



BY APPOINTMENT

Catalogue of
**Optical Projection
Apparatus**

PART 1

Optical Lanterns, Etc.

NEWTON & Co.

CATALOGUE
OPTICAL PROJECTION
APPARATUS

PART I

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FOR

SCIENCE LANTERNS
AND EPIDIASCOPES

SEE PARTS II AND III OF CATALOGUE

PART II.—SCIENCE AND COLOUR PROCESS
LANTERNS, PROJECTION MICROSCOPES,
POLARISCOPES, ETC.

PART III.—EPISCOPES AND EPIDIASCOPES

Post Free on application.



British Made

Optical Projection Apparatus



Manufactured by

NEWTON & Co.

Partners :

R. S. WRIGHT, M.I.E.E

E. E. BURNSIDE, A.M.I.E.E.

Contractors to the Admiralty, the War Office, etc.

72, WIGMORE STREET, LONDON, W.1.

(Late of 3, Fleet Street, E.C.)

ESTABLISHED OVER 200 YEARS

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MANUFACTURED BY

NEWTON & Co.

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LONDON."

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WELBECK, 4131
(2 lines).

72, Wigmore Street, and 13, Marylebone Lane,
London, W.1.

(Late of 3, FLEET STREET, E.C.)

IN the following pages will be found particulars of Optical Lanterns for the projection of Lantern Slides, together with numerous accessories for use in conjunction with the various Projectors.

For Science Lanterns for demonstration work in the Laboratory and Class Rooms, together with various accessories for use with them, see Part II of Catalogue and for Epidiascopes and other Opaque Projectors, see Part III.

It will be noticed that several additions have been made to our range of instruments and that others have been considerably improved both in design and in construction, and that the use of black enamel finish, where such is suitable, is now general, as it has been found that this is usually preferred.

TERMS

The prices quoted in this list are nett for goods supplied *ex Works*, London.

ELECTRIC LAMPS.—At the prices quoted we guarantee safe delivery of Electric Metal Filament Projection Lamps, and will also exchange any Lamp that fails the first time it is used, but we cannot hold ourselves responsible for consequential damages arising therefrom. Such Lamps must be returned for exchange within seven days of receipt, and in cases where spare Lamps are ordered for future use, it is desirable to test them immediately they arrive. *This guarantee applies to 100-volt Lamps only.*

Most instruments can, if desired, be supplied with high-voltage Lamps, thus avoiding the use of a Resistance. This guarantee does not apply to such Lamps.

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

All instruments are supplied with triple flex and three-pin plug of standard size, to earth the instrument in accordance with the recommendations of the Institution of Electrical Engineers. Any other form of fitting can, however, be supplied if required, but it is always advisable that the metal frame of the instrument should be in some way connected to earth.

CASES, PACKING AND CARRIAGE are charged for extra, but full allowance is made for cases and packing returned carriage paid within 14 days. All goods are sent at consignee's risk only, but every possible care is taken in packing. Goods should always be signed for "Not examined," and in the event of any breakage the carriers should be notified immediately. *All claims must be made within three days.*

ALL EMPTY CASES, GAS CYLINDERS, ETC., to be addressed to our Works—NEWTON WORKS, 68, BALLARD'S LANE, FINCHLEY, N.3.

Since May 1st, 1937, we have been compelled to increase some of our prices by approximately 10 per cent. The prices quoted in this Catalogue include this advance, and are current at time of publication (September, 1938), but are subject to alteration without notice.

TECHNICAL DETAILS

When ordering a Lantern Outfit the following information should be given, which will enable us to supply suitable apparatus :

1. The distance of the lantern from the screen.
2. The size of picture required on the screen.
3. The size of slides if other than English standard ($3\frac{1}{4} \times 3\frac{1}{4}$).
4. Electric light (if installed), if direct or alternating, voltage, and current available. If no electric current, state lighting of building.

*Facsimile of the Signature of
J. NEWTON, the Head of Messrs.
NEWTON'S Firm in 1704, the
year before Sir ISAAC NEWTON
was Knighted.*

Oct. 26. 1704 

New Combined Works of
NEWTON & CO.
AND
NEWTON & WRIGHT LTD.
FINCHLEY, N.3.



THE OFFICE BUILDING



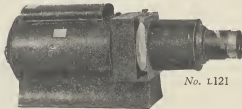
OPTICAL ASSEMBLY

Lanterns for use in Small Classrooms, Mission Halls, etc.



No. L120

THE
"WIGMORE"
JUNIOR



No. L121

These Lanterns have been produced mainly with a view to compactness and ease of manipulation. The non-essentials have been reduced to a minimum, but the essentials themselves, viz., the objective, condenser, and illuminant, are of thoroughly good quality, and may be relied upon to give excellent results upon the screen. The electric projection Lamps are permanently fixed in position and do not require centring before use, and the illumination of the picture on the screen is brilliant and even over the whole field. The range, of course, is limited, but the instruments are primarily intended for small displays, such as are required in classrooms or parish halls. A skilled operator is not required, as the instruments are exceedingly simple to manipulate.

The No. L120 is the most popular model and will give a well-illuminated picture up to 7 feet square, the Lantern being placed at 14 feet from the screen. The No. L121 is fitted with a more powerful lamp, and will give a picture of 9 feet square at a distance of 18 feet from the screen. Where the electric supply is over 100 volts, a Resistance is necessary, and these are supplied with a series of terminals, so that the outfit can be used on any current from 100 to 250 volts.

L120 THE "WIGMORE" JUNIOR LANTERN, *complete with 100-watt Lamp for 100-volt current, 4in. Condenser and Double Achromatic Objective* **£5 15 6**

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

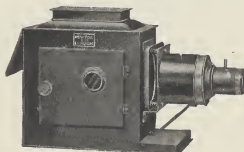
OPTICAL LANTERNS, ETC.

- L121 THE "WIGMORE" JUNIOR LANTERN, *complete with 250-watt Lamp for 100-volt current, 4in. Condenser and Double Achromatic Objective* **£6 18 6**

EXTRAS.

- 100-WATT RESISTANCE, *enabling Lantern No. L120 to be used on any current from 100 to 250 volts* **£1 10 0**
 250-WATT RESISTANCE, *enabling Lantern No. L121 to be used on any current from 100 to 250 volts* **£1 10 0**
 DOUBLE SLIDING CARRIER, for either model (included)

Type A2 Lantern



No. L10

This is the most inexpensive Lantern we can recommend for really serious work. Of new design, the instrument supersedes the "Popular" and A1 Models, which have been so well known for many years past, and it embodies the most important features of both the older models.

The Body is of steel, finished in black enamel, and is of sufficient size to accommodate a high-power electric Projection Lamp up to 250 watts; on the other hand, Limelight, Acetylene, or Oil Lamps can be fitted when electric current is not available.

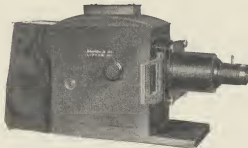
The Condenser is 4 inches in diameter, and the Objective, a double achromatic, is carried in a helical focusing mount.

- L10 THE A2 METAL-BODIED OPTICAL LANTERN, *as described above, fitted with 6in. or 8in. Focus Lens and Slide Carrier, without Illuminant* **£6 10 6**
 L11 *DITTO, ditto, but fitted with 10in. or 12in. Lens and Extension Tube* **£7 10 0**

For Illuminants, see pages 18 to 22.

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

Type A3 Lantern



No. L40

This Lantern is optically the same as the type mentioned on the previous page, but is provided with a brass plate front and a roomy body, which will accommodate a 500-watt Electric Lamp or other illuminant, without overheating.

The front and body are finished in black enamel.

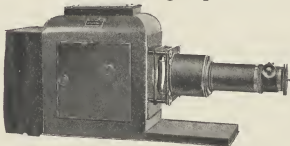
L40 A3 METAL-BODIED OPTICAL LANTERN, *as described, finished in black enamel, fitted with 6in. or 8in. Lens and Slide Carrier, but without illuminant* £9 10 0

L41 DITTO, *but fitted with 10in. or 12in. Lens and Extension Tube* £10 10 0

For Illuminants, see pages 18 to 22.

Type D

The "Intermediate" Long-range Lantern



No. L170

This Lantern is intended for use in large halls and is fitted with Lenses up to 20in. focus, suitable for long working distances.

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OPTICAL LANTERNS, ETC.

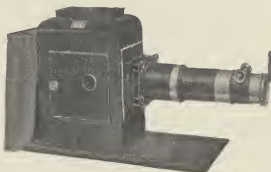
The Body is of Enamelled Steel, and is large and well ventilated, and of extremely handsome appearance.

- L70 D1 "INTERMEDIATE" LONG-RANGE LANTERN, *with enamelled steel Body, 4½in. Condenser, 2½in. diameter Petzval Lens, including Slide Carrier, but without Illuminant* £19 10 0
- L81 DITTO, *but fitted with "Wigmore" Anastigmat Projection Lens, 10in., 12in. or 14in. focus* £21 10 0
- L82 DITTO, *but with Lenses 16in. to 20in. focus* £23 10 0

For Illuminants, see pages 18 to 22.

For Arc Lamps, see Part II of Catalogue.

Type E Long Range Lantern



No. L90.

Similar in design and construction to the Type D instrument listed on page 7, this Lantern is intended for use in the very largest halls. It is provided with a 4½in. Condenser and a 3in. diameter "Wigmore" Projection Lens, which may be of any focus up to 24 inches. The Body of Enamelled Steel is of extra large size, and the centre of the Optics being 8 inches above the bottom a large Arc or 900-watt (30-volt 30-amp.) Projection Lamp may be used without overheating.

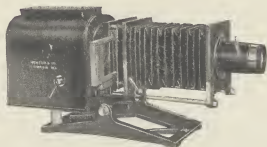
- L90 THE LONG RANGE LANTERN, *as above, complete with 3in. diameter "Wigmore" Projection Lens, of any focus up to 24 inches, including Slide Carrier, but without Illuminant* £33 0 0

For Illuminants, see pages 18 to 22.

For Arc Lamps, see Part II of Catalogue.

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The "Minerva" Optical Lantern



No. L170

This instrument is constructed largely of cast aluminium, and is exceedingly light and rigid. Portability and ease of manipulation are its outstanding features. The bellows front allows lenses of any focus from 6in. to 12in. to be used. Fitted with high candle power Projection Type Electric Lamp, in fixed position, the apparatus may be brought into use at very short notice.

L170 THE "MINERVA" OPTICAL LANTERN, *as described, with objective of any desired focus up to 12in. Complete with 500-watt Projection Type Electric Lamp for 100-volt circuit either direct or alternating. With Slide carrier* ... £16 10 0

L171 EXTRA FOR RESISTANCE, *for use on any current up to 250 volts* ... £2 0 0

L175 THE "MINERVA" LANTERN, *as No. L170, but fitted with a 250-watt Electric Lamp in place of a 500-watt Lamp* £16 5 0

L176 EXTRA FOR RESISTANCE, *for use on any current up to 250 volts* ... £1 10 0

L177 THE "MINERVA" LANTERN, *as No. L170, but fitted with 2½in. diameter "Wigmore" Projection Lens in helical mount, complete with 500-watt Projection Lamp (Resistance L1 extra)* ... £21 0 0

L178 DITTO, *as L177, but fitted with 250-watt Lamp (Resistance L176 extra)* ... £20 15 0

L180 FIBRE CARRYING CASE, *with leather handle, lock, etc., to hold either pattern, Lantern, Resistance, Slide Carrier, etc.* £1 13 0

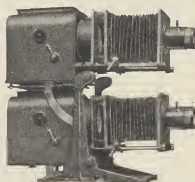
L181 TRANSFORMER, *for use in place of Resistance, 250-watt* £3 18 0

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L182 TRANSFORMER, *for use in place of Resistance*, 500-watt £4 10 0

Supplied only with electric illuminant. Accumulator Outfit L1013 (page 20) can be supplied in place of 500-watt Lamp and Resistance at an extra charge of £4 8 0, including Accumulators.

The Bi-Unial "Minerva" Lantern



No. L190

In order to meet renewed interest in Bi-Unial Lanterns for producing a dissolving effect upon the screen, giving a similar result to that obtained in times past with limelight, we have produced this outfit. As will be seen by the illustration, it is essentially two of our standard model instruments, No. L170, mounted on a single stand. Each Lantern can be tilted separately, so that the picture can be conveniently elevated, and also both pictures made to coincide accurately on the screen. The Lanterns are fitted with 500-watt Lamps, and the special sliding Resistance produces a perfect dissolving effect, one lamp being dimmed out while the other is brought on. The same Resistance is also adjustable for various voltages, and the whole forms a very compact outfit.

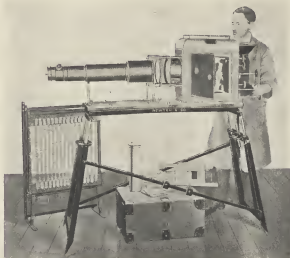
L190 BI-UNIAL "MINERVA" OPTICAL LANTERN, *as described, with 2in. Objectives of any desired focus up to 12 inches, two 500-watt Projection Type Electric Lamps* ... £38 10 0

L191 DISSOLVING RESISTANCE, *for use with above Lantern, on any current up to 250 volts* £11 0 0

TWO ECLIPSE CARRIERS, at 15/9 each. £1 11 6

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

The "Institution" Lantern, No. 1



No. L100

As the name indicates, this Lantern has been designed for the use of Institutions where the slides may not always be of standard type. The Lantern itself will accommodate slides $3\frac{1}{4}$ in. \times $3\frac{1}{4}$ in., $3\frac{1}{4}$ in. \times 4 in., $3\frac{1}{4}$ in. \times $4\frac{1}{4}$ in., 9 cm. \times 12 cm., in fact any size up to the largest of these dimensions.

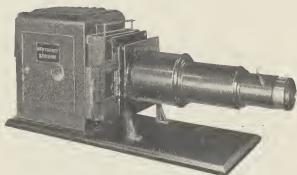
In addition to the large size Condenser required for the various size slides, it is also provided with an air-cooled stage. For the projection of colour process slides and in more trying conditions this can be amplified by means of a water tank. The large Arc Lamp provided enables dense slides to be projected with facility, and the range of Lenses allow the apparatus to be used in the largest halls, the brilliancy of the picture being secured by means of the Arc Lamp supplied, the slides being protected from damage by heat by the cooling arrangements.

L100 THE "INSTITUTION" LONG RANGE LANTERN, *complete with*
 $6\frac{1}{2}$ in. diameter Condenser, 3 in. diameter "Wigmore" Pro-
 jection Lens (any focus up to 30 inches), Interchangeable Slide
 Carrier for all size slides up to 9 cm. \times 12 cm., Metal Tilting
 Stand, the whole finished Black Enamel ... £75 0 0

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

- L105 HEAVY HAND-FEED ARC LAMP, *six movements, suitable for currents up to 100 amperes* Price quoted on request.
- L106 900-WATT (30-VOLT, 30-AMP.) PROJECTION LAMP OUTFIT
(Transformer extra) £5 7 0

The "Institution" Lantern, No. 2



No. L102

This instrument will accommodate a variety of sizes of slides as mentioned in the case of the No. 1 "Institution" Lantern, but it is very much more compact, the Body being somewhat smaller and mounted on a baseboard does not call for a special stand.

The Condensers are mounted in flat plates, which, for cleaning purposes, can be slid from the housing immediately in front of the lantern body.

Ample provision is made for air and water tank cooling, and the illuminant may either be an Arc Lamp or the Lamp which is most popular at the present day, i.e. the 900-watt (30-volt, 30-amp.) Projection Lamp, particulars of which will be found on page 19.

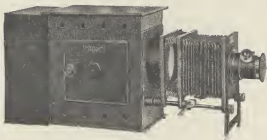
There are two models, the difference being the diameter and focus of the Objectives.

- L102 "INSTITUTION" LONG RANGE LANTERN, *complete with 6½in. diameter Condenser, 2¾in. diameter "Wigmore" Projection Lens of any focus up to 16 inches, Interchangeable Slide Carrier for any size slides up to 9cm. × 12cm.* ... £40 0 0
- L103 DITTO, ditto, *but fitted with 3in. diameter "Wigmore" Objective of any focus up to 30 inches* £50 0 0

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

Type F

The "Academy" Lantern



No. L110

This is perhaps the most "all-round" Lantern at a low price that has ever been placed on the market.

Originally introduced, as its name implies, for the use of schools and colleges, its great adaptability for either long or short range work has rendered it a most popular instrument in the lecture room or the Church. It is *not* suited for the very largest halls, for which our Nos. L70, L90, L100, L102 or L103 are required, but for distances varying from, say, 20 to 50 feet, it is quite adequate.

L110 "ACADEMY" LANTERN, *as above, with 4in. Condenser and Double Achromatic Objective, Bellows Extension, etc., with Slide Carrier, but without Illuminant* £11 15 6

For Illuminants, see pages 18 to 22.

The "Adaptable" Lantern



No. L150

As its name indicates, this instrument is adaptable for halls of various lengths, inasmuch as it can be fitted with lenses from 6in. to 16in. focus, and also, being fitted with a Bellows Front, it is easily adjusted to various lengths of throw from 6 or 8 feet, as would be the case in small classrooms, up to as much as 50 or 60 feet in a large church or hall.

The instrument is of somewhat novel design, as portability, lightness, adaptability and efficiency have been considered first, with the result that certain conventions have been abandoned.

As will be seen, a Bellows Front is provided, fine focusing being achieved by means of a scroll mount on the Objective, and the 500-watt Lamp is in its own housing and permanently fixed in the body, so that manipulation is an exceedingly simple matter.

The outfit is complete with Slide Carrier, Tilting Base, with 500-watt Lamp, and is capable of giving brilliant pictures up to 16ft. square on the screen.

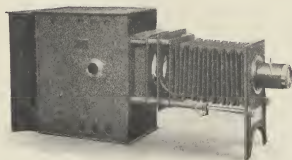
- L150 NEWTON'S "ADAPTABLE" LANTERN, *as described, complete with 4½in. Condenser, Tilting Base, Slide Carrier, 500-watt Projection Lamp, and 6in. or 8in. focus Objective* £7 17 6
- L151 DITTO, *ditto, with 10in. or 12in. Objective* ... £8 7 6

When ordering please state the voltage of electric supply.

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

Long Range Optical Lantern

THE "WIGMORE"



This instrument, which is a recent production, embodies several features which make it pre-eminently suitable for modern requirements in Lanterns of this type. Being provided with a bellows front, any Objective from 8 in. to 20 in. focus may be used, the same being mounted in a helical focusing mount. The 4½ in. diameter Condenser is mounted outside the body in a special cell and between the Condenser and the slide stage is a ventilating space, which prevents the slide being overheated. This space can also be provided with a water tank when very powerful illuminants and delicate slides are to be used. The body of the instrument is sufficiently large to accommodate either a powerful Arc Lamp or the new 900-watt 30-ampere 30-volt Projection Lamp that is proving so successful for long range work.

The whole instrument is finished in black enamel with chromium-plated fittings, the draw tubes carrying the Bellows Front being of rustless steel.

Fitted with 2½ in. diameter Double Achromatic Objective, any focus from 8 to 20 inches, and Slide Carrier **£14 10 0**

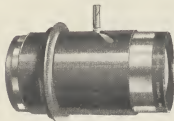
(Illuminant extra.)

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

THE "WIGMORE"

Anastigmat Projection Lenses

The use of high-power electric projection filament Lamps, which are proving such a boon to the lanternist owing to their simple manipulation as compared with arc lamps, are attended by certain limitations, which call for special consideration in the construction of modern projection lenses.



No. L170

The filament in these Lamps is, of course, concentrated as much as is possible, but the fact remains that the area of the illuminant is considerably larger than is the case with arc lamps, consequently, unless the objective be of excellent quality, a considerable amount of falling off of definition may be observed towards the edges of the picture on the screen.

In order to meet the situation, we have produced a series of high-class Objectives, which are known as the "Wigmore" Anastigmat Projection Lenses. These Lenses are London made and, in addition to giving excellent definition over the whole field, pass more light than is the case with the average objective usually supplied with Optical Lanterns designed for use with limelight or electric arc light.

The "Wigmore" Anastigmat Lenses are made at present in two sizes only, viz., 2 $\frac{3}{8}$ in. and 3in. diameter.

L170 THE "WIGMORE" ANASTIGMAT PROJECTION LENSES, *complete in Rack Mount, with standard 2 $\frac{3}{8}$ in. Thread for fitting to Lantern Front, focus 8in., 10in., 12in. or 14in.* £8 5 0

DITTO, 16in., 18in. or 20in. focus £10 10 0

L170A DITTO, in Helical Mounts, 8in. to 14in. focus, each £7 7 0

DITTO, 16in., 18in. or 20in. focus £9 10 0

L171 DITTO, in Tubes only, to fit standard Tube Rack Mount, 8in. to 14in. focus £5 10 0

DITTO, 16in., 18in. or 20in. focus £7 10 0

L172 THE "WIGMORE" LARGE DIAMETER (3in.) PROJECTION LENS, *focus up to 30in. In tubes only* £12 2 6

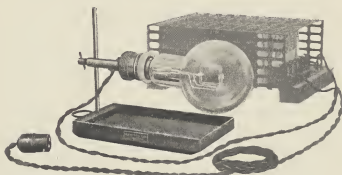
NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

Objectives and Condensers for Optical Lanterns

L150 2IN. DIAMETER DOUBLE ACHROMATIC OBJECTIVE, <i>complete in Rack Mount, any focus, from 6in. to 14in. (best quality)</i>	£3 10 0
L151 DITTO, <i>ditto (cheaper quality)</i>	£3 0 0
L151A DITTO, <i>in Helical Mount</i>	£2 12 3
L152 2 $\frac{3}{4}$ IN. DITTO, <i>in Rack Mount, focus from 6$\frac{1}{2}$in. up to 20in.*</i>	£5 10 0
L152A DITTO, <i>in Helical Mount*</i>	£5 5 0
L154 3IN. RACK MOUNT, <i>to take Tube Lenses No. L172</i>	£4 2 6
L155 2IN. DIAMETER EXTENSION TUBE, <i>for use with long focus Lenses</i>	£0 18 6
L156 2 $\frac{3}{4}$ IN. DITTO	£1 5 0
L157 3IN. DITTO	£1 12 0
L160 4IN. DIAMETER PLANO-CONVEX CONDENSERS, <i>complete, in Brass Mount (loose Lenses)</i>	£1 1 0
L161 4IN. HALF CONDENSER, <i>bezelled in Brass Mount</i>	£0 14 0
L162 4IN. PLANO-CONVEX CONDENSER LENS	£0 5 6
L163 4 $\frac{1}{2}$ IN. DIAMETER PLANO-CONVEX CONDENSERS, <i>complete in Brass Mounts (loose Lenses)</i>	£1 13 0
L164 4 $\frac{1}{2}$ IN. DIAMETER HALF CONDENSER, <i>bezelled in Brass Mount</i>	£1 2 0
L165 4 $\frac{1}{2}$ IN. DIAMETER PLANO-CONVEX CONDENSER LENS	£0 8 6

* See also Wigmore Lens, page 16.

Metal Filament Gas-filled Projection Lamps



No. L1000/1·2

We do not guarantee candle-power with any of these Lamps, as it is a somewhat variable factor and is a very unsatisfactory guide as to efficiency, but the following data may be useful:—

100-WATT LAMP, No. L1000, suitable for picture up to 8ft. square.

250-WATT LAMP, Nos. L1003 AND L1004, suitable for pictures up to 10ft. square.

500-WATT LAMP, No. L1006, suitable for pictures up to 12ft. square.

900-WATT LAMP, No. L1008, suitable for pictures up to 16ft. square.

The Lamps listed, and which we recommend, are for a 100-volt circuit, and if it is desired to use the same on a higher voltage electric supply, a resistance or transformer is supplied. We recommend this as a standard outfit, as the low voltage Lamps are very much more durable and efficient than those for high voltage, but, on the other hand, if a Lamp of the same voltage as the supply current, up to 250 volts, is desired, the same can be supplied, but a delay of some days will occur, as these Lamps are not held in stock, but will be obtained specially.

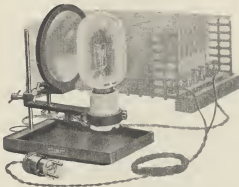
L1000/1	HORIZONTAL TYPE CONCENTRATED FILAMENT LAMP (100-watt), complete with Tray, and 10ft. Flexible Wire, for 100 volts circuit	£1 13 6
L1000/2	RESISTANCE for any voltage up to 240 volts, extra	£1 10 0
L1000/3	SPARE LAMPS, each	£0 12 6
L1003/1	DITTO, as No. L1000/1, but with 250-watt Lamp	£2 3 0
L1003/2	RESISTANCE for any voltage up to 250 volts, extra	£1 10 0
L1003/3	SPARE LAMPS, each	£1 2 0

Suitable for Lanterns L10, L40, L50 and L110.

For Transformers, see page 21.

NEWTON & CO., 72 WIGMORE STREET, LONDON, W.1

Tubular Pattern Concentrated Metal Filament Lamp



No. L1006/1/2

The illustration, No. L1106/2, shows this Lamp complete with Resistance.

It will be noticed that it is fitted with a special Reflector, which greatly increases its efficiency.

L1004/1 TUBULAR TYPE CONCENTRATED FILAMENT LAMP, *outfit complete, with 250-watt Lamp, for 100-volt circuit*

£3 2 6

L1004/2 RESISTANCE, *for any voltage up to 250 volts, extra* £1 10 0

L1004/3 SPARE LAMPS, each £1 2 0

L1006/1 DITTO, *as above, but with 500-watt Lamp, for 100-volt current* £3 7 0

L1006/2 RESISTANCE, *for any voltage up to 250 volts, extra* £2 0 0

L1006/3 SPARE LAMPS, each £1 6 6

L1008/1 DITTO, *as above, but with 900-watt Lamp, in special fitting and tray for 30-volt 30-amp. circuit* ... £5 7 0

L1008/2 TRANSFORMER, *for any current 200 to 260 volts* £12 12 0

L1008/3 SPARE LAMPS £1 18 6

L1004 Suitable for Lanterns L10 and L40.

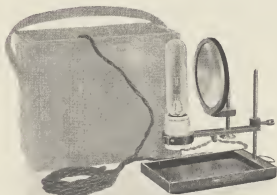
L1006 Suitable for Lanterns L40, L50, L70, L90, L110, s2001, s2011 and s2021.

L1008 Suitable for Lanterns L70, L90, L100, L102 and L103.

For Transformers, see page 21.

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The New Low Voltage Concentrated Filament Lamp



No. L1013/1/2

As a portable illuminant either No. L1012 or No. L1013 will be found of great advantage in country districts, etc., providing means of recharging the accumulators are available. No. L1012 will give a picture up to 6ft. square, and No. L1013 up to 10ft. square.

L1012/1 6-VOLT 4-AMPERE FILAMENT LAMP, *with Tray, special Reflector, Flexible Wire, without Accumulator* £2 3 6

L1012/2 6-VOLT ACCUMULATOR, *for use with same (weight 17½ lbs.)*
£2 10 6

L1013/1 DITTO, *with 12-volt 8-ampere Lamp, without Accumulator*
£2 11 0

L1013/2 12-VOLT ACCUMULATOR (*weight 35½ lbs.*) ... £5 2 6
Suitable for Lanterns L40 and L110.

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Transformers



With the advent of alternating current in nearly all districts the use of Transformers with electric Projection Lamps is becoming more and more prevalent, inasmuch as considerable saving of current is effected, and the use of a 100-volt lamp on high-voltage current is very greatly facilitated.

The instruments listed on this page are suitable for use with our standard Lamp Outfits and Apparatus fitted with such Lamps, in place of Resistances, which, of course, must still be used where the current happens to be direct.

The following instruments are suitable for use on any alternating current from 200 to 250 volts, they being provided with tappings which allow them to be adjusted as may be required.

OUTPUT, 100 VOLTS $2\frac{1}{2}$ AMPERES, <i>for use with 250-watt Lamps</i>	£3 18 0
OUTPUT 100 VOLTS 5 AMPERES, <i>for use with 500-watt Lamps</i>	£4 10 0
OUTPUT 100 VOLTS $7\frac{1}{2}$ AMPERES	£5 10 0
OUTPUT 30 VOLTS 30 AMPERES, <i>for 900-watt Lamps</i>	£12 12 0

Illuminants

Not Electric

A number of Lanterns can be fitted with many of the illuminants specified below.

Owing to the comparatively small sale of such fittings, however, it is advisable to confirm prices before ordering, and also it is most desirable to ascertain that the Lantern will accommodate the fittings it is contemplated to instal.

L301 4-WICK "NEWTONIAN" OIL LAMP, *with- Chimney and Reflector. Suitable for Lantern Type A2* ... £3 0 0

L302 COTTON WICKS, 2in. wide, for "Newtonian" 4-wick Lamp,
per dozen 4/6

L303 GLASSES, curved, for above Lamp ... each 8d.

L330 "NEWTONIAN" ACETYLENE GENERATOR ... £5 0 0

L335 HIGH-POWER ACETYLENE JET, *with four burners* £1 17 6

L336 FLEXIBLE METAL TUBING, *with Rubber Connections* £0 4 6

L357 "INJECTOR" LIMELIGHT JET.

L380 BEARD'S AUTOMATIC REGULATOR (*Oxygen or Hydrogen*).

L381 PRESSURE GAUGE.

L377 CYLINDER KEY, *Double Lever Pattern*.

L420 LANTERN TRAY, *to carry Jet*.

MABOR LIME CYLINDERS, *per box of six*.

1in., 2/6; 1½in., 3/6

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Lantern Stands



No. L705

L705 STAND, as illustrated, constructed with metal legs, struts, etc., and wood top, suitable for long range Lanterns ... £4 0 0

L706 DITTO, ditto, but of larger size, suitable for extra large Lanterns, Epidiascopes, etc. £4 15 6

Slide Carriers



No. L730

L730 DOUBLE SLIDING CARRIER, the simplest of all Carriers for single Lanterns. It is fitted with a very simple lifting arrangement, which raises the slides, enabling the operator to take them out more readily, for slides $3\frac{1}{4}$ in. \times $3\frac{1}{4}$ in. £0 5 0

L730A DITTO, for slides $3\frac{1}{4}$ in. \times 4 in. £0 5 6

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The Eclipse Carrier

This Carrier has the advantage over the double-sliding form in that all the slides are inserted and withdrawn from the same side, instead of every alternate one being worked from the far side of the lantern. It is sometimes called the Dissolving Carrier, as the appearance on the screen during the changing of the slides somewhat approximates to dissolving views.

L732 THE "ECLIPSE" CARRIER, *as described above* ... £0 15 9

L733 "UNIVERSAL ECLIPSE" CARRIER, *as above, but constructed for either ENGLISH ($3\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.) or CONTINENTAL (4in. \times $3\frac{1}{2}$ in.) slides* ... £0 19 0

The Newton "Universal" Push-Through Carrier



No. L735

The Newton "Universal Push-Through" Carrier is made in two sizes :—

No. 1. For a lantern stage of normal size, fitted with $4\frac{1}{2}$ in. diameter condenser, and will take slides up to 9×12 cms., but this size only in the horizontal position.

No. 2. For lanterns with a 6in. diameter condenser, taking slides up to 9×12 cms. either horizontally or vertically.

These Carriers enable lecturers to show slides of various sizes without interrupting the sequence of the pictures.

No. 1. METAL FRAMEWORK ONLY, *for fitting normal stage of lantern* £0 10 6

FRAMES, $3\frac{1}{2}$ in. \times $3\frac{1}{2}$ in., $3\frac{1}{2}$ in. \times 4in., and 9×12 cms.,
each £0 1 6

No. 2. METAL FRAMEWORK, *for lanterns fitted with 6in. condensers* £0 15 0

FRAMES, *for slides size as in No. 1, each* ... £0 2 6

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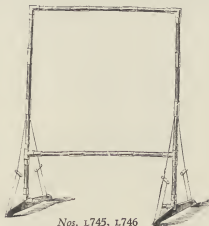
Lantern Sheets

A screen for lantern work may consist either of a linen sheet or a distempered canvas surface. The latter is by far the best, cannot be folded, but only rolled up. These canvas screens are therefore not very portable, and are chiefly used more or less as fixtures in lecture halls or churches. Prices and details of them are given on page 26. The linen sheets, on the other hand, can easily be packed up and put away in a bag; but the image on them is slightly less brilliant, as a percentage of the light passes through them and is lost. These sheets must be well stretched either on a screen stand or to the walls or fixtures in the room.

L741 OPAQUE SHEETS, for showing the pictures ON the sheet :—

6ft. square	...	£0 19 0	14ft. square	...	£3 17 6
8ft. "	...	£1 12 0	16ft. "	...	£4 13 6
9ft. "	...	£1 15 0	18ft. "	...	£5 7 6
10ft. "	...	£2 5 0	20ft. "	...	
12ft. "	...	£2 17 6			

Portable Sheet Stands



Constructed of Pine or Bamboo. These Stands are extremely light, and yet rigid; and are so arranged that the sheet can be stretched

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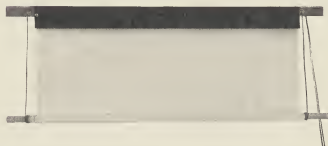
tightly on them. Being made in sections, they take up but little room when put away in their travelling cases.

L745	6ft.	square, complete in case	...	...	...	£4	10	0
	8ft.	"	"	"	...	£5	0	0
	9ft.	"	"	"	...	£5	4	6
	10ft.	"	"	"	...	£5	10	0
	12ft.	"	extra strong and heavy	...	...	£6	1	0

Prices for larger sizes sent on application.

L746 *If any of the above Stands are required to be raised from the ground, as in the illustration, the necessary lengthening pieces and unions can be supplied at an additional cost of* **£1 3 6**

Opaque Cloth Screens



L748 OPAQUE CLOTH SCREENS, PAINTED WHITE, and mounted on roller and batten, similar to a map, with pulleys and cords, so that they can be drawn up like a blind.

6ft. ...	£2	12	6	10ft. ...	£5	5	0	16ft. ...	£14	6	6
7ft. ...	£3	6	0	12ft. ...	£8	5	0	18ft. ...	£17	10	0
8ft. ...	£3	15	0	14ft. ...	£11	0	0	20ft. ...	£22	0	0
9ft. ...	£4	10	0								

L749 SCREENS *as above, but fitted in WOODEN CASES, so constructed with pulleys and cords that the Screen rolls up into the box for protection.*

6ft. ...	£4 8 0	10ft. ...	£7 15 0	16ft. ...	£18 14 0
7ft. ...	£5 4 6	12ft. ...	£10 14 6	18ft. ...	
8ft. ...	£5 19 0	14ft. ...	£14 6 6	20ft. ...	
9ft. ...	£6 17 6				

L752 WHITE OPAQUE SCREENS ON SPRING ROLLER, *in box with side supports. These Screens may be stood upon the floor or table and need no separate support at the top.*

3ft. ...	£3 16 6	5ft. ...	£5 17 0
4ft. ...	£4 18 0	6ft. ...	£6 0 0

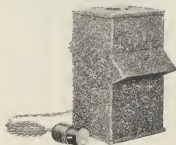
Transparent Roller Screens

L750 TRANSPARENT SCREENS *for back projection, mounted on roller and batten.*

6ft. ...	£3 6 0	9ft. ...	£7 19 6
8ft. ...	£6 6 6	10ft. ...	£11 0 0

These Screens are made to order only. Delivery takes about ten days.

Lecturers' Reading Lamps



No. L831

L831 ELECTRIC READING LAMP, *for use with standard 25-watt lamp. Gives good directional illumination for reading, well shielded from the screen. Complete with 12ft. flexible wire, plug, and red signal (lamp extra)...*

£0 12 6

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Boxes for Carrying Slides

Cheap Whitewood Lantern Slide Boxes.

With dovetailed corners and numbered grooves, brass hinges, and two catch fastenings, index label in lid, cleanly finished.

L771	50 grooves	...	...	...	...	...	£0 8 0
L773	100 "	...	...	...	...	...	£0 12 6

Cheap Varnished Ply-wood Boxes

With Webbing Straps.

L775	2 spaces	...	...	...	...	...	£0 3 6
L776	3 "	...	...	...	...	...	£0 4 0

Transit Boxes



No. L789

L784	BLACKENED WHITEWOOD SLIDE BOX, to hold about 45 slides, with 3 spaces, rubber top and bottom pads to guard against breakage, polished brass clamps at each end, and strong leather strap for carrying, each	...	...	...	...	£0 7 6
L785	DITTO, with 4 spaces to hold 60 slides, each	...	...	...	...	£0 8 6
L786	DITTO, with 6 spaces to hold 100 slides, each	...	...	...	...	£0 12 6
L787	DITTO, in polished mahogany, for 60 slides	...	...	...	...	£0 12 6
L788	DITTO, ditto, for 100 slides	...	...	...	...	£0 16 6
L789	DITTO, in polished mahogany, 3 spaces, felt lined, safety catch and strap	£0 16 6
L790	DITTO, 4 spaces	£0 18 6

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New Travelling Box

ATTACHE PATTERN.

This is made similar to an attache case, and in two sizes. It is thoroughly well made, and lined felt throughout; leather handle bolted through to iron plate inside, and three safety hooks.

L793	<i>Small size, to carry 120 slides</i>	...	...	...	£1 5 0
L794	<i>Large size, to carry 160 slides</i>	...	...	...	£1 12 6

Fibre Boxes

These are vulcanized fibre boxes, protected at the corners and lined with thick felt, into which the slides are either packed direct or enclosed in a 3-ply wood box, which is in turn enclosed in the outer fibre container.

Recent experiments have been made with regard to the transit of slides, and we find this method gives by far the best protection.

L810	FIBRE BOX <i>to hold 20 slides, without inner box</i>				...	£0 11 0
L811	„	„	„	40	„ „ „ „	£0 12 0
L812	„	„	„	60	„ „ „ „	£0 13 0
L813	„	„	„	40	„ <i>with inner box</i>	£0 16 0
L814	„	„	„	60	„ „ „ „	£0 17 6
L815	„	„	„	60	„ „ „ „	
					<i>in mahogany</i>	£1 15 0
L816	„	„	„	60	„ <i>with 4-space blackened</i>	
					<i>whitewood inner box</i>	£1 2 6

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Slide Cabinets

The most convenient way of storing Slides is in Cabinets containing as many drawers as are required. Each drawer holds about 60 slides.

They are supplied in whitewood and light or dark polished oak.

						In Whitewood.	In Dark Oak.
L797	CABINET, comprising 6 drawers	...				£2 5 0	£2 16 0
L798	" " 9 "	...				£2 13 6	£3 6 6
L799	" " 12 "	...				£3 10 0	£4 3 6

Hire Department

TARIFF FOR EXHIBITIONS, WITH OPERATOR.

For a single ELECTRIC LANTERN in a SMALL room (electric current laid on) with Operator, Sheet, etc., at any address within the London district £2 15 0

For a single ELECTRIC LANTERN in a LARGE (long range) Hall, with High Candle-power Electric Lamp, including carriage within London district. With Operator £3 10 0

For the large " INSTITUTION " LANTERN with Carriers for Slides up to 9cm. × 12cm., large Arc or High Candle-power Projector Lamp and Accessories, suitable for very large halls, and for the projection of ordinary and colour process slides. With Operator £4 4 0

For " WIGMORE " EPIDIASCOPE, with Operator, Sheet, etc. £3 5 0

For " NEWTON " EPIDIASCOPE, with Operator, Sheet, etc. £3 15 0

For 16 MM. KINEMATOGRAPH PROJECTOR, with Operator, Sheet, etc., for " silent " films £2 10 0

For DITTO, ditto, with complete Sound Equipment ... £3 3 0

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It is understood that a lecture will not exceed 2 hours in duration. If the operator is required beyond that period the extra time will be charged for.

The above prices are for our most experienced operators, but we have a certain number of junior assistants who are quite competent lanternists, whom we can, in some cases, arrange to send at reduced rates.

KINEMATOGRAPH EXHIBITIONS FOR STANDARD SIZE FILMS.

Kinematograph Exhibitions in London or Country Districts, including all necessary Apparatus, Operator, etc. (Prices on application.)

TARIFF FOR HIRE OF LANTERN APPARATUS, WITHOUT OPERATOR.

N.B.—These prices include delivery in London or to Railway Station. They do not include erection of the apparatus.

For SHORT RANGE LANTERN, with 2in. diameter Front Lens, fitted with Electric Projection Lamp ... per night £1 1 0

DITTO, ditto ... per week £1 15 0

For " INTERMEDIATE " LANTERN, fitted with Electric Projection Lamp, Resistance, Flexible Wire, complete ... per night £1 10 0

DITTO, ditto ... per week £2 10 0

For LONG RANGE LANTERN, fitted with Electric Projection Lamp, Resistance, etc. ... per night £2 7 6

DITTO, ditto ... per week £3 10 0

For " WIGMORE " EPIDIASCOPE, complete with length of Flexible Wire, Resistance, etc. ... £1 10 0

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OPTICAL LANTERNS, ETC.

For "NEWTON" EPIDIASCOPE, complete with length of Flexible Wire,
Resistance, etc. £2 0 0

For 16 MM. KINEMATOGRAPH PROJECTOR, for use with "silent"
films £1 15 0

NOTE.—Hire of Sheets for above apparatus are charged extra. (See below.)

TARIFF FOR HIRE OF ACCESSORIES.

For ELECTRIC FILAMENT PROJECTION LAMP, outfit complete with
length of Flexible Wire, and suitable Resistance

per night £0 17 6

DITTO, ditto per week £1 15 0

For any size OPAQUE SHEET AND STAND up to 12ft. square

per night £0 10 0

DITTO, ditto per week £0 15 0

SPOTLIGHT PROJECTORS FOR THEATRICALS, ETC.

For throwing powerful Coloured Lights on tableaux, etc., with Spotlight
and Flicker Effects, complete with High Candle-power Electric
Lamp per night £1 5 0

The above prices do not include carriage.

TARIFF OF FEES FOR SERVICES OF OPERATOR, INCLUDING FARES, ETC., WITHIN THE LONDON DISTRICT.

For services of EXPERT OPERATOR, for working client's own Lantern
per night £1 5 0

For services of JUNIOR OPERATOR, for working client's own Lantern
per night £0 15 0

NOTE.—The above prices do not hold for Saturday exhibitions
after one o'clock, in which case these prices will be slightly
increased.

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by the late JOSEPH GOOLD, and other well-known Scientists.

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