CINEMATOGRAPH SERIES OF THREE FOIL SHORTEST GIVES LARGE IMAGE WHEN CLOSE TO SCREEN. CRISP DEFINITION.

"OPTIMUS" MAGIC LANTERNS SUITED FOR DRAWING ROOM AND LECTURE HALL.

Limelight may be adapted without alteration at an extra cost of 16s., or in lieu of Lamp, 7s. 6d. extra.

Each Magic Lantern is efficient for Exhibitions. The Lens gives crisp definition, being a superior Achromatic Photographic Combination.

with rack and pinion. It is fitted to a telescopic lengthening tube, so gaining increased focal accommodation. The Condenser is composed of two plano-convex lens of 4 inches diameter. The refrigent lamp has three wicks, yielding a brilliantly illuminated picture. Each is complete in box.

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100 ENGLISH SUBJECTS, 30/- Each
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ARCHER'S IMPROVED OPTICAL LANTERNS.

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Proved superior to all others.

See Reports.

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The Improved "PHOTINUS" is the most powerful oil lantern in the world. Price £4 4s.

The Best "BLO-THRO" SAFETY JET in the Market. 500 Candle power. Price only 16s. Send for List, Post Free.

ARCHER'S NEW OPAQUE SCREENS, just supplied to the Manchester Photo Society, as they proved, THE BEST OF ALL. (See Testimonial.)

ARCHER & SONS, Lantern Specialists and Manufacturers, 43 to 49, Lord Street, Liverpool. Established 1848. Illustrated Lists free. Effect Slides painted for Wholesale London Houses. All kinds of Slides made to order.

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**THE MOTORGRAPH.**

For Projecting Animated Pictures and Exposing Films for producing same.

**Construction,** very strong without complications.

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Can be used with any Magic Lantern. Takes Films of Standard Perforation. Produces most brilliant picture, passing more light than other machines.

Absolutely Reliable! Cannot be Deranged in Working!! Very Compact.

(Outside size 6 x 4.5 x 5).

For full particulars of above and prices of Films, write for Catalogue No. 8.

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Further Improvements.—The finest Oil Lighted Lantern extant, gives brilliant 12 to 14 feet pictures; no smell, no smoke, no broken glasses; over 3,000 sold: 4-inch Condensors and large diameter Lenses, which give superb results. Not 4-inch and long focus lenses. With oil, these involve loss of light—nor chimney dampers, which are evils to be eschewed.

NOTE—The £6 6s. is reduced to £4 4s.

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**HUGHES' MOTO-PHOTOSCOPE.**

No shutter. No flickering. For showing the Living Pictures. Magnificent results. Pictures obtained with this machine from 6 to 20 feet. No shutter, therefore no flickering, which eclipses all others in the world. No eyesache and headache. Will show pretty pictures alternately, and has great facilities for changing the films, and the winding of same done in ten seconds. Is the most simple and perfect piece of mechanism extant. Magnificent engineers' high-class work without this perfection cannot be obtained. Professor Malden says: — "A great success. The machine works beautifully, and brought down un-roarious applause. The people, with one accord, say it is the best they have ever seen."

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**HUGHES' EXHIBITORS' MACHINE.**

Price £7 9s. Equalling many machines costing double the money. Particulars Free.

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**HUGHES' MOTO BIJOU LIVING PICTURE CAMERA.**

The most simple and perfect extant. Weighs only 6 lbs. Measures only 7½ by 4½ by 2. Can be used as a Camera, a Projector, and a Hand Camera. Price £15.

50 Beautifully Coloured Slides on Loan, 3s.

GREAT BARGAINS in APPARATUS and SLIDES.

W. WATSON & SONS, 313, High Holborn, London, W.C.; and 78, Swanston Street, Melbourne, Australia.

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W. C. HUGHES, Specialist in Optical Projection, Brewster House, 82, Mortimer Rd., Kingsland, N.
NOTICES.

The Optical Magic Lantern Journal and Photographic Enlarger is issued on the 1st of every month, price Two Pence, and may be obtained from all News-vendors, Railway News Stalls, Photographic Dealers, or from the Publishers, at the following rates, post free:—

12 months, 3/-. United States, 75 cents.

Exchange Column, General Wants, &c. (not Trade)—First 20 words, 6d.; and for every 3 additional words, 1d.

Small Advertisements must reach the office not later than the first post on the 24th of each month. All cheques and postal orders to be made payable to the Magic Lantern Journal Company, Limited.

Editorial communications must be addressed, J. Hay Taylor, Advertisements and business communications to Jos. T. Smith, Secretary, Magic Lantern Journal Company, Limited; 9, Canthiusian Street, London, E.C.

American Agents:—The International News Co., 83 and 85, Duane Street, New York City.

Philadelphia Photographic Salon.—The Pennsylvania Academy of Fine Arts makes a preliminary announcement that it proposes to hold under joint management with the Photographic Society of Philadelphia, during the Autumn of 1898, an exhibition of pictorial photography, to be known as the Philadelphia Photographic Salon. Only such pictures will be hung as may be approved by a jury of selection composed of well-known artists and artistic photographers, whose certificate of acceptance will be the only award. The exhibition will be held in the galleries of the academy from October 24th to November 12th, 1898. A circular, with full details, entry form, etc., will be sent on application to the offices, Broad Street, above Arch, Philadelphia, Pa., U.S.A.

Tunbridge Wells Photographic Association.—Sir David Salomons, Bart., has presented the above association, of which he is patron, with one of Edison's kinetoscopes for showing on the screen the animated pictures so much in favour just now; it is a very complete instrument, having many little improvements of
The Optical Magic Lantern Journal and Photographic Enlarger.

the donor's own adding, and works without the uncomfortable jumping so noticeable in most of those usually shown.

The Alexandra Palace.—After having remained closed for about nine years the Alexandra Palace, in the North of London, was opened on Good Friday. The lantern in one form or another is to be made a special feature, and an engagement has been made with Mr. Horace Banks (of the firm of Banks & Greaves) to give the following dioramic entertainments:—A trip from England to Japan—Japan and its people—The Queen's reign—Channel Islands—Picturesque New Zealand. At intervals during each lecture some well illustrated songs are given by Miss Carlotta Lynne, Gold Medalist, L.A.M. On most occasions on which we have heard this lady sing she has been accorded an encore.

Mellin's Food Cinematograph.—Mr. Chat- ham Pexton has arranged with the proprietors of Mellin's Food to give a series of advertisement entertainments with the cinematograph. This form of advertising is fast becoming popular. In the case of this firm samples of their wares are handed to each of the audience.

Submarine Photography.—The following particulars are sent by a correspondent of the Madras Standard. A Rio Janeiro inventor has devised a submarine photographic apparatus for use by divers. The operator has an incandescent electric lamp with a reflector fixed on his head-piece, and is provided with an ordinary camera enclosed in a rubber envelope having a glass front. Current for the lamp is supplied from the boat above and the pictures are taken by pressing buttons through the rubber covering. It is stated that objects have thus been photographed under water at a distance of 10 to 12 feet as easily as in full daylight.

Acetylene Apparatus Exhibition.—The Council of the Imperial Institute are making arrangements for an exhibition of apparatus in connection with acetylene gas, on or about June 1st. The Society has secured by then most occasions on which we have heard this lady sing she has been accorded an encore.

The Photographic Convention.—From July 4th to 9th the Convention will meet at Glasgow, the Galleries of the Royal Institute having been secured for the meeting. Lectures, lantern exhibitions, exhibitions of apparatus, and several excursions have been arranged. The annual dinner and smoking concert will take place at the "Windsor Hotel." Railway tickets from London, available for 11 days, may be obtained for £5. The hon. sec. is Mr. F. A. Bridge, Dalston Lane, London, N.E., who will be pleased to supply any information desired.

Acetylene Gas and Rubber Bags.—In the course of some experiments an india-rubber bag filled with acetylene was subjected to a slight pressure and in three days the gas had passed through the rubber, although to air the bag was impervious. Toy balloons behaved in the same manner.

Blairgowrie Photographic Association.—The members of this society have so increased in numbers as to necessitate the taking of larger premises than those at present occupied in Brown Street. Arrangements have been made to take over the Drill Hall in George Street, and it is to be thoroughly done up and decorated. In this hall there is ample accommodation for giving lantern lectures.

Precautions with Acetylene Generators.—It is a duty to direct attention to a piece of carelessness of daily occurrence which might cause accidents. When a generator gets out of order, the owner or person who attends to its working empties and cleans it superficially, then endeavours to find out the defect. In order to see better, even during daytime, he thinks it well to place a light inside. The generator must be well washed, brushed, all then after some hours' airing a light can be taken near it.

Tewkesbury Philharmonic Society.—The funds of this society recently benefited by an interesting lecture with lantern illustrations given by Mr. A. E. Tutton on "Some of the Glacier Passes of the Valassian Alps."
GENERAL ADVERTISEMENTS.

A PROFESSIONAL lanternist and cinematographist of great experience is open to engagements, with or without his own apparatus, in town or country, on very moderate terms. Reference, Editor of this Journal.


GREAT bargains in high-class triple, bi-unial, and oil-lighted lanterns, grand effects, lecture sets, etc.; illustrated lists post free 2d.—W. C. Hughes, Brewster House, 82, Mortimer-road, Kingsland, London, N.

COLLODION transparency making (from any size negative), free from grain; slides coloured best possible style; list of hand-painted dissolving effects, 1d.—Address, Wilkinson & Co., Artistes, Sunderland.

PHOTOGRAPHIC.—Lantern slide and stereoscopic printing studio for disposal; residence attached; good living for capable man; satisfactory reasons for leaving; instruction will be given if desired.—Letters to Tom Banks, House and Estate Agent, 4, Cherry-street, Birmingham.

BI-UNIAL lantern wanted, without jets and dissolver; valuable exchange offered.—Ivey House, Shepton Mallet.

ANTERN slides, life model stories, and services of song wanted; valuable exchange offered.—Ivey House, Shepton Mallet.

OPTIMUS lantern, four wicks, listed 52s., carrier and instruction book, 34 doz. photographic, 3 doz. coloured, 3 comic slipping slides, camera, dark-room lamp, chemicals and all accessories, £5.—Apply after 7 p.m., 179, Hollydale-road, Peckham.

WANTED, the address of makers of mechanical and other frames for effect slides,—Address, Mechanical Frames, c/o LANTERN JOURNAL, 9, Carthusian-street, London.

SPLENDID detachable bi-unial, with lamps, mixed and blow-through jets, four sets lens, etc., complete; also Wrench's cinemagraph with 12 films. These are first-class instruments, and have been successfully worked during the past season; cost about £120, sell for £60.—Particulars of A. G. Drewry, 21, Boxetgare, Doncaster.

WANTED, second-hand cylinder objectives, 3½ diameter, 10 in., 12 in., 14 in.; also first-class mechanical effects.—Optics, 13, York-street, Walworth, London.


WANTED, addresses and lists of makers of slides, lanterns (wood and metal), and photographic apparatus; good orders can be placed.—Address, Slides, c/o Journal.

MORLEY & COOPER,
70, UPPER STREET, LONDON, N.

LANTERNS, SLIDES AND ALL ACCESSORIES. LECTURER'S LANTERNS FROM 17/6
A large stock of New and Second-hand Cameras, Lenses, and Photographic Sundries on Sale or Exchange.

ESTABLISHED 1843.

The Optical Magic Lantern Journal and Photographic Enlarger.

OPTICAL LANTERNS & SLIDES
OF THE HIGHEST QUALITY ONLY.

NEWTON'S
PATENT IMPROVED
Phantasmagoria

LANTERN.

4-Wick "NEWTONIAN" Lamp.

4-inch Condenser.

As made for the School Board and County Council Lecturers, the Military Council of Education, &c.

NEWTON & CO.'S
NEW LANTERN SLIDES,
SEASON 1897-98.

Nansen's "Farthest North," with Reading.
Tissot's "Life of Our Lord Christ."
British Workman" Series, "Life of Christ."
Diamond Jubilee Procession.
Switzerland. Italy. Norway.
Veterinary Science. Fruit Cultivation.
Rothamstead Experiments.
The Naturalist in Australia. By W. Saville Kent.
The Spanish and Dutch Birds' Nests. By R. B. Lodge.
Steam Engines and Motor Cars.
Famous Artists and their Work.
Hoffman's "Life of Christ."
Children's Tales, &c., &c.

The above Slides are Published ONLY by
NEWTON & Co., 3, Fleet St., London, E.C.
THE "INJECTOR" MIXED JET.

Patents 10,554 and 24,761/93.

PRICE 30s.

This is the only Mixed Gas Jet which will work at full power with coal gas taken direct from the town supply, and oxygen from a cylinder. In order to effect this the oxygen, on its way to the mixing chamber, is made to pass through the small Injector I in the sketch at a pressure of about 12 lbs. per square inch. In passing through the Injector it sucks a supply of coal gas from the pipe H, which is connected with the house pipe, and forces it forward through the short pipe T into the mixing chamber M. Here the mixed gases meet the baffle plate B, which has the two-fold effect of silencing the passage of the gases, and ensuring their complete admixture. The mixed gases then pass through holes in the edge of the plate, and so to the burner. The requisite pressure of oxygen is obtained in the ordinary way by a fine tap on the cylinder, or an automatic regulator fitted with a high-pressure spring to deliver at about 15 lbs. pressure.

Three seasons' experience have fully established the superiority of this Jet over all others. It will yield THE FULL 1,800 TO 2,000 CANDLE-POWER (so-called) of the ordinary mixed jet when taking its supply of coal gas direct from the town's pipe, or even from a bag without any pressure at all. If a town's supply is not available, it will work just as well with coal gas from a cylinder. We cannot see why ordinary mixed jets should be purchased which cannot offer these alternatives. As for blow-through jets, we do not know why they should be used at all, when with the same economy and convenience of working, the Injector Jet will give two or three times the light.

The working of the Jet is simpler than that of an ordinary jet. When the H tap is once adjusted, it does not need to be touched again when using town's gas. The turning on or off of the oxygen supply regulates automatically the supply of coal gas. This is a great convenience in actual use.

Most existing jets can be fitted with an Injector to enable them to take their coal gas supply from the house pipe. The Jet will in certain cases be sent on approval on deposit of purchase price. Further particulars free on application to MANCHESTER OXYGEN (Brin's Patent) CO., LTD., Great Marlborough Street, Manchester.

The STEDMAN-BROWN AUTOMATIC OXYGEN GENERATOR

Has again been improved, and can be made to run any length of time. Gas made by this apparatus is pure, and costs only 1½d. per foot. The Generator and Gridiron Saturator makes a perfect outfit for producing limelight anywhere, especially in the Colonies and places where coal gas cannot be obtained.

Cinematograph Outfits

To suit any class of entertainment.

Lists free to any part of the world.

£6 0s. 0d. £3 0s. 0d.

F. BROWN,

Manufacturer of every description of Limelight Apparatus,

Manufacturer of every description of Limelight Apparatus,

Sole Maker of the Stedman-Brown Oxygen Generator, the Gridiron Saturator, the F.B. Jet, the Rosenberg Cinematograph, and dozens of other specialities for the Lantern trade.

13, GATE STREET, HOLBORN, LONDON, W.C.

Notice—Clement & Gilmer, of 8 & 10, Rue de Malte, Paris, are the Sole Continental Agents for THE STEDMAN-BROWN OXYGEN GENERATOR, and a. Molteni, 44, Rue du Chateau d'Eau, Paris, for the "GRIDIRON" SATURATOR.
Carelessness of Lantern Dealers.—In a letter received from Mr. Jas. Stewart, of Invercargill, New Zealand, he says:—*"I do trust you will stir up the makers of lantern apparatus to be more careful and particular as to the goods they supply, at any rate, to the Colonies. To give you an instance, I ordered from one of the oldest established houses in London a double set of lenses of 4, 6, 8, 10, and 12 inches focus, and—from your own statement, I had to return three of them as they were not paired, one being 4½, one 8½, and one 12½ inches focus. A lantern with one set of objectives was sent out with the condensers in their places, and being loose fitting (as they should be) had fallen out into the body of the lantern, and were both broken, while the burners (high-class) would not fit on the tray posts, and even the bore of the jets was two sizes of needles difference. All these errors in a £60 order, cash down! The same thing applies to saturators I have ordered; I cannot get anything definite from a single maker to whom I have applied. I have ordered saturators specially to suit so many inches of water pressure; these were sent with a note saying:—"As we have no means of measuring the inches of water pressure, we think and hope what we send will meet with your approval.' These saturators are still in my possession, but have never been used."

Cuban War and Explosion of "Maine."—Messrs. Riley Bros., of Bradford, have received a batch of negatives from their New York house relating to the late scenes in Cuba, the explosion of the "Maine," and also of American battleships. Slides have been made from these negatives and are published at the uniform price of 1s. each. The Cuban set comprises 40 slides, the "Maine" accident 20 slides, and the Battleship series 29 slides. We have seen a few of these slides, which are interesting and clear. The output will doubtless be large, especially as the subject will be a prominent one for some time to come.

We regret to have to record the death (from consumption) of Mr. Philipp Wolff, which took place at Barcelona. Mr. Wolff was well known in connection with his cinematograph films, and had business houses in Paris, Berlin, and London. This latter has since its commencement been under the entire direction of Mr. Hessberg, under whose management it will continue as before.

Intercepting Heat Rays for Cinematographic Projection.

THE usual method for intercepting heat rays when projecting cinematographic pictures has been the use of what is termed the alum trough, which originally consisted of a solution of alum in water until it was found that water alone was just as effectual, when the use of the alum was discarded, and water alone used in a narrow glass trough placed between the illuminant and the celluloid film.

Water, however, has the habit of boiling in a glass vessel at 214 degrees Fahr., and in a metal one at 212 degrees; the former must, of course, be used in connection with lantern work, but long before it reaches ebullition the trough becomes more or less filled with bubbles which destroy the clearness of the pictures projected. This necessitates attention in changing the supply of water occasionally. It has been found by Mr. Bellingham, a lecturer and amateur photographer of considerable fame (of Blackburn), and Mr. Holt, the electrical engineer of Blackburn Municipal Technical School, that more suitable solutions could be employed with advantage, so in the course of numerous experiments they decided that the most suitable was glycerine. This boils at 500 degrees Fahr., and further, does not cause inconvenience by the formation of bubbles.

Some further experiments resulted in placing a special form of trough containing glycerine between the illuminant and the condenser instead of the plan usually adopted for placing a trough, viz., between the condenser and slide, and in this position it was recently used during an exhibition lasting two hours with an arc light of about 2,000 candle-power, with a continuous current of over 15 amperes on a screen 20 feet square, the lantern being 95 feet distant. At the end careful notes were made, and it was found that the glycerine had only attained a temperature of 176 degrees Fahr.

Should the trough be used between the light and the condenser, it is, we understand, necessary that the glycerine should be anhydrous, but if between the condenser and slide this is not essential.

In the exhibition spoken of slides left for a somewhat prolonged period were only slightly warmed.
We consider that Mr. Bellingham is to be congratulated on his discovery, for by means of a bath as stated above another element of danger with regard to cinematographic projection is removed.

Cinematographing at Worthing.

On the 6th April the inhabitants of Worthing were suddenly startled by the report of a cannon, which meant, to those "not in the know," a ship in distress. Consequently crowds gathered quickly on the sea front, hastening westwards along the Marine Parade as far as the flagstaff opposite the coastguard station, where the lifeboat was ominously emerging from its shelter. Great excitement prevailed; four horses were connected, the crew donning their coats of cork and mounting with all speed their pet life-saving apparatus—one of the many monuments of England's beneficence.

Soon the command was given, "Let her go!" On this occasion, however, that command had a double meaning, and many in the crowd were greatly puzzled as to the meaning of all they saw. Close to the esplanade stood a horse with a heavy cart behind it, laden with what connoisseurs called electric batteries, which sent their mysterious powers through a red double cord up to a huge camera mounted on a rigid iron tripod, and inside of this instrument there was a reel holding a sensitised film about 200 feet long. This, too, was "let go," to run its entire length down behind a lens, recording many impressions per second of the interesting procession rushing by towards the scene of action.

This big camera was the "Mutograph," of the Mutoscope and Biograph Syndicate, Ltd., of London. The instrument is the invention of Mr. Herman Casler, and was brought here and manipulated by Mr. Wm. K. Laurie Dickson, Elec. Eng. Technician to the American Mutoscope Co. (with Edison, 1881—1895). As soon as the first performance was completed, the whole machinery was erected on the pier to take the launching and departure of the lifeboat. When this had been accomplished the mutograph was loaded for the third time to photograph also the landing of the Worthing gallant corky crew. For this event the spectators had to wait nearly two hours, during which time many of them dispersed. As the boat was nearing the shore and surmounting the last few breakers, Mr. Dickson shouted once more, "Let her go!" When the lifeboat struck the beach many rushed forward to assist in pulling her up, while some of the crew jumped hastily out of the boat into the foaming waves, and quick as lightning, yet most carefully, laid upon the sand the body of a man drowned (?) for the purpose of pleasing sightseers and in the interests of science. Medical aid was, however, at hand, and by means of proper restoratives and a most scientific manipulation of the breathing apparatus, the drowned mariner was soon able to return to his home and friends. And thus ended the noble work of life-saving and animated photography.

There was an ordinary camera in the outfit, of which Mr. A. R. Schutz, the author of "Celestial Symphony" and other well-known astronomical works, had charge, taking many snapshots of the various scenes presented.

The sun was shining all the time, there was a good breeze blowing and plenty of sea—all very favourable circumstances, so that the pictures taken (about 4,000) ought to be very effective when finished and projected upon the screen. The following day (the 7th inst.) the Worthing Swimming Club played some games of water-polo, etc., in the big baths at West Worthing, while the mutograph was again actively looking on and taking it all in.

Lumière's Acetone Pyro-Developer.—No. II.

(Continued from page 64).

INFLUENCE OF THE QUANTITY OF SULPHITE AND THE QUANTITY OF ACETONE.

By varying at the same time in the aqueous solution containing 1 part pyrogallic acid, the quantities of sulphite and acetone by preserving between these two reactives the proportion of 1 to 2, which seems the most favourable—we have remarked that over 5 parts of sulphite for 10 parts acetone—it is not advisable to increase the relative proportion of these substances, because the negative, although becoming weaker, also became more and more greyish and foggy. Other trials in which we chose the proportion of 1 and 1, and 2 and 1 between the sulphite and the acetone, have shown in proportion to...
The Optical Magic Lantern Journal and Photographic Enlarger.

IMPORTANT ANNOUNCEMENT.

By the enterprise of our New York house, we are enabled to offer lecturers in this country a fine series of photographic slides, depicting the War in Cuba, and the accident to the "Maine." With the exception of some half-dozen subjects—mostly portraits—all the slides are from negatives taken on the spot, and in the possession of our New York house, and afford an example of enterprise which is without precedent in connection with the Optical Lantern. The negatives of U.S. battleships are also very fine, and of great interest at this juncture. The slides are sold without any increase in price.

ONE SHILLING EACH (PLAIN),

And may be had from any dealer, or from the owners of the negatives:

RILEY BROS., 55-57, Godwin St., Bradford, Yorks.

And 16, BEEKMAN STREET, NEW YORK CITY.

LIST OF SLIDES.

CUBA AND THE CUBAN WAR,
INCLUDING THE DISASTER TO THE BATTLESHIP "MAINE."

1. Map of Cuba.
2. Cuban and Spanish flags.
6. Havana. Tomb of Columbus.
10. General Callisto Garcia.
13. Railway Tender conveying soldiers to the relief of Jaragua.
14. After the sacking of Jaragua.
15. San Cristobal. Shelter built in vacant lot.
17. San Cristobal. Spanish Volunteers defending the town.
18. San Cristobal. People living under a tree.
20. San Cristobal. Spot where the students were massacred.
22. Santa Clara. Streets which have not been paved for 25 years.
27. San Juan. After the burning.
28. San Juan. The Fort.
29. San Juan. After the raid.
30. San Juan. The ruins.
31. A sleeping soldier.
32. La Cruces. Soldiers at rest.
34. Soldier equipped.
35. Soldiers eating breakfast. Matanzas.
36. Spanish Guerilla force.
37. Train stopping at burning bridge.
38. Machinery destroyed by insurgents because owner would not pay his taxes.
39. Ruined church at Pelanos, now used as Heliographic Tower.
40. General Baran and Staff.

THE DISASTER TO THE "MAINE."

1. U.S. Battleship "Maine."
2. The day after the explosion.
3. Another view.
4. Another view.
5. Burying the dead, Havana, showing Capt. Siebee, General Lee, and others.
6. Diver Schlueter preparing to go down.
7. Divers at the rear of the ship.
8. Divers going down the ladder.
9. Wrecking tug and tender.
12. Capt. Siebee boarding the "Fern."
13. Officers on main deck.
15. 6-in. battered powder cases, showing rupture from pressure on ends.
16. Dead bodies floating in the bay (a trap shot).
17. Putting dead bodies in coffins.
18. Wounded "Maine" sailors on the steps of the Marine hospital, Key West.
19. President McKinley.

UNITED STATES BATTLESHIPS.

1. U.S.S. "Atlanta."
2. "Andrews."
3. "Bennington."
4. "Baltimore."
5. "Boston."
6. "Cushing."
7. "Concord."
8. "Congo."
10. "Charleston."
11. U.S.S. "Columbia."
12. "Dolphin."
13. "Erie."
14. "Indiana."
15. "Indiana. Deck view."
16. "Kearsarge."
17. "Marblehead."
18. "Miantonomah."
19. "Minneapolis."
21. U.S.S. "Newark."
22. "Petrol."
23. "Philadelphia."
24. "San Francisco."
26. "Texas."
27. "Vesuvius."
28. "Yorktown."
29. "Yorktown. Deck view."

BAMFORTH'S
Life Model Lantern Slides,
ILLUSTRATED SONGS, Etc.

The Largest Producer of Life Model Slides in the World.

Detailed Catalogue, 186 pages, post free 6d. Slides made from customer's negatives by a Special Wet Collodion process, giving good results even from the weakest film negatives. Send negative for sample slide and terms gratis.

JAMES BAMFORTH, STATION ROAD, HOLMFIRTH, YORKS.

C. W. LOCKE,
MAKER OF
High-class Optical Lanterns
AND ALL ACCESSORIES.

Specialties.—Locke's Patent High-power Mixed Gas Jets; Locke's Improved High-power Blow-through Jets; Screw-down Valves for Jets, Etc.

Office and Works—
244, Tottenham Court Road, London, W.
Please Note!

The Sandell Plates

Are now reduced to

Ordinary * Prices.

The Best and Cheapest Line the Dealers can Stock.

Remember all sizes can be stocked with impunity.

The Plates keep indefinitely.

Sandell I.

Lantern * Plates.

The Plates that all sooner or later must use.

The Revised Price Lists are now ready. Supplies will be forwarded on application.

The Sandell Works Co., Ltd., South Norwood, London, S.E.

Telegrams—“Stereogram, London.”

Managing Director—J. T. Sandell.
the density and purity results considerably inferior to those made with the proportion of 1 to 2.

NORMAL DEVELOPER, PYROGALIC ACID WITH SULPHITE OF SODIUM AND ACETONE.

In consequence of the previous trials, we have arrived at the conclusion that the following composition is the best for a normal developer:

Water ... ... ... ... 100 parts.
Sulphite of Sodium, anhydrous ... ... 5 "
Acetone Solution ... ... ... ... 10 "
Pyrogallic Acid ... ... ... ... 1 "

With such a developer very brilliant negatives are obtained, giving a rich gradation of tone in the shadows, and appearing at least as fully developed as those which it is possible to obtain with amidol. The difference which is most appreciable with the latter is in the colour of the reduced silver, which is a warm black instead of the blue black colour obtained with the first named developer.

It must be observed that the black sepia tone is very constant, even when using greatly different proportions of acetone, and in any case we have found that the gelatine has never coloured, as is often the case when using pyrogallic acid with the alkaline carbonates.

ELASTICITY OF THE DEVELOPER.

The carbonate of soda permits, as is well known, by its gradual addition to the pyro-developer of correction of over-exposure, and we have tried whether the acetone could produce the same result. To this end we plunged an over-exposed negative into the normal developer without acetone, then acetone was added little by little until the image appeared, and the negative was allowed to progress slowly with this small quantity of acetone. Under these conditions, and in spite of the over-exposure, a satisfactory negative was obtained.

Thus acetone added gradually permits the pyro-developer all the elasticity which can be obtained with alkalies, and consequently allows of the correction of over-exposure.

CONCENTRATED DEVELOPER.

In order to use the developer in a rational way, make a saturated solution of anhydrous sulphite of sodium (20 parts sulphite in 100 parts of water), dissolve therein 4 parts pyrogallic acid, then at the moment of development dilute 25 parts of this solution with 3 times its volume of water, and add say 10 parts acetone solution for a normally exposed negative, or, in the case of over-exposure the acetone should be added drop by drop.

KEEPING QUALITIES OF THE DEVELOPER.

The developer having the normal composition indicated above will keep without change in well closed bottles, and after a fortnight its reducing capacity has not sensibly diminished. On the other hand, it changes slowly when exposed to the air in the same degree as other pyro-developers.

COLOUR OF THE REduced SILVER GLASS POSITIVES.

By augmenting the quantity of acetone in the normal developer it will be found that the reduced silver is of a different colour with the amount of acetone in the mixture. With from 25 to 60 per cent. acetone a range of tones can be obtained varying from warm black to reddish sepia. With slow plates these variations of colour in the reduced silver are less accentuated, but nevertheless the tones produced are very interesting for obtaining glass positives (lantern slides).

ADVANTAGES OF THE ACETONE DEVELOPER.

By comparing the pyro-acetone as against pyro and alkali, the following are the advantages which the former shows over the latter:—Firstly, no colouration of emulsion, and very little variation in the colour of the reduced silver (when 10 per cent. of acetone is not exceeded), be the negative over or under-exposed. Secondly, suppression of the habitual inconveniences when using alkalies. Thirdly, interesting range of tones of the reduced silver when acetone is increased, a property which is very useful when obtaining glass positives (lantern plates).

PARAMIDOPHENOL DEVELOPER WITH SULPHITE OF SODIUM AND ACETONE.

Similar experiments made with paramidophenol as with pyro. Paramidophenol dissolves only in the proportion of 0-7 per cent. in the acetone. The solubility is the same in acetonic water, of which the amount of acetone is not inferior to 10 per cent. By preparing the paramidophenol-acetone developer, it is not possible to dissolve the base in acetone and then to add the water and sulphite of sodium, because the aqueous acetone solution oxidises very rapidly and discolours to red-brown, whilst when adding the acetone to the sulphite solution containing the paramidophenol in suspension a completely colourless solution is obtained, and oxidises very little when exposed to the air.

INFLUENCE OF THE QUANTITY OF SULPHITE.

A solution was prepared containing:

| Paramidophenol | ... | 0-7 parts. |
| Water ... ... ... ... | 100 |
| Acetone Solution ... ... ... | 10 |

The Optical Magic Lantern Journal and Photographic Enlarger. 73
A series of trials were made on identical negatives by using proportions of sulphite varying from 5 parts up to saturation, and by comparing the results obtained with those which a normal concentrated developer of paramidophenol and caustic lithia would give. Whatever the quantity of sulphite of sodium is, the images obtained are practically identical. In any case a reducing power has been obtained which was inferior to the type of developer with caustic lithia. Nevertheless, the negatives were always vigorous and free from fog. The inferiority of the reducing power over the normal developer is surely due to the feeble solubility of paramidophenol in acetonic water, which is very much inferior to the solubility of caustic lithia (0.7 per cent. instead of 2 per cent).

**INFLUENCE OF THE QUANTITY OF ACETONE.**

In a solution containing:

<table>
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<tr>
<td>Water</td>
<td>100 parts</td>
</tr>
<tr>
<td>Paramidophenol</td>
<td>0.7</td>
</tr>
<tr>
<td>Sulphite of Sodium</td>
<td>10</td>
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</table>

the quantity of acetone was methodically varied between 5 parts (minimum quantity) and 25 parts (maximum quantity). It was found that with over 15 parts acetonic water, there was no need to increase the quantity of acetone as the reducing power remained stationary. Between 5 and 15 parts acetone there were no great variations of density, and over-exposure could not be corrected by progressively adding acetone in very feeble proportions. In all cases, for the reason we have given above, the reducing power is inferior to the standard caustic lithia developer.

**NORMAL DEVELOPER, PARAMIDOPHENOL AND ACETONE.**

From the foregoing experiments the results furnished are inferior as far as the reducing energy of the caustic lithia developer is concerned, in consequence of the difficulty of dissolving paramidophenol in acetonic water, which is very much inferior to the solubility of caustic lithia (0.7 per cent. instead of 2 per cent).

**KEEPING POWER OF THE DEVELOPER.**

The solutions remain completely colourless, and may be kept without alteration in well-closed or even open bottles.

It will be seen that particularly for the pyro-developer acetone may be used with very great advantages, and as a successor to alkalies.

Fuerst Bros. have made arrangements with Messrs. Lumiere to supply the above developer for English and Colonial markets.

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**Film Development.**

**BY EDMUND A. ROBINS.**

**HAND cameras are so universally used for all work which is destined to be made into lantern slides or for enlargement, that a few words upon the management of films will be of use to those who use them. Films are now upon the market at very reasonable rates—very little above the price of glass plates, and the great saving in weight, added to the advantage of being unbreakable, quite outweighs the additional cost, and makes them very acceptable to tourists and others to whom weight is a great factor, and also to cyclists who combine cycling and photography. These remarks are more specially devoted to that variety of film known as rollable or flexible film, in which the sensitive surface is coated upon a band of celluloid. There are two varieties on the market; the older style requiring a dark room for placing in and removing from the camera, and the other more recent and popular variety known as the "cartridge" system, this being constructed in such a way as to admit of all operations, excepting of course development, being conducted in daylight; this, of course, does not limit the quantity of sensitive material the photographer can have at his command. The development of this flexible material sometimes presents considerable difficulty to those to whom it is not familiar, but if carried out in the manner to be described, no difficulty will be experienced.

The film in the cartridge system is wound with black paper on the back, on which is the number of the exposure midway between two marks, which mark the limit of the exposure in either direction; these should be cut off in convenient lengths, consisting of from two to three exposures according to the size of the picture, two exposures generally being found sufficient for all ordinary purposes. If this is now immersed in the developer it will be found to curl up in a most objectionable manner, which generally results in the destruction of the film by mechanical injury or unequal development; the usual way of getting over this is to soak the film in water for about four minutes before development, and then the film will be found to lie quite flat, or else the cut up film may be placed between cardboard under pressure for a few hours. The developer should be contained
in a deep dish, which should be an inch or more larger either way than the strip of film.

A fair quantity of developer must be used, say 15 or 20 ozs. per 12 quarter plates (cut up into strips of two each). The whole of the developer is poured into the dish, and the strips of film placed therein, pressing under the surface with the finger tips, which may be covered with finger-stalls; the dish must be well rocked and the film examined from time to time. If any of the exposures are under or over-exposed they should after rinsing be transferred to a dish of clean water, and treated afterwards. Any developer with which the operator is in the habit of developing will do, but the following I can, from personal experience, recommend:

No. 1—Pyro .......................... 1 oz.
Sulphate of Soda .................. 6 ozs.
Water ................................ 32 ozs.

No. 2—Carbonate of Soda ...... 3 ozs.
Do. Potash ......................... 1 oz.
Water ................................ 32 ozs.

No. 3—Potassium, Bromide ...... 1 oz.
Water ................................ 6 ozs.

For normal or unknown exposures, one part of each of No. 1 and No. 2 with two parts of water. If the films are any of them over-exposed, they should be put aside as above suggested, and afterwards put back in the developer, to which has been added a few drops of No. 3. In case of under-exposure add No. 2.

Another very good developer is as follows:

A. ................................. 70 grains.
Ortol ................................ 35 gr.
Metabisulphite of Potash ...... 10 grs.
Water ................................ 40 grs.

B. ................................. 5 ozs.
Carbonate of Soda ............... 7 ozs.
Sulphite do ........................ 30 grs.
Potassium, Bromide ............ 40 grs.
Water ................................ 60 grs.

For use, take one part of A and one part of B.

This developer can be used over and over again, and gives very fine clean negatives, which is a most important point when they are intended for reproduction as lantern slides or enlargements. After development, the films are rinsed in water, and placed in a saturated solution of common alum for a few minutes; again rinse well, and fix in a bath of hypo, 4 ozs. to 20 ozs. water. The films are then washed in running water for a few hours, and should then be soaked in a 2 per cent. solution of glycerine for a few minutes; this is for the purpose of keeping the gelatine film soft and pliable, otherwise it would curl up and dry horny, and be liable to crack. The superfusing water can best be removed from the film by laying face downwards upon a sheet of glass, and passing the rubber squeegee over the back a few times; it is then pinned to a board at the corners, and allowed to dry spontaneously. Films must on no account be placed in methylated spirit or alcohol in order to hasten the drying, otherwise the celluloid will partly dissolve and cockle up, and entirely ruin the film beyond recovery. Intensification and reduction are conducted as usual, and nothing need be said upon these points. The films will lie flat if kept between cardboard while not in use.

The Lanternist's Practical Cyclopedia.*—No. XIX.
By CHARLES E. RENDLE.

O. M. L. J.—The initial letters used in referring to the Optical Magic Lantern Journal, a journal which was commenced in 1880 by Mr. J. Hay Taylor.

Opaque Lantern.—See Achromoscope.

Optics.—Generally speaking, the science of vision and the phenomena associated with light. The optics of the lantern are treated in brief amongst this series of articles under such headings as Condensers, Lens, Object Glass, and so forth. A particularly good book on this subject is the "Optics of Photography" by the late J. Traill Taylor. It is published by Whittaker & Co., of London, at 3s. 6d.

Optical Illusion.—See Illusion.

Optical Theatre.—The hall or theatre specially prepared and arranged for the exhibition of optical illusions and all pertaining thereto.

Optical Pointer.—There is what is called an optical pointer to be had in the form of a miniature lantern, so counterpoised on a pedestal stand that the ray of light, which of course is intense, may be directed to the spot on the screen to which attention is being drawn. Many uses there are for this little instrument apart from lantern work, such as the illumination of frescoes, tapestry, sculpture, and other objects that are not get-at-able, and to which a lecturer wishes to call attention. For ordinary lecturing a useful form of pointer will be found in the old-fashioned fishing rod. For a few pence an article can be bought answering well, and being generally in three parts (one fitting into the other) can be used of any length suitable to the size of the screen. A knob of India-rubber or cork at top end is advised. When closed up this useful accessory takes but little space when travelling.

Oxy-Calciunm Jet or Lamp.—This spirit jet (for such it is) was in great demand a decade or two ago, and was one of the earliest forms of limelight jet used. A stream of oxygen is directed through a spirit flame on to the lime, so be it observed but one gas is required for this form of light. The burner, which is in the form of a lamp, consists of a cistern constructed on the principle of the fountain lamp, and is some distance from the wick holder for two good reasons—that of safety and convenience. This reservoir has an inner cylinder which is air-tight, save a circular aperture at lower end in which a valve is fitted. By turning this
lower end up—the valve opens, when the spirit can be poured in. Then it is reversed and the valve closes, preventing the spirit escaping. It should be mentioned that a piece of wire attached to valve hangs down a short distance, and when this cylinder is lowered into the outer one the wire touches the bottom, causing valve to open, and the entrance of the air displaces a little of the spirit, which runs down to the burner, standing at a level about half-way between delivery tube and flame. As the spirit is consumed, so again air enters the cistern, and thus feeds the burner. The wick is of the old loose sort; this readily aids the flow of spirit. The oxygen tube is connected at burner much in the same way as other jets. Instructions for making one of these jets were given by the writer, Vol. III., page 93, of the Optical Magic Lantern Journal.

OXYGEN.—A colourless, tasteless, inodorous gas, constituting one-fifth of the atmosphere in which it is mixed with nitrogen and other gases. It was discovered by Priestly in 1774, by his placing a given quantity of mercurial oxide in a bottle or retort, and by the aid of a common burning glass and the sun’s rays, produced sufficient heat to give the oxygen from the oxide. There are, however, many methods employed for making oxygen gas for experimental purposes; that most generally adopted being the potassium chlorate and black manganese dioxide process. At this process also is used by lanternists, it being the most economical and sure, the following may be taken as a guide:—Take of the potassium chlorate four parts and of black manganese one part, mix well together in a mortar and place in a retort, which previously has been examined and found free from old residues and perfectly dry. A moderate heat is required to allow the gas to flow with regularity; so if a fire is used, too great a heat should not be given after the first few minutes. A Bunsen burner is best for the purpose, and easiest of regulation. It should, however, be removed before the retort has been disconnected with the wash bottle or water trough, else water is apt to be sucked back and so cause an explosion. Assuming that a wash bottle is used which is half full of water, in the mouth of this are two bottom of bottle, so that all gas passing through delivery tube must go into the water; the other receiving tube does not protrude through mouth of bottle further than possible; the outer end is connected with the gas bag or other receiving vessels for storage. As the gas generates it rushes through the delivery tube, is purified in passing through the water, and having entered the receiving tube is at once ready for use. To make sufficient gas to fill a gas bag, 40 by 30 inches, 32 ounces of chlorate of potash and 8 ounces of black oxide of manganese would be required, and this would run a dissolving lantern with care about an hour and a half. Of course, in making the gas (as in making any gas) certain precautions must be observed; but when an accident does happen it is always due to carelessness. No one should attempt to make gases without some knowledge of chemistry, and even then make themselves well acquainted with what they are going to do. Items:—It is dangerous to have assistance in making a gas if the would-be-helper is ignorant of the process. In case a retort should tumble from the fire, before replacing it be sure that the neck and pipes are clear and clean; the charge might block the outlets and cause explosion. To know whether the ingredients are pure heat a small quantity in an iron spoon; if pure they will melt, and dry up leaving a grey deposit; but an impure mixture does not melt, but flashes off like gunpowder and with a slight explosion. This should not be used. Half fill wash bottle with water, put in a few crystals of washing soda; this checks chlorine gas being carried off with the oxygen, and chlorine is bad for the bag. Open the stop cock of bag full and remove full weight, and place it above the level of wash bottle. Oxygen is the great supporter of combustion. For example, a glowing spark on a splint of wood instantly bursts into flame upon being plunged into a body of oxygen. Phosphorus and other substances burn in it with great brilliancy. Steel and other metals that will not burn in air are burnt and reduced to oxides. The density of oxygen is 16.

OXY-HYDROGEN.—The temperature of the hydrogen flame burning in air is about 1610 degrees C. When the flame is fed with oxygen in place of air, the temperature is more than doubled, 3,148 degrees C., hence the advantage of the oxy-hydrogen blow-pipe.

OXY-HYDROGEN LANTERN.—A lantern in which the oxyhydrogen or mixed gases are used.

OXY-HYDROGEN MICROSCOPE.—A lantern arranged to project enlarged images of microscopic slides and objects.

PAINTING SLIDES.—See Colouring Lantern Slides.

PANORAMA.—A complete view as seen from one point. Standing in the centre of a rotunda or cylindrical wall, the interior surface of which is hung with a painted canvas representing landscapes and objects in every direction—that would be a panorama. Panorama, a passing show.

PANORAMIC CARRIER.—See Carriers for Lanterns.

PANORAMIC SLIDES.—Are those on which are painted a series of views or other subjects, and passed slowly through the lantern stages that they may appear on the screen as non-intermittent.

PAPER LANTERN SLIDES.—Paper specially treated with oil of crocoite, then a solution of calophony, and finally gelatine. Transparencies are made which can be transferred to glass by above process.

PASTE FOR BINDING.—See Mounting Paste.

PERFORATED LIMES.—By perforating limes, which is done by boring small holes through them in the same direction as the pin hole runs, gives them, according to the opinion of some lanternists, a longer life and are less liable to crack.

PETROLEUM, OR ROCK OIL.—A liquid bitumen evading from certain beds belonging apparently to the carboniferous formation. Paraffins, olefins, hydrocarbons of which the mixture is composed, are of the benzine series.

PHANTASMAGORIA LANTERN.—This choice sounding term can be boils down into magic lantern, simply conveying the idea as by magic.

PHOTOGRAPH.—An instrument for the reproduction of sound. Sounds are transmitted by means of "writing," or a series of indentations on thin sheets of metal wrap round a cylinder. An elastic membrane drawn across a trumpeted mouthpiece beside the cylinder or drum, conducts the vibrations of—say the voice, to the soft tin foil or wax round the cylinder by means of needle points which are attached to the membranes, and delicately adjusted so that the vibrations are transferred to the wax as the cylinder rotates. The cylinder can be turned back to its first position, and by again rotating it at the same rate of speed, the markings on the cylinder operate on the needle point, and so set up vibrations on the membrane in counterpart to those by which the markings were produced. These vibrations are then brought in contact with the air, which causes the orginal speech, song, and so forth, to
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After the preliminary washing the prints to be toned should all be placed in the bath at the same time and allowed to remain there for about eight minutes. The operations of fixing, washing, &c., differ in no way from the usual routine.

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- 12 " " a cold purple brown tone.
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- 20 " " a brown tone.
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- 48 " " a red tone.

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be reproduced with more or less accuracy. It is stated that Mr. Edison has surpassed himself in his last phonograph invention, and a contemporary, only a day before this article was written and who was one of the invited Press guests at a trial performance of the instrument at Edison’s house, says: “By means of it the family man who cannot afford to take his daughters to a Patti concert, can, by a first outlay of £12, have in his house an instrument upon which to place a cylinder, purchasable at a small cost, which will reproduce the voice of the cantatrice as often as the family circle cry ‘encore.’”

(To be continued.)

Studies on Different Carbides.

WHY does one carbide act differently to another in the same apparatus, and why, says Le Journal de l’Acetylene, does not a carbide give in its double decomposition with water similar results to those obtained with generators of a different type? These facts are strange; the extraordinary temperature of electric furnaces, the necessary fusion, and markedly similar composition of the materials, are three conditions which should always give similar products; however, physical differences visible at first sight are common; as regards intimate constitution it varies considerably. On several occasions, when we dealt with the question of electric furnaces, we maintained that in some of these ovens, owing to their arrangement, electrolytic effects were produced which more or less injured formation of carbide. The proof is to be found in the old reduction furnaces employed for aluminium, and which did not give brilliant results in the manufacture of carbides. In this system of furnace, and as a rule in all those where one of the electrodes is employed for aluminium, and which did not give brilliant results in the manufacture of carbides. In this system of furnace, and as a rule in all those where one of the electrodes is formed by the material to be treated, there is a more or less active electrolyte variable in duration; it is not then astonishing that carbides thus made are different to those obtained in furnaces in which the thermic power of the arc is alone utilised. The great temperature of 3000° fluidifies coke and lime, which thus combine; but at the same time the electrolytic power acts in a contrary direction, with less strength it is true, to cause decomposition.

On account of their different modes of formation, the carbides can firstly be divided into two very distinct classes:

I. Hard, compact, close-grained carbides.
II. Lighter, porous carbides.

Let us see what occurs when hard carbide is brought into contact with water in a fall generator; the attack is instantaneous, but production of acetylene slow, and there results a somewhat slight increase of temperature, the heat developed by hydratation of the lime always represents the same number of calories for a weight of carbide; but development is progressive. This compact carbide is suitable for fall apparatus and immersion, particularly those of the two types which have a gas-holder. In the generators where the carbide is watered, hard carbide, after the first attacks, is not decomposed regularly, the layer of lime with which it is coated protects it against the action of water for a greater or less period of time; evolution of gas is fitful, and the high temperature produced engenders polymeric substances, which are less likely to appear with porous carbide, about which we shall speak.

Porous carbide is very suitable in watering generators; when the water is projected on the carbide it can, thanks to the porosity, penetrate the carbide more intimately, not limiting the action merely to surface. Internal decomposition of the pieces involves rupture, and the evolution of acetylene is pretty regular, whereas with compact carbide the gas is polymerised, and emits an offensive odour. This odour was ascribed to impurities due to the bad quality of carbide employed, but it is an error; there is not the unpleasant odour of sulphuretted or phosphuretted hydrogen, but the peculiar emanations of crude benzines. We know that benzine is the first of the polymeric products formed, and, in a kind of way, one of the most malodorous. This fact has already been mentioned with regard to volumetric analysis of carbides; polymerisation decreases the volume of the gaseous substances, and according as this or that method of attack has been employed a same carbide can give different results in analysis. According to the nature of the carbide one must then employ watering or immersion to obtain an accurate analysis.

Therefore, before complaining of the manufactures of any works, one should ascertain if the carbide has been employed and brought into contact with the water in satisfactory conditions as regards its nature. In our opinion porous carbides are made in furnaces where the electrolytic phenomena, specified above, occur. The rapid evolution of acetylene they cause, not being otherwise valuable, its production will gradually decrease, most makers of acetylene generators preferring slow evolution of acetylene. In short, when one gives an order to a works or depot, one must specify the kind of carbide required, as some factories manufacture both kinds. With hard carbides over-production, often a source of inconvenience, is greatly decreased.
International Photographic Exhibition.

On the 25th ult., one of the most successful exhibitions inaugurated by the Royal Photographic Society was opened at the Crystal Palace, Sydenham, by H.R.H. the Prince of Wales. Over 6,000 pictures are ranged on screens and stands along the North and South Naves, according to the ground plan which we are enabled to give. The exhibits are for the most part sectioned. The historical collection is displayed in the Egyptian Court (111-114), and includes portraits of prominent men, deceased, to whose efforts much of the present state of photography is due, also a collection of early photographs and apparatus.

The Roman Court (107-110) is devoted to examples of scientific photography.

The pictorial section is admirably displayed at the sides of the North Nave, embracing screens 61-102 and 87-115 and contains some excellent examples of photographs of all kinds and subjects.

Screens 89-96 show process work in connection with book illustrations, posters and such like.

Ranged along the centre of the North and South Naves are a number of well set out stalls containing exhibits of apparatus and materials dealt in by the various firms occupying the space, including pictures taken on the particular firm's plates or paper, among them being:

1. Mawson & Swan.—Chemicals, plates, slides, etc.
2. Marton & Company.—Mounts, negatives, cameras, etc.
3. W. Watson & Sons.—Hand, stand, and other cameras; also general apparatus.
4. J. H. Dallmeyer, Limited.—Lenses, cameras, shutters, etc., including a number of photographs showing the excellent definition given by their famous stigmatic and other lenses.
5. Elliott & Son.—A collection of bromide and carbon enlargements.
6. A. & M. Zimmermann.—Photographic chemicals.
7. Shew & Company.—A variety of cameras made by this firm.
8. Salnon & Son.—Magnesium lighting apparatus.
9. Prestwich Manufacturing Company.—A number of animatographs for taking and showing animated photographs.
10. The Platinotype Company.—Demonstrations of the platinotype process.
11. Morgan & Kind.—Photographic enlargements on various materials by this firm.
The Optical Magic Lantern Journal and Photographic Enlarger.

12. Griffin & Sons, Limited. — Developing and printing out papers, burnishers, etc.

13. George Houghton & Son. — Shutters, developing cabinets, and a general supply of cameras.

14. Penrose & Company exhibit what is believed to be the largest camera made in connection with process work, taking a plate 6 by 5 feet.

15. The Aerograph Company. — This exhibit is a great attraction, as demonstrations are given in drawing and working up enlargements with the aerograph, an instrument which blows the colour on the paper in an exceedingly fine spray.

16. Waterlow & Sons, Limited. — Samples of collotype and other printing.


20. York & Son. — A fine collection of lantern slides made by reduction; also wet collodion slides toned with bichloride of platinum.

22. J. H. Steward. — Complete lantern outfits with all this firm's latest improvements; also the Davenport-Steward electric lamp.


25. C. P. Goertz. — Lenses.

26. Adams & Company. — Photographic apparatus of all kinds, including their Yale, Ideal, Vesta, and Twin lens hand cameras.


28. Rotary Photographic Company. — Samples of bromide prints produced in continuous lengths by machinery.

29. Wellington & Ward. — Samples of prints on their smooth and rough surfaced papers.


32. J. Lizar. — Hand cameras of various kinds, changing boxes, stereoscopes and lanterns.

34. McKellen & Company. — Hand cameras.

39. The London Photo Supply Company show the Kalo's pocket camera.


This exhibition, which should be visited by all interested in photography, is to remain open until the 14th inst. Each evening lantern views are to be projected on a 30 feet screen, also various cinematographic displays will be given in the theatre.

Amongst those whose slides will be exhibited in the theatre are Messrs. Lodge, Bushby, Evans, Bridge, Hodges, Carpenter, Gale, Beckett, King, Sandland, Brownrigg, Williams, Baker, Bird, etc.
National Photographic and Allied Trades Exhibition.

ABOUT the time this journal reaches our readers the Exhibition of the Photographic and Allied Trades, which was held at Portman Rooms, Baker Street, W., will be over, it being held from April 22nd to 30th.

The rooms were nicely arranged and decorated, and the stands of the dealers—mostly wholesale—contained heavy supplies of the various kinds of goods dealt in. It was as if each dealer had conveyed his shop to these commodious rooms so that the retailer could inspect the latest or best goods from which to make a selection when replenishing his stock. This certainly was very convenient for such a purpose, but by admitting the general public to trade exhibitions on payment, it is a question as to whether they do not get access to information which is not intended for them.

We heard of the following style of conversation:

Attendant: "Have you seen our new double distilled hand camera which is provided with, etc."

Visitor: "Oh, that is one of Mr. Blowhard's new 'do everything' cameras, he was showing it to me a short time ago; he, you know, is the largest dealer in our town of—Blank—and makes all his own apparatus."

Attendant: "Nothing of the sort; I assure you, Mr. Blowhard is only one of our customers and he of course like many other firms we supply merely puts his own name upon the camera and calls it what he likes, the same as many other customers do," and so on.

However, much apparatus of interest was to be seen, and among those who had goods on exhibition were the Mutoscope Syndicate, Limited, who had mutoscopes, each containing a number of bromide pictures taken at rapid intervals, ranging from a common centre like the leaves of a book; these when a handle is turned are caused to revolve past a projection which causes the pictures to be viewed in rapid succession, thus causing the well-known effect known as animated pictures. These pictures are very steady and clearly depicted.

Blackfriars Photographic Company showed a fine cabinet dark-room, which folded and closed up in the form of a wardrobe. This was made in hard wood and polished, making a handsome piece of furniture. Other dark rooms, suitable for placing say in a garden, were shown.

Many other firms who do a strictly wholesale trade were represented.

During each day of the exhibition the Imperial Band gave selections from 3 to 6 and 7 to 10 in the main hall; and in the entertainment room, at intervals, a half-hour lecturette was given by Mr. T. C. Hepworth, followed by an exhibition of animated photographs by Mr. Cecil M. Hepworth, and animated photograph demonstrations by Mr. R. W. Paul, Messrs. Baxter & Wray and others.

Great credit is due to Mr. Arthur C. Brookes (secretary) for the excellent manner in which everything was planned and managed.
The Optical Magic Lantern Journal and Photographic Enlarger.

PATENTS and TRADEMARKS.

W. P. THOMPSON & CO.,
Telegraphic Address: "DISCOVERY, LONDON."
322, HIGH HOLBORN, LONDON, W.C. Telephone No. 6823, HOLBORN
Also at 6, LORD ST., LIVERPOOL; 6, BANK ST., MANCHESTER; LOWER TEMPLE ST., BIRMINGHAM.

Patents secured, maintained, defended and worked in all countries. Oppositions conducted, searches made, opinions on infringements given, and expert evidence arranged.
Trademarks, Designs and Copyrights secured and defended in all countries granting protection.

Handbook of Patent Law. Tenth Edition. British Portion, 6d. All countries, 2s. 6d

THE PENDANT SATURATOR.

Revolution in Jets!!!

1,500 CANDLE-POWER.

No. 1.—For Jets consuming up to 4½ cubic feet per hour.
No. 2.—For High Power Jets, Cinematographs, etc.

Write for particulars and Testimonials.

J. S. WILLWAY & SONS,
DRAWBRIDGE, BRISTOL.

Magic Lanterns & Slides! Great Bargains!

New and Second-hand Lanterns and Slides
Book with instructions, post free, six stamps.
Largest stock of Slides in the world, can be had on hire or purchase, very low terms. Second-hand lists and catalogue now ready, post free.

WALTER TYLER,
48 & 50, Waterloo Road, London.

BOUND VOLUMES
For 1897
NOW READY, PRICE 3/-.
The Optical Magic Lantern Journal and Photographic Enlarger.

RILEY BROTHERS,
PRIZE MEDALLISTS, CHICAGO EXHIBITION.
55 and 57, GODWIN STREET, BRADFORD, ENGLAND,
and 16, BEEKMAN STREET, NEW YORK.
Having Branches also in Boston, Chicago, Kansas City, and Minneapolis, and at Dunedin, N.Z.
we are prepared to prove that we are

THE LARGEST LANTERN OUTFITTERS IN THE WORLD,
and being extensive Makers and Exporters can command the best terms, and are therefore able to

SUPPLY OUR CUSTOMERS WITH THE BEST GOODS
at prices (when value is considered) much below ordinary dealers.

Our "PRAESTANTIA" Lantern at £4 4s.
(fitted for Oil) is acknowledged by hundreds to be the BEST,
BRIGHTEST and CHEAPEST LANTERN in the TRADE.
Or if fitted for OIL and LIMELIGHT £4 15s.
Fitted with LAWSON SATURATOR £5 10s.
It is the Banner Lantern of the World.
We have sold more of this Lantern than can be proved of any other Lantern in
existence, and have thousands of testimonials to its worth from every part of the globe.

Don't go away with the idea that this is our only Lantern that has
produced a sensation in the market, Our

Prize Medal "Monarch" Bi-unial, at £21 10s.,
Has the largest Sale of any Bi-unial Lantern in the market, and
gives Universal Satisfaction. Fitted with the
NEW 1,000 CANDLEPOWER LAWSON SATURATOR, £24 10s.
Giving a light never yet got by any Bi-unial offered.

IT IS SIMPLE TO WORK, AND SAFE IN ANY HANDS.
If you want the best of everything in the lantern world consult us, we supply information gladly.

LAWSON Patent
SATURATORS
For Single and Bi-unial Lanterns. Have
many imitators, but no equals. They
were first in the field, and take the lead
still. Simple, safe, economical. Giving
the brightest form of Limelight attainable.
Over 2,000 now in work. Write for par-
ticulars of the New 1,000 Candle-power
Bi-unial Saturator. An immense success.

OUR NEW SETS for this Season include: "The Victorian Era," "Our Brave Firemen," "The City of
Mexico," 9 New Illustrated Songs, "Manners and Customs of the East," New sets of "Moses" and
" Old New York," "On the way to Klondike," and many others.

OUR HIRE DEPARTMENT (50 slides loaned for 3s.) is the largest and most complete in the world.
Best Sets published added yearly. Outfits sold on Monthly Payments System. For Particulars and
Catalogues write

RILEY BROS., 55 & 57, Godwin Street, Bradford, England.
A few days ago Mr. W. Tylar, of Birmingham, introduced a most compact form of acetylene lamp and generator, which will go bodily into any ordinary lantern; it is provided with a single burner and reflector, and is, Mr. Tylar informs us, automatic. One charge is said to last for a 2 hours’ exhibition. We understand it can be sold for 27s. 6d. We are to try this apparatus, and hope to give details of working in next issue.

"PERFECTION" CINEMATOGRAHP.

The new cinematograph termed "The Perfection," which is the outcome of experiments by Messrs. Baxter and Wray, of Bradford, appears to leave nothing to be desired. It is small in size, beautifully made, and is one of the simplest we have seen for engaging a roll of film. The end of the film is merely pushed through its slot and the handle turned when it is bound to fall right. No sprocket wheel is employed but instead two spring fingers engage into the perforations of the film and as soon as this has been drawn down the required distance they recede and move upwards to be again thrust out at the required space. No matter at what rate the machine may be driven it works with unfailing certainty and will cause the film to be moved backwards if desired with the same ease. Without any alteration whatever this machine will take films perforated with either the Lumiere or Edison gauge; in fact, the two styles of films can be used joined end to end. As we are to have the opportunity of giving this instrument an extended trial, we shall allude to its advantages again shortly.

DISSOLVING RESISTANCE.

Mr. F. J. Borland, of Leeds, has lately patented and placed upon the market a dissolving resistance for use with a bi-unial lantern and electric light, which will doubtless supply the proverbial long-felt want. Reference to the illustration will show the various attachments which are made when connecting it up. A and B are the main terminals to which the supply mains are connected, connection being made to the two lantern lamps at H I and J K respectively. The handle Y operates the switch shown on the top of the apparatus. This
switch is divided into two parts, which are, of course, insulated from each other. The body of the apparatus is occupied by resistance coils.

**BUGLE ATTACHMENT FOR PHONOGRAPHS.**
Mr. Philipp Wolff, of Southampton Street, W.C., who is quite noted in the cinematographic film line, has recently patented a new form of bugle for use with the phonograph which both in quality and volume of tone is a marked improvement on forms of apparatus hitherto in use in connection with the phonograph.

**THE SO-LI-TO CAMERA**
Is of novel style and folds up into small dimensions, so much so that when in its case it might be mistaken for a pair of field glasses. The sides of the camera are flexible and allow of its opening somewhat after the style of a pair of domestic bellows. This small instrument, which is made by Messrs. Butcher & Son, of Blackheath, takes quarter plates, has a single achromatic lens—fixed focus—rotating diaphragm time and instantaneous shutters, and is provided with three metal dark slides, which when the camera is folded are placed inside.

**LANERN SLIDE BOX.**
The new slide box brought out by this firm is both light and strong, being made of what is known as leather board or close millboard. The grooves, which are made of metal, are covered with paper and the top sides hinge over to facilitate the removal of any slide, while on the edge of the hinged portion is placed a series of numbers corresponding to the grooves.

**"OPTIMUS" HAND CAMERAS.**
Messrs. Perken, Son & Rayment have just placed upon the market several new styles of hand cameras, amongst which we find an improved model of their "Ubique Hand Camera," which is provided with a swing back acting both for horizontal and vertical positions. It is also fitted with a rising and falling front, three double dark slides, blind shutter, and is capable of being focused by means of a milled head at side. A sliding cover protects the ground glass.

**THE KOPTIT CAMERA (HAND OR STAND)**
is a very neat instrument which folds up into a remarkably small space. It opens easily, is fitted with Thornton-Pickard shutter, rack focusing adjustment, rising and falling front.
IMPORTANT TO ALL LIMELIGHT USERS!

BORLAND'S

PATENT SCISSORS ARC LAMPS

FOR

Direct and Alternating Currents.

Made in Three Types
Hand Feeding.
Self-Striking & Hand Feeding.
The “Dot.” The only automatic Arc Lamp in the market which fits all ordinary Optical Lanterns on the limelight tray without any alterations.


Prices’ Particulars, and Testimonials free on application to—

F. J. BORLAND,
Sheepscar Grove, LEEDS.

Maker of High-Class Optical Lanterns.

R. R. BEARD,
BEARD’S REGULATORS are the most perfect Regulators for producing the Best Light with Compressed Gas.—Price 30s.

BEARD’S PRESSURE GAUGE, fitted with Schaffer’s & Budenberg’s Patent Spring Back and Steel Tube, 30s.

BEARD’S NEW JET.


10, Trafalgar Rd., Old Kent Rd., S.E.
(Five Doors South of Lord Nelson.)

Established 1886.

FREDERICK J. STEDMAN,
Lantern Slide Maker and Colourist

103, ALBERT ROAD, BATTERSEA PARK,
LONDON, S.W.

THE “ABINGDON SAFETY”

Acetylene Gas Generator.

An immense success.
No trouble.
No waiting.
Needs no attention when once started.
No gas escapes when lights are turned down.
Water does not spill.
Can be recharged when lights are burning.
Acknowledged by practical experts to be the best for lantern work.
Every apparatus tested and guaranteed.

Price 37/6.

THE “MOSS” LANTERN JET will give a brilliant picture 30 feet from screen. Price 10/6.

EVERY LANTERN DEALER SHOULD STOCK THEM.

AGENTS WANTED.

The Abingdon Acetylene Illuminating Co., LIMITED,
97, GREAT HAMPTON ST., BIRMINGHAM.

The New Silver Lantern Screen (Patent.)
LEWIS WRIGHT & ANDERTON’S

SILVER SCREEN

Will practically more than double the illuminating power of oil lamp, incandescent gas, or acetylene.

If limelight or electric arc be your illuminant, you have at command the means of greatly increasing your light; or if you do not desire such increase, you can retain your present illumination at one half your present expenditure of gases or electricity.

With ordinary oil lamp or incandescent gas burner, a bright 9 feet picture (not disc) is obtainable.

“I expected a better illumination with it than with an ordinary opaque screen, and I was agreeably surprised to find the increase nearly double what I had expected.”—Editor, Optical Magic Lantern Journal.

“We were astonished at seeing the enormous increase in brilliancy which is attained by this screen.”—Photographic News.

Sole Makers—From all Dealers.

R. FIELD & CO., Lantern Manufacturers,
142, Suffolk Street, BIRMINGHAM.

—ESTABLISHED 1817—

BANKS & GREAVES,
366, Clapham Road, LONDON, S.W.
MANUFACTURERS OF

OPTICAL LANTERNS,
Photographic and Scientific Apparatus.

Lantern Slides by Wet Collodion Process. Customers’ Slides coloured by first-class Artists.
The Optical Magic Lantern Journal and Photographic Enlarger.

RILEY'S Marvellous Kineoptoscope

For showing Animated Photographs on the Screen. Patented in all Countries. Can be fixed into the Stage of an ordinary Lantern—an Advantage possessed by no other Apparatus.

PRICE, as shown here (without Jet) £17. Works splendidly.

Apparatus only ... £10:0:0
Complete, with Russian Iron Lantern, Alum Tank and Lens, in case ... £15:10:0.
Complete, with Mahogany Lantern, fitting into stage, as shown (Fig. 1) ... £17:0:0.
Do. as shown (Fig. 3) from £19:10:0 to £24.
Do. Bi-unial Lantern (Fig. 4) £24:10:0 to £32.

KINEOPTOSCOPE CAMERA for taking Cinematograph Negatives, 20 Guineas.

LIBERAL DISCOUNTS TO THE TRADE.

FILMS.

Our own make supplied, Wholesale and Retail. Good subjects. Steady motion.

ALL OTHER MAKERS' FILMS SUPPLIED.

Write for Kineoptoscope Pamphlet, Free on application.

RILEY BROTHERS,
55-57, Godwin St., BRADFORD, Eng.

Invite all interested in Projecting Apparatus to write them for particulars of this wonderful machine.

A challenge to all other machines for being steady, bright, devoid of flicker, strong, portable, and simple.

Professor Steen writes—"Success unprecedented; beats all other machines. Never had one breakdown."

6 Best Quality Films, assorted, from £18 upwards.

O. SICHEL & CO., 20, Berners Street, Oxford Street, LONDON.
with swing. When focusing a cloth is not required, as this camera has an automatic hood attached at ground glass which also serves to protect the glass when the camera is folded.

**THE "DE POCHE" CAMERA** is another excellent form of hand camera by the same makers. By simply turning the button at the side of camera the front racks out to the required focus, as per scale of distances shown in illustration. Like the first mentioned camera, this has a double swing back and a blind shutter. All these cameras are fitted with "Optimus" lenses and covered in leather.

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**No.** 6184. 14th March, 1898. Edward Munro Brown. Improved electric light for use as a search or signal light, or for photographic and other purposes.


7190. 24th March, 1898. George Croydon Marks. Improvements in and relating to stereoscopes. (Adolphe Blcck, France.)

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**SPECIFICATIONS PUBLISHED.**

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. F. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.


11273 of 1897. Baxter, Wray, and Oulton. Exhibiting kinetoscopic films, etc.


13052 of 1897. Grayson. Cameras for taking kinetoscopic photographs or animated pictures.


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"RADIOGRAPHY." By S. R. Bottone. London: Whittaker & Co., 3s.—In a series of 10 chapters, containing nearly 50 illustrations, the author gives a clear account of the particulars which have led to the discovery and application of those electric waves which are popularly known as X rays. Minute particulars are given as to the making of necessary apparatus, winding of sections, best form of tubes, etc. The whole book is most practical and at the same time interesting.

"PRACTICAL RADIOGRAPHY." By A. W. Isenthal and H. Snowden Ward, F.R.P.S. London: Dawbarn and Ward, Ltd., 2s. 6d.—This issue, which is the second edition, has been entirely rewritten, and treats of the subject under the following chapters:—Historical review of apparatus—Practical radiography—Electrical, photographic, medical, diagnostical applications of radiography—Therapeutic value of the X rays—General applications and probabilities—Theory of the X rays. About 60 fine illustrations accompany the text.

"ARCHITECTURAL PHOTOGRAPHY." By C. A. T. Middleton. London: Hazell, Watson & Viney, la.—Several articles which have from time to time appeared in the Amateur Photographer from the pen of Mr. Middleton, have been collated and arranged into one volume, together with a number of good illustrations.
MOUNTING CONDENSERS, ETC.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—Allow me to thank you and your correspondents, Mr. Srimgson and "Cracks," for the valuable information elicited in reply to my inquiries as to mounting condensers.

My query arose from the disasters I suffered with a new lantern, the condensers of which were very loose in the mounts, ¹⁄₄ inch play, or more. I broke four lenses in one evening’s experimenting with the new jets—very powerful mixed gas jets. Then I had new mounts made, but by an error of the mechanic the lenses were tight, though they would turn with one hand, as "Cracks" describes. I feared they were too tight, but since then I have never broken a lens. My conclusion from this, and from the fact that I have never broken a lens after turning down the light, nor when using the far more powerful electric arc light, was that condensers may easily be too loose, and are broken by the pitting of the lime and the consequent reflection of the gas flame, rather than by heat or cooling or by draughts. I am glad to know the degree of looseness in the mount which experts consider necessary, and my experience coincides with them.

Now, another question. What effect has a piece of stout glass, preferably plate, placed between light and condenser? Is there any objection to the practice. Will it break as easily as a condenser at the touch of the flame?

The great need of lanternists is, I think, a substitute for the soft, dirty, perishable, and costly lime. With the new refractory earths and metals at our command, it should be attainable. Who will invent or discover the new lantern, the condensers of which were very loose in one evening’s experimenting with the new jets—very powerful mixed gas jets. Then I had new mounts made, ¹⁄₄ inch play, or more. I broke four lenses in one evening’s experimenting with the new jets—very powerful mixed gas jets. Then I had new mounts made, but by an error of the mechanic the lenses were tight, though they would turn with one hand, as "Cracks" describes. I feared they were too tight, but since then I have never broken a lens. My conclusion from this, and from the fact that I have never broken a lens after turning down the light, nor when using the far more powerful electric arc light, was that condensers may easily be too loose, and are broken by the pitting of the lime and the consequent reflection of the gas flame, rather than by heat or cooling or by draughts. I am glad to know the degree of looseness in the mount which experts consider necessary, and my experience coincides with them.

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The great need of lanternists is, I think, a substitute for the soft, dirty, perishable, and costly lime. With the new refractory earths and metals at our command, it should be attainable. Who will invent or discover the substitute, and win a small fortune?

Yours truly,

"A READER."

Chicago,
March 19th, 1898.

[If you wish to interpose a piece of glass between the light and condenser let it be very thin. If you can get a bent piece (say a piece of Sugg’s large glass chimneys) you will find, for some reason or other, that it will stand better than a flat piece.—Ed.]

ANILINE COLOURS.

To Mr. J. Hay Taylor, Editor.

DEAR SIR,—I should esteem it a favour if any of your readers would give me suggestions as to colouring lantern slides with aniline colours. I am told these are now used exclusively in America, and that the effect produced is very much finer than oil or varnish paints.

Yours truly,

LANTERN OPERATOR.

H. B. R.—Speaking in a general sense, the method which you suggest is by no means new, although it is possible you may have a good modification. With respect to a sale “if you first patent it,” cannot you get the firm mentioned to sign an agreement to that effect. You will then have a firm footing. You did not enclose a sample print.

G. W. H. writes:—Who is responsible for a slide if it breaks by heat while in the lantern—the speaker and owner of the slide or the operator? Ans.—Most certainly the loss would be on the first-named party.

A. F.—It was because we saw the absurdity of the lists you speak of that we disclaimed all liability in the matter. The authority was placed at the heading of each. See our editorial explanation in the number for January.

W. L. R.—Compressed gas cannot be conveyed to the Channel Islands by steamer. It might, however, be taken by sailing vessel. An oxygen generator and saturator will probably be the best to employ.

J. Arnold Wright.—It would be unwise to use acetylene from a rubber bag (see "Notes" in this issue). The Hudlass pneumatic slide carrier and shutter works excellently, but for the size of slide used in your country (America), we think you would have to get one especially made, as only those for 3 by 3 slides are made commercially. However, write to Mr. Hudlass, you will find him ready to give every information.

N. G.—What is a lens protector, and where can I get such? Ans.—We can only suppose that a lens protector is for the purpose of protecting a lens. A bag in which the lens can be placed should answer as well as anything, this can be made in the home circle.

T.—By means of a hot burnisher.

X. Y.—The saturator which you have is evidently the old style issued by the firm named; this would only last two hours with a very small nipple, so they soon after ceased making that size, and substituted one of larger size and slightly different construction. You acted quite correctly; by preference, regulate at jet.

F. R. Overend.—The light-giving properties of the two lamps mentioned are about the same.

Wm. Read.—The regulator you have is now of old pattern, and was made by Messrs. Clarkson & Co. many years ago. It is difficult to say what price you should expect if you sold it, as so much depends on the state of the rubber bellows. If in working order you might expect 4s. or 5s.

Constant Reader.—To remove the varnish from the negatives without injury, place them in separate dishes and cover with alcohol; allow them to remain for several hours, then place in another dish for a few minutes containing clean spirit. This will remove all traces of the varnish.
Notice to the TRADE!

**CRETON LIME CYLINDERS.**

What are they? Answer.—They are a pure white and exceedingly hard species of imported lime, which is capable of giving a more intense light than any other lime ever put upon the market. They are made in two diameters. These limes have been submitted to severe tests by several experts, who unanimously pronounce them **UNPARALLELED** as intense light givers.

Imported and Manufactured by

H. NOYCE, 85, Nunhead Lane, PECKHAM RYE, S.E.

SANDS, HUNTER & Co.,
Photographic Apparatus and Lanterns,
NEW AND SECOND HAND, BY ALL THE BEST MAKERS.

Lanterns and Operator let out for evening entertainments for children, &c. Terms Moderate.

20, Cranbourne St., Leicester Square. London, W.C.

Dissolving View Magic Lanterns and Slides
Photographic Apparatus, Scientific Instruments and every description of miscellaneous property.

Mr. J. C. STEVENS begs to announce that he holds Sales of the above, every Friday, at half-past twelve precisely, at his great Rooms, 58, King Street, Covent Garden, London.

Gentlemen wishing to include property in these Sales are requested to send particulars one week prior to sale.

---

**SPECIAL.**

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