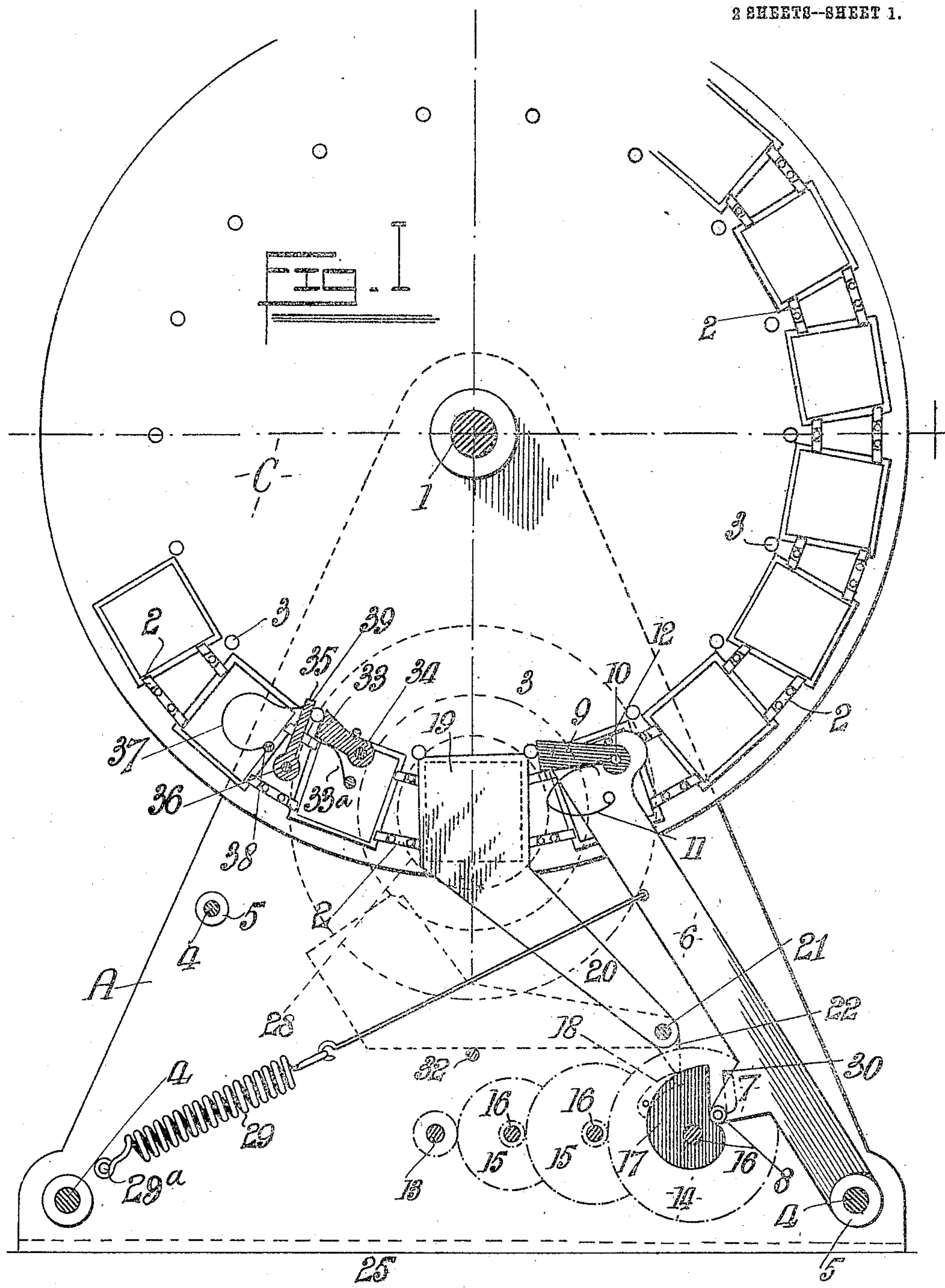


No. 891,175.

PATENTED JUNE 16, 1908.

H. INGRAM.  
AUTOMATIC MAGIC LANTERN.  
APPLICATION FILED AUG. 13, 1907.

2 SHEETS—SHEET 1.



Witnesses:-  
A. Wagner.  
Walter Allen

Inventor  
per Harold Ingram  
Herbert H. Jenner.  
Attorney

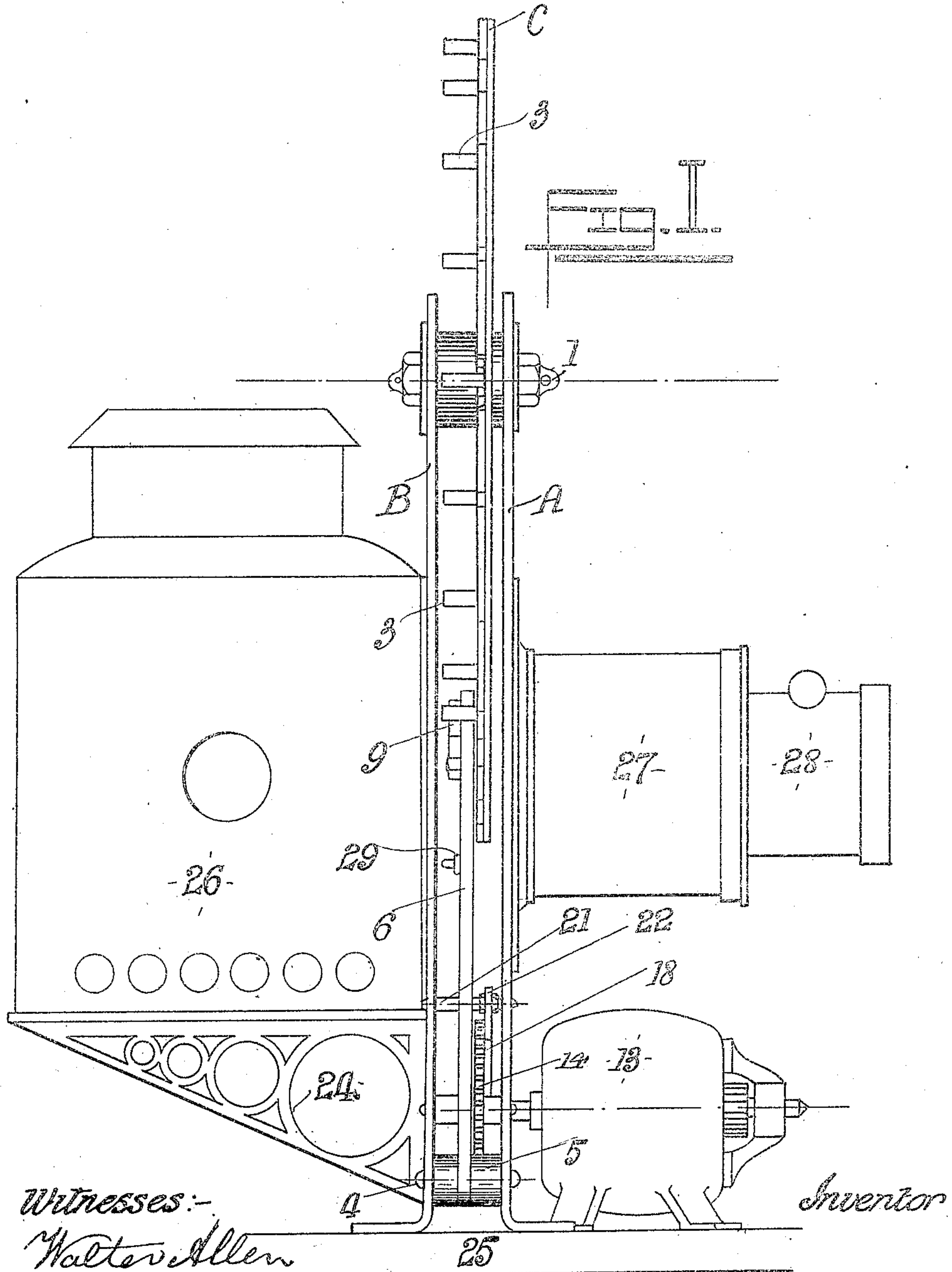
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# UNITED STATES PATENT OFFICE.

HAROLD INGRAM, OF LONDON, ENGLAND.

## AUTOMATIC MAGIC LANTERN.

No. 891,175.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed August 13, 1907. Serial No. 388,406.

*To all whom it may concern:*

Be it known that I, HAROLD INGRAM, engineer, residing at 30 Grays Inn road, London, W. C., England, have invented certain new and useful Improvements in Automatic Magic Lanterns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to optical lanterns, suitable for use in displaying automatically a series of advertisements, or pictures, the object being to produce a reliable machine which any unskilled attendant can operate. To carry this into effect I employ a revolving disk which carries a series of lantern slides and which is caused to intermittently rotate, and automatically bring each slide *seriatim* into the lens path of the lantern, expose it for a short period and then display the next slide. I preferably attain this result by means of a fixed speed electric motor geared down to a suitable ratio, which operates all the movements necessary for rotating the circular carrier, arresting it, releasing the shutter, making the exposure, replacing the shutter and again revolving the carrier for the next plate.

I will now proceed to describe my invention by means of the accompanying drawings in which:—

Figure 1. is a sectional part elevation.  
Fig. 2. is a side view.

In the drawings A is the front plate and B the back plate. Between the tops of these two plates is pivoted the revolving lantern slide carrier C. The carrier is mounted on a spindle I, and is of a diameter corresponding to the number of plates or slides to be displayed, it is fitted with a series of plate carriers 2, and between each carrier are pins 3. The plates A and B are screwed together by means of screw pins 4, upon which are distance pieces 5. Preferably pivoted on one of the pins 4, at the base of the machine is a pawl ratchet arm or lever 6, having a right angled limb 7, carrying a roller 8, at its extremity, and a ratchet pawl 9, at the top end of said arm. The pawl 9, is pivoted at 10, and spring 11, reacts against its under face, the travel of such pawl 9, being limited by a pin 12. The pawl 9, is formed to engage with the carrier pins 3.

The motor 13, which for the sake of simplicity I prefer to be electrical, (but which

may be replaced by any good equivalent prime mover such as a clockwork device or hot air engine) drives a geared cam carrying wheel or disk 14, through the train of speed reducing wheels 15; the said cam wheels and spur gears being pivoted on spindles 16, having bearings in the front and back plates A and B. The cam disk 14, carries on one face a snail cam 17, which actuates the carrier rotating mechanism, and on its other face it carries a short cam 18, which operates the shutter mechanism. This latter consists of a shutter 19, mounted on a lever 20, securely mounted on a spindle 21, the same spindle carries a fast depending cam wiper 22, engaging with the shutter cam 18, once every revolution of the cam wheel 14. The plates A and B are screwed to a base board 25, and also mounted upon this or on a bracket 24, is the lantern 26, which has the usual means of producing a strong light, for this particular type of work I prefer to have an electric arc lamp, of the scissors, or other self centering type. This lantern 26, is preferably attached to the back plate B, of the machine and each plate in the carrier is arranged to stop immediately in a central position in the path of its light.

Lantern tubes 27 and 28 provided with picture-projecting lenses of approved construction are carried by the plate A so that the pictures on the slides may be projected onto a suitable sheet or screen. A spring 29 is arranged between the arm 6 and a stationary pin 29<sup>a</sup> to hold the pawl 9 in engagement with the pins 3 and to revolve the plate C step by step. A guide 30 is arranged on the cam-plate opposite the straight face of the cam, so as to form a passage for the roller 8.

The operation of my invention is as follows:—The lantern is lighted and the lens cup removed. The motor is then set in motion by a suitable switch, and as only a small current is required I may use an adapter in conjunction with an 8 c. p. lamp holder. This causes the cam wheel 14, to revolve releasing the shutter, and exhibiting the picture. As the cam wheel revolves, the arm 6, through the engagement of its roller 8, with the cam face, is caused to recede backwards against the pull of the contractile spring 29, until the ratchet pawl has passed under the next pin 3, on carrier face. By this time the shutter cam 18, has come into engagement with the shutter wiper 22, causing the shutter to suddenly move upwards and obscure the picture



(as shown in Fig. 1). The ratchet pawl arm roller 8, has by now reached the apex of the cam 17, and the pawl passing beyond the carrier pin now presses against its side. On the cam wheel revolving the wiper suddenly falls, allowing the spring to pull backwards, the ratchet pawl arm 6, which brings with it the slide carrier disk, against one of whose pins 3, the pawl 9 is pressing. The carrier is rotated until the cam wiper 8, occupies the position shown in Fig. 1, when a fresh plate is in position for exposure. At this point the shutter cam wiper runs off its cam the shutter falling of its own weight against a pin 32. As an arresting device against shock when driving the carrier forward, I provide a check pawl 33, pivoted at 34, to a headed pin on plate B and pressed upon a spring 33<sup>a</sup>. This clicks over the pins as they pass holding same firmly against the spring stop 35. This latter is a straight faced arm pivoted at 36, pressed forward by a bent spring 37, fixed at one end to a pin 38, its other end 39 being inserted in a small hole or slot in the arm. To prevent the spring jumping out of the slot it is bent in the manner shown in Fig. 1.

From the foregoing it will be observed that I achieve my object with a very simple and inexpensive mechanism, and which is automatic from the start requiring no skilled attention whatever.

I claim:—

1. The combination, with a supporting frame, of a lantern and lens-tubes secured to the middle part of the said frame, a disk for the lantern-slides journaled above the

axis of the said lantern and lens-tubes and revolving between them and provided with a series of driving-pins, an arm having its lower end pivoted to the said frame below the said disk and having a pawl at its upper end for engaging with the said pins, an operating spring connected to the upper end portion of the said arm, a cam operating on the lower end portion of the said arm near its pivot, and driving mechanism for revolving the said cam.

2. The combination, with a supporting frame, of a lantern and lens-tubes secured to the middle part of the said frame, a disk for the lantern-slides journaled above the axis of the said lantern and lens-tubes and revolving between them and provided with a series of driving-pins, an arm having its lower end pivoted to the said frame below the said disk and having a pawl at its upper end for engaging with the said pins, an operating spring connected to the upper end portion of the said arm, a cam operating on the lower end portion of the said arm near its pivot, a shutter also pivoted to the said frame below the said disk and provided with a wiper, a cam which engages with the said wiper and oscillates the shutter periodically, and driving mechanism for revolving the two said cams.

In testimony whereof I affix my signature, in presence of two witnesses.

HAROLD INGRAM.

Witnesses:

H. D. JAMESON,  
F. HERON ROGERS.