 2½in. focus negative	8 10 0	10 0 0
No. 2. 1 B PATENT PORTRAIT LENS, with Iris Diaphragms, and 3in. focus negative	11 5 0	13 2 6
No. 3. 2 B PATENT PORTRAIT LENS, with Iris Diaphragms, and 4in focus negative	18 5 0	20 10 0

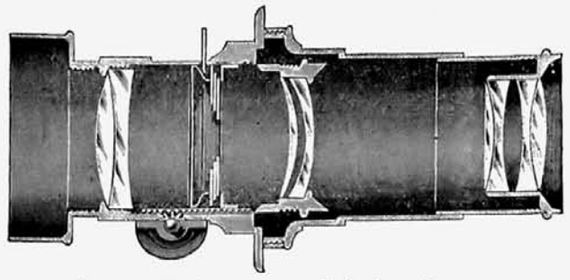
The negative elements alone can be adopted to any existing Patent Stereo, 1 B, or 2 B Patent, or similar Portrait Lenses at the following prices:—

		£ s. d.		£ s. d.
2½in.	NEGATIVE	In Brass 3 10 0	In Aluminium	4 0 0
3 in.	Do.	do. 3 10 0	do.	4 2 6
4 in.	Do.	do. 4 5 0	do.	5 0 0

Prices of larger sizes on application.

COMBINATION OF I. AND II. Only one negative mount is required, this being constructed telescopically so as to carry either a high or a moderate power element (each in its respective cell), the latter necessitating a slight shortening of tube.

High-power Negative.



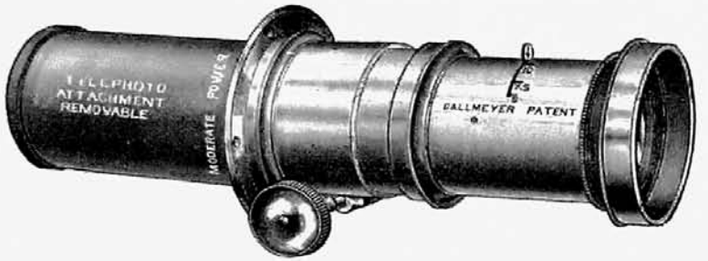
No. 1. Moderate power Telephoto Lens.

	Mounted in Brass. £ s. d.	Mounted in Aluminium. £ s. d.
No. 1. PATENT STEREO LENS, with Iris Diaphragms, and a high and moderate power Negative Element	10 15 0	12 5 0
No. 2. 1 B PATENT PORTRAIT LENS, with Iris Diaphragms, and a high and moderate power Negative Element	14 10 0	16 17 6
No. 3. 2 B PATENT PORTRAIT LENS, with Iris Diaphragms, and a high and moderate power Negative Element	22 12 6	24 17 6

* "Telephotographic Detective Lens."

on all Lenses and Apparatus.

III.—MODERATE POWER. Consisting of an R.R. Lens and a moderate power Negative of about half its focus.



The prices of the Negative Elements alone are here given. As the Positive Element, either the "Rapid Rectilinear" or the "Extra Rapid Rectilinear" may be employed (for prices see pages 14 and 15). Each Negative is supplied with an adapter from its own flange to that of the positive Lens.

Focus of Negative Element	2½in	3in.	4in.	5in.	6in.	7in.	8in.	10in.	12in.
Diameter	1 in	1¼in.	1½in.	1¾in	2in.	2¼in.	2⅜in.	2⅝in.	3in.
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Price, with Rack and Pinion Movement in Brass ..	3 15	3 15	4 10	5 5	6 0	7 0	8 10	11 0	14 0
Do., do., in Aluminium ..	4 10	4 10	5 5	6 10	7 5	8 10	10 0	12 10	15 10
Suitable for R.R. (*f*/8) Lenses	..	5×4	6½×4¾	8×5	8½×6½	10×8	12×10	*	*

* See Remarks, page 27.

NOTES ON THE FOREGOING.

I. HIGH-POWER. These Lenses are most suitable where great magnification is required. They will be found to give the most remarkable results, but for general utility are perhaps not so well adapted to the *average* worker as the Moderate-power Lenses. They give equivalent foci of about five times the back focus, or in other words an amplification of 5 diameters as compared with the size of image given by the positive Lens alone with the same amount of back extension, *the amplification, as in every Telephotographic Lens, increasing with longer extensions of camera.*

5 per cent. discount for Cash with Order

II. MODERATE-POWER. Give equivalent foci = about twice the actual camera extension employed, or three times the distance between negative and focussing screen. They are sufficiently rapid for all ordinary instantaneous work, and have the advantage of including a greater angle than system I., viz.:—about 17—21°.

I. & II. COMBINED. The combinations of High and Moderate-power form, perhaps, the most valuable instruments for Telephotography, enabling the operator to obtain either very high amplification for mountain scenery and similar subjects, or to work instantaneously with the weaker negative element.

III. MODERATE-POWER. These (R. R.) combinations give similar results to system II., but the angle included is a rather smaller one, about 12—15°, and they are not so rapid. The Portrait Lens combinations are—given an equal aperture of the front Lens—also more compact and portable, and cover a given size of plate with a smaller back focus. The only drawback of system II. is that it shows a slight marginal distortion when used over the full limits of field that it will cover. The question of portability is more particularly noticeable in the larger sized negative elements, the 10in. and 12in. attachments especially not being recommended where system II. can be employed, unless bulk and compactness are quite a matter of indifference.

TELEPHOTOGRAPHIC ATTACHMENTS TO OTHER THAN "DALLMEYER" LENSES.

The great advantage of System III. is that the negative attachments *can be adapted to any existing Lenses by first-class makers* (Rapid and Universal Symmetricals, Double Anastigmats, &c.), providing the rapidity of the positive Lens be not slower than *f*8. The attachments can be easily removed, and *in common with all our negative attachments*, will not in any way interfere with the ordinary working of the positive Lenses when used alone. It is only necessary that one size larger flange be employed on the Camera front.

By their aid a short-focus Lens can be made to any focal length desired, limited only by the length of the Camera, and as most modern Cameras are capable of considerable extension, large magnifications and a considerable range of equivalent foci may be obtained.

PRICES.—No extra charge is made on the prices quoted on page 26 (under System III.) for adapting these negative elements to various Lenses, except where special circumstances necessitate an unusually large amount. In such an instance a small additional charge is made to cover extra cost.

FITTING.—It may be taken for granted that the negative element for any positive element of a given focus will require to be about half, or rather more than half the focus of the latter. For instance, a Rapid Rectilinear Lens of 10in. focus may be converted into a Telephoto Lens by employing a 5in. negative element. Advice as to the best method of conversion will be willingly given on application.

In Lenses having an initial intensity of *f*5·6 or *f*6, a rather shorter negative may be used.

on all Lenses and Apparatus.

DALLMEYER'S PATENT TELEPHOTOGRAHIC LENSES.

WORKING DATA. (1)

I. HIGH-POWER (Portrait Lens Combination).

(11) Plate covered at full aperture.	No. 1. (2) (8) Back focus.	No. 1. (2) Corresponding focus.	No. 1. (9) Intensity.	No. 1. (10) Angle of View.	No. 2. (3) (8) Back focus.	No. 2. (3) Corresponding focus.	No. 2. (9) Intensity.	No. 2. (10) Angle of View.	No. 3. (4) (8) Back focus.	No. 3. (4) Corresponding focus.	No. 3. (9) Intensity.	No. 3. (10) Angle of View.
	In.	In.			In.	In.			In.	In.		
4¼ × 3¼	6½	26	f/17	Practically constant; at full aperture = 13°	6	26	f/13	Practically constant at full aperture = 13°	6	29	f/11	Practically constant; at full aperture = 12°
5 × 4	7½	29	f/19		7	29	f/15		7	32	f/12	
6½ × 4¾	10½	36	f/24		9	36	f/18		9½	41	f/15	
8½ × 6½	13	45	f/30		11½	44	f/22		12	50	f/19	
10 × 8	15½	54	f/36		14	53	f/27		14½	58	f/22	
12 × 10	18½	63	f/42		17	63	f/32		17½	69	f/26	
15 × 12	22	73	f/49		20	73	f/37		21	81	f/30	
18 × 16					24	86	f/43		26	99	f/37	

II. MODERATE-POWER (Portrait Lens Combination).

(11) Plate covered at full aperture.	No. 1. (5) (12) Back focus.	No. 1. (5) Corresponding focus.	No. 1. 9) Intensity.	No. 1. (10) Angle of View.	No. 2. (6) (12) Back focus.	No. 2. (6) Corresponding focus.	No. 2. (9) Intensity.	No. 2. (10) Angle of View.	No. 3. (7) (12) Back focus.	No. 3. (7) Corresponding focus.	No. 3. (9) Intensity.	No. 3. (10) Angle of View.
	In.	In.			In.	In.			In.	In.		
4¼ × 3¼	5	15	f/10	At full aperture = 18° to 20°	5⅛	17½	f/ 9	At full aperture = 16° to 19°	5⅜	22	f/8	At full aperture = 13° to 16°
5 × 4	6	17	f/11		6⅛	19½	f/10		6½	24	f/9	
6½ × 4¾	7½	20	f/13		8¼	23	f/12		8½	28	f/10	
8½ × 6½	10	25	f/17		10⅝	29	f/15		11¼	34	f/12	
10 × 8	12	29	f/19		13	33	f/17		14	40	f/15	
12 × 10	14½	34	f/23		15½	38	f/19		17	47	f/17	
15 × 12	18	41	f/27		18⅝	44	f/22		20	54	f/20	
18 × 16	22½	50	f/33		24	55	f/28		25½	66	f/24	

III. MODERATE-POWER (R.R. Lens Combination). (13)

(11) Plate covered at full aperture.	(14) Back focus.	(10) Angle of View.	5 × 4 R.R. and 3in. Negative. Corresponding focus.	5 × 4 R.R. and 3in. Negative. (9) Intensity.	6½ × 4¾ R.R. and 4in. Negative. Corresponding focus.	6½ × 4¾ R.R. and 4in. Negative. (9) Intensity.	8 × 5 R.R. and 5in. Negative. Corresponding focus.	8 × 5 R.R. and 5in. Negative. (9) Intensity.	8½ × 6½ R.R. and 6in. Negative. Corresponding focus.	8½ × 6½ R.R. and 6in. Negative. (9) Intensity.	10 × 8 R.R. and 7in. Negative. Corresponding focus.	10 × 8 R.R. and 7in. Negative. (9) Intensity.
	In.		In.		In.		In.		In.		In.	
4¼ × 3¼	6½	At full aperture = 13° to 15°	19	f/25	21	f/21						
5 × 4	7½		21	f/28	23	f/23	25	f/20	27	f/18		
6½ × 4¾	9½		25	f/33	27	f/27	29	f/23	31	f/21	33	f/19
8½ × 6½	13		32	f/43	34	f/34	36	f/29	38	f/25	40	f/23
10 × 8	15½		37	f/49	39	f/39	41	f/33	43	f/29	45	f/26
12 × 10	19½				47	f/47	49	f/39	51	f/34	53	f/30
15 × 12	23½						57	f/46	59	f/39	61	f/35
18 × 16	29								70	f/47	72	f/41

(1) These data are given for plates up to 18 × 16in. There is however no limit to the Camera extension that may be employed, as a focus may be obtained at any extension. Longer extensions of Camera give greater covering power, with an *increase* of corresponding focus and a *decrease* of intensity.

(2) Patent Stereo and No. 1 Negative.

(3) 1 B Patent and No. 2 Negative.

(4) 2 B Patent and No. 3 Negative.

(5) Patent Stereo and 2½in. Negative (Telephoto Detective Lens).

(6) 1 B Patent and 3in. Negative.

(7) 2 B Patent and 4in. Negative.

(8) To obtain the distances from the *flange* to the focussing screen, add 3¼, 4, and 6 inches for Nos. 1, 2, and 3 respectively.

(9) The actual intensity at full aperture, as expressing the ratio between aperture of front lens and (corresponding) focus is here given. As a matter of fact, however, it will be usually found that much less exposure than would be at first deemed necessary will suffice. *See* par. 7 "Practical Hints."

(10) The angle of view included *diminishes* as smaller diaphragms are employed.

(11) If a smaller stop than full aperture is used, a somewhat greater extension is necessary, the circle of illumination decreasing with the effective aperture, so that it is best to set the focussing screen at a rather longer extension than is necessary for covering the plate at full aperture.

(12) To obtain the distance from the *flange* to the focussing screen, add 2½, 3, and 4 inches for Nos. 1, 2, and 3 respectively.

(13) In this table the positive lens is in each case taken as working at f/8, and the intensities are given for this lens working at full aperture. By applying the rules on page 29 the working data for any other combinations may be readily determined.

(14) The projection of the Negative Lens into the inside of the Camera varies with different Positive Lenses employed. As a general guide, two inches less than the focus of the Negative Lens may be taken as being approximately correct.

CHOICE OF LENSES FOR VARIOUS SIZES OF CAMERAS.

For the guidance of purchasers we append a table of working data for the three Telephotographic Systems described, the magnification obtainable being simply a question of corresponding focus, a lense of say 30 inches focus giving an image showing an increase of 5 diameters in size over the image given by a lens of only 6 inches focus.

HINTS ON THE PRACTICAL WORKING OF TELEPHOTOGRAPHIC LENSES. (See also "Working Data.")

1. Rigidity of apparatus is a sine qua non in Telephotography. This cannot be too often insisted on, as the least tremor in the Camera or the *Tripod Stand* will be found detrimental to perfect definition, and the greater the magnification, the more will this become evident.*

2. Bear in mind the necessity of extremely accurate focussing, preferably with a focussing glass. *The Rack and Pinion on the Lens mount must be utilized for this purpose*, but the final adjustment of the focus may be advantageously performed by means of the Camera pinion. Always focus with the actual stop used.

3. In Systems I. and II. the notched back cell of the Portrait Lens is adjustable, and permits of perfect correction for outstanding Spherical Aberration (*i.e.*, want of sharpness), for all planes. *This back cell should be kept unscrewed for all Telephotographic work.* When using the High-power Negative unscrew half a turn; with *weaker* Negatives 1 turn to 1½ turns. In Portraiture the Lens may be used intact.

4. See that your dark slides are in perfect register.

5. The Telephotographic Lens has proved itself of great value, even under adverse atmospheric conditions, but naturally if there is time to choose these, the clearer the air the better. For distant mountain scenery an orange screen may be with advantage employed.

6. The focussing screen itself will readily show whether a given size of plate be covered or not. (See note 11 "Working Data.")

7. The increase of exposure as compared with positive Lens alone may be found by applying the rules for determining intensity. It is remarkable, however, what little increase will be really found necessary in proportion to the actual intensity ratio. The view ordinarily taken will be that of a distant object, where *under* exposure will be the rule to secure the necessary contrast. With a little experience the operator will easily be able to determine for himself the exact amount of exposure necessary.

8. Develop slowly, and use such developers as tend to give great density and clear shadows. Hydroquinone is most useful; but if pyro-ammonia be employed, it is advisable to take an excess of pyro, adding the ammonia *gradually*. As the best results are obtained by slow development, the plate should be carefully protected from light during the process.

* In very long extensions of large-sized Cameras, it is frequently advisable to use a small secondary stand for the support of the front of the apparatus.

CONCISE RULES FOR DETERMINING THE CORRESPONDING FOCI AND INTENSITY RATIOS (f/x) OF TELEPHOTOGRAPHIC LENS SYSTEMS.

I. By means of the ratio between the foci of the positive and negative elements.

This ratio is a known quantity, 3 to 1 or 4 to 1, or whatever it may be. If the distance between diaphragm slot and screen (when the Lens is focussed on a given object) be measured, and the distance thus found be increased in a like ratio, the result will be the equivalent focus of the system. The intensity is simply the equivalent focus divided by the clear aperture of the stop used.

II. By means of the linear magnification of the image given by the positive Lens alone.

Magnification = Divide distance from negative or back lens to focussing screen by the focus of the negative lens, and add 1 to the result.

Corresponding Focus = Focus of positive lens multiplied by the magnification.

Intensity Ratio = Intensity of positive lens divided by the magnification

Rule I. is perhaps the readiest to apply, and, although not absolutely correct, gives as close an approximation as is necessary. Rule II. is mathematically correct.

HOOK'S UNIVERSAL JOINT HANDLE.

For very long extensions of Camera in Telephotographic work. Price from 25/-.

DALLMEYER'S VIEW METER.

Constructed on the principle of the reversed Gallilean Telescope. It is small and compact, and one view meter can be made to serve for any number of lenses working upon a given size of plate, or different sizes of plates. Particulars as to foci of lenses and dimensions of plate or plates to be stated when ordering.

		£ s. d
Price, in small morocco case	Brass	1 1 0
" " "	Aluminium	1 3 0

DALLMEYER'S FOCUSSING GLASSES.

		Brass £ s. d.	Aluminium £ s. d.
No. 1	Focussing Glass (in case)	0 10	0 13 6
" 2	" " extra high power (in case)	0 12 6	0 15 6

These focussing glasses are essential for ascertaining that the image produced by the lens is formed accurately on the ground glass of the focussing screen, and consequently on the sensitive surface of the plate or paper.