

(No Model.)

2 Sheets—Sheet 1.

D. R. BREED.
MAGIC LANTERN.

No. 488,057.

Patented Dec. 13, 1892.

Fig. 1.

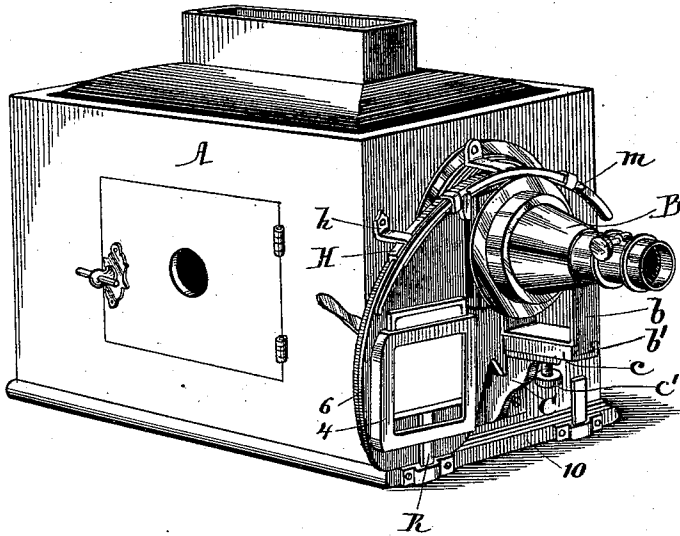
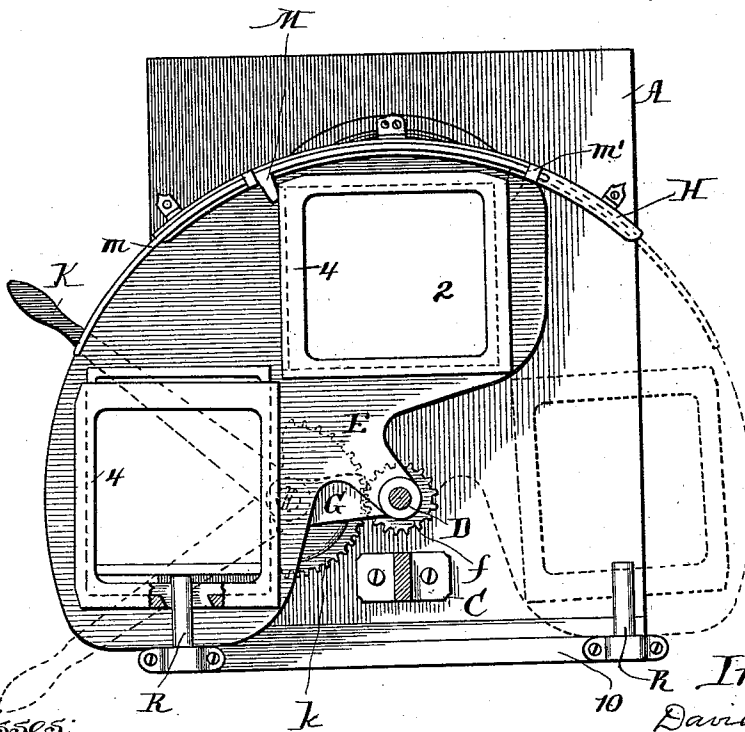


Fig. 2.



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Fig. 3.

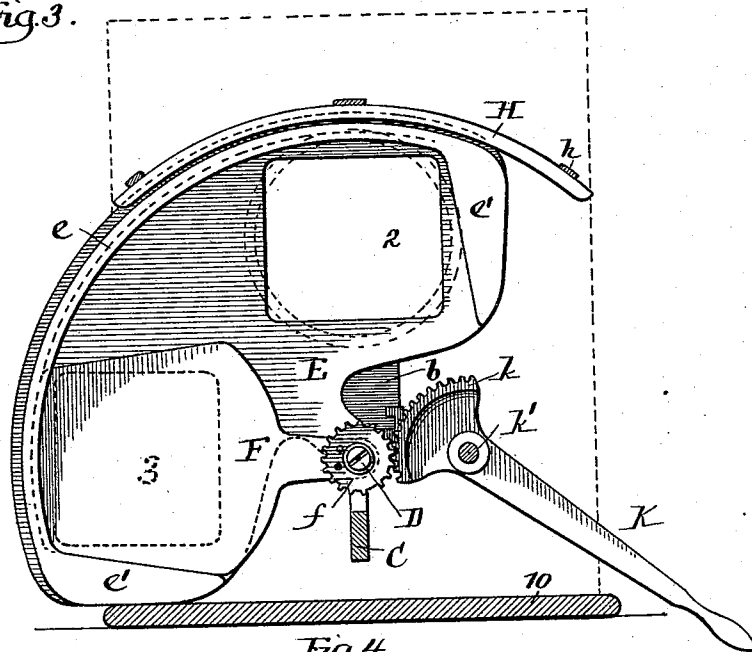
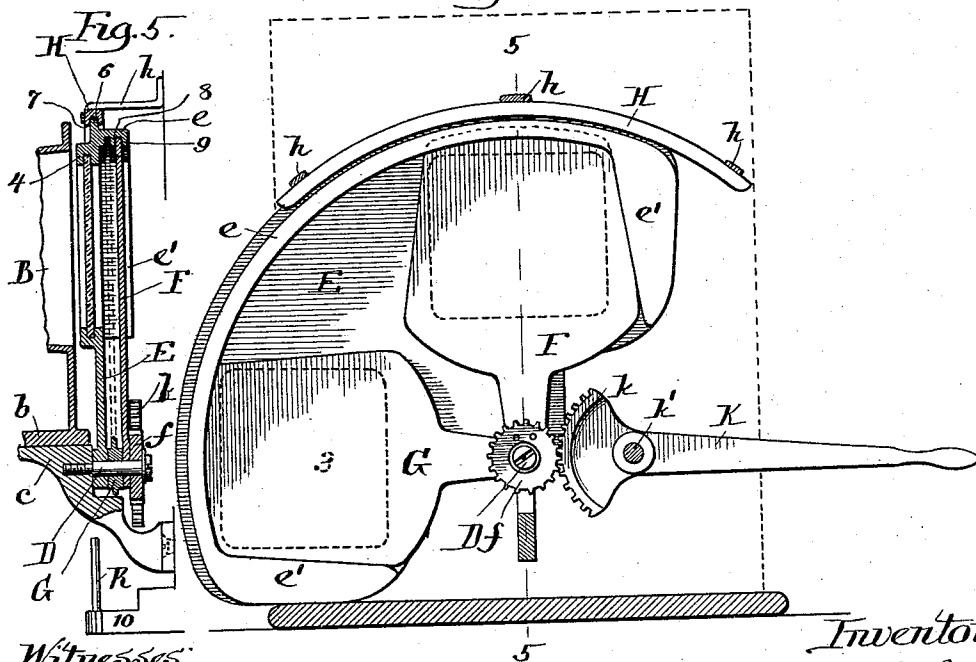


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MAGIC LANTERN.

SPECIFICATION forming part of Letters Patent No. 488,057, dated December 13, 1892.

Application filed May 7, 1892. Serial No. 432,107. (No model.)

To all whom it may concern:

Be it known that I, DAVID R. BREED, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Magic Lanterns, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In successively exhibiting views by magic lanterns it is desirable that the illuminating-lens shall be obscured during the time that the picture-slide immediately in front of such lens is being removed and until the next succeeding picture-slide is brought into proper position in front of the lens, and it is important that the slides shall be quickly presented and removed.

To this end my invention has for its object, primarily, to provide an improved slide-carrier and shutters whereby the picture-slides can be quickly presented and removed from in front of the illuminating-lens and whereby the light through such lens shall be obscured during such operation.

To this end my invention consists in the improved mechanism hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a perspective view of a magic lantern having my improvements applied thereto. Fig. 2 is a view in front elevation, the lens-tube, its carrier, and a part of its bracket being removed. Fig. 3 is a rear view of the slide-carrier and shutter and the operating mechanism therefor, parts being shown in section. Fig. 4 is a view similar to Fig. 3, but showing the parts in different position. Fig. 5 is a view in vertical section on line 5 5 of Fig. 4, a part of the magnifying-lens tube and its bracket being broken away.

A designates the body of a lantern, within the front of which is sustained in the usual manner the illuminating-lens, and in front of this illuminating-lens is mounted the cone or tube B, whereby the magnifying-lens is carried. This cone or tube B is preferably mounted upon a carrier *b*, the dovetailed portion *b'* of which slides within a corresponding dovetailed groove formed in the upper face

of the block *c*, fixed upon the top of the cone-bracket C. A thumb-screw *c'* passes through a threaded perforation in the block *c* and serves to determine the position of the carrier *b*, and consequently of the lens-cone, this connection between the bracket C and the cone-carrier *b* also permitting the cone to be readily removed when necessary. At the back of the bracket C (see Fig. 5) is fixed a stud or shaft D, whereon is journaled the slide-carrier E and the shutters F and G. The slide-carrier E is provided with two sight-openings 2 and 3, the edges of which are bounded by the rims 4, whereby the transparent picture-slides are sustained, the rims 4 being open at one end to permit the slides to be freely inserted into and withdrawn therefrom. The slide-carrier E, being journaled upon the stud or shaft D, swings in the arc of a circle of which such stud or shaft D is the center, and the periphery of the slide-carrier E is preferably formed with a rib 6, that is held in a manner free to slide within a groove 7 of the curved guide-bar H, that is attached by means of brackets *h* to the end of the lantern. (See Fig. 5.) By preference, also, the slide-carrier E is provided upon its inner side adjacent its periphery with a rim *e*, in which are formed the curved grooves 8 and 9, in which are guided the edges of the shutters F and G. As the shutters F and G are pivoted upon the stud or shaft D, it follows that the grooves 8 and 9 in the rim *e* of the slide-carrier E will be curved to permit the easy movement of the shutters. At the ends of the rim *e* of the slide-carrier E are formed the extensions *e'*, which act as stops against which the shutters F and G will contact, as will presently more fully appear. The shutter F has fixed thereto the pinion *f*, journaled upon the stud or shaft D, and with this pinion *f* engages the segment-gear *k*, that is formed upon or attached to the inner end of the operating-lever K, this lever being journaled upon a stud or pin *k'*, projecting from the end of the lantern. Hence it will be seen that the shutter F will be positively moved by the operating-lever K. The shutter G, which may be termed a "gravity-shutter," will be shifted by the slide-carrier in a manner to be presently defined.

The operation of my improved apparatus

as thus far described will be seen to be as follows: Assuming the parts to be in the position shown in Figs. 1 and 2 of the drawings, with picture-slides in the rims 4 of the openings 2 and 3 of the slide-carrier, it is plain that the picture-slide in front of the illuminating-lens will be exhibited, as the shutters F and G will at such time be opposite the lower sight-opening of the slide-carrier. If now it is desired to bring the picture-slide within the sight-opening 3 of the slide-carrier in position to be exhibited, it is only necessary to depress the operating-lever K to the position shown by dotted lines in Fig. 2 of the drawings. This depression of the operating-lever K will through the medium of the segment-gear k and the pinion k' cause the shutter F to swing in front of the opening of the slide-carrier, thereby first obscuring the picture-slide and causing the edge of the shutter F to contact with the stop e' at the adjacent end of the slide-carrier, and as the operating-lever K is still further moved in downward direction the shutter F thus bearing against the stop e' will cause the slide-carrier E to turn about its pivot-point from the position shown by full lines in Fig. 2 to the position shown by dotted lines in Fig. 2. As the slide-carrier E is thus turned from the position shown by full lines in Fig. 2 to the position shown by dotted lines the second sight-opening 3 of the slide-carrier will be brought opposite the illuminating-lens and in position to exhibit the second picture-slide; but as the slide-carrier is thus shifted the shutter G will remain in front of the sight-opening 3 of the slide-carrier until such sight-opening 3 is opposite the illuminating-lens. At such time the end of the slide-carrier E will contact with a stop 10 at the base of the lantern and the further movement of the slide-carrier will be arrested; but inasmuch as the shutter G is free to continue its travel it is manifest that the momentum acquired by this shutter as it was lifted by the slide-carrier will cause the shutter to further move and drop by its gravity away from in front of the sight-opening 3 of the slide-carrier, and consequently expose the picture-slide opposite such sight-opening. While the second picture-slide is thus being exposed the operator can withdraw the picture-slide first exhibited and replace it by a fresh slide, so that when the operating-lever is next raised from the position shown by dotted lines in Fig. 2 to the position shown by full lines in Fig. 2 and the slide-carrier E and shutters are reversed (the operation being the same as that last defined) a new picture will be presented in front of the illuminating-lens. Hence it will be seen that at each movement of the operating-lever the pivoted slide-carrier and the shutters will be shifted in such manner that the picture-slide being exhibited will first be obscured by the shutter F. The slide-carrier will then be moved so as to present a new picture in front of the illuminating-lens, and finally the

shutter G, obscuring such new picture, will by its momentum or gravity fall, so as to expose such new picture.

In order to prevent the picture-slides from being thrown from out of the rims 4 of the slide-carrier as such carrier is shifted back and forth, I provide a movable stop M, that projects from a slide-bar m , movably sustained within guide-loops m' , attached to the face of the guide-plate H, and it will be seen that as the slide-carrier is shifted, for example, from the position shown by full lines in Fig. 2 to the position shown by dotted lines in such figure the stop M will extend in front of the open end of the rim 4, whereby the picture-slide is held, and will prevent the slide from being thrown out of such rim, as the movement of the stop M will be arrested when such stop reaches the loop m' . So, also, when the operating-lever is reversed to shift the slide-carrier from the position shown by dotted lines to the position shown by full lines in Fig. 2 it is manifest that the movable stop M will in like manner serve to obstruct the open end of the rim 4 and prevent the picture-slide opposite the side opening 2 from being thrown out of position. In order to enable the slides to be quickly withdrawn from the slide-carrier after they have been exhibited, I form the rims 4 with cut-away spaces at their bottoms, as shown by full lines in Fig. 2, these cut-away spaces serving to admit the discharge-pins R, that project at the front of the lantern, as seen in Figs. 1, 2, and 5, so that as the slide-carrier is shifted from one position to another the corresponding pin R will pass through the cut-away space of the slide-carrier rim 4 and will lift the slide held thereby sufficiently to permit the operator to readily withdraw it from the carrier. By thus providing a slide-carrier arranged to move in the arc of a circle in front of the illuminating-lens much less space is required for such slide-carrier than would be needed if such slide-carrier were arranged to reciprocate merely back and forth in front of the illuminating-lens, and by the provision of the operating mechanism above described a very quick and easy movement of the slide-carriers and the shutters is secured.

It is manifest that the precise details of construction above set out can be varied within wide limits without departing from the spirit of my invention and that certain features of my invention may be employed without its adoption as an entirety.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a magic lantern, of a movable slide-carrier provided with two slide-openings and slide-holders, two shutters, each arranged to be moved in front of either of the slide-openings of the carrier, and means for imparting movement to said carrier to bring its slide-openings in front of the lantern-lens and for imparting movement to the shutters to bring them in front of either of the

slide-openings of the carrier, substantially as described.

2. The combination, with a magic lantern, of a slide-carrier having the slide-openings therein and mounted to move in curvilinear direction in front of the lens-opening, two shutters, each arranged to be moved in front of either of said slide-openings, and means for imparting curvilinear movement to said carrier and to said shutters, substantially as described.

3. The combination, with a magic lantern, of a movable slide-carrier provided with two slide-openings, two shutters movable with respect to said slide-carrier, one of said shutters being arranged to fall by gravity when the slide-carrier is shifted to bring said shutter beyond its vertical position, and means for imparting a curvilinear movement to said slide-carrier and said shutters in order to bring the slide-opening opposite the lens and in order to bring one of said shutters in position to fall by gravity, substantially as described.

4. The combination, with a magic lantern, of a movable slide-carrier having two slide-openings, two shutters shiftable to obstruct either of said slide-openings, and means for moving one of said shutters in front of the slide-opening opposite the lens before the slide-carrier is shifted and for shifting the carrier to bring the other slide-opening in front of the lens with the shutter opposite thereto, whereby in changing the slides the exposed slide will be obscured and removed before the new slide is brought in front of the lens, substantially as described.

5. The combination, with a magic lantern, of a slide-carrier having slide-openings therein, a movable shutter arranged to shift said carrier, means for actuating said shutter, and a second shutter arranged to be shifted by said carrier, substantially as described.

6. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein, two pivoted shutters for obstructing the openings of said slide-carrier and shiftable in front of either of said openings, said slide-carrier and shutter being sustained to move in curvilinear direction, and suitable means for shifting said slide-carrier and shutters, substantially as described.

7. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein, two pivoted shutters, and an operating-lever for swinging one of said shutters and causing said shutter to operate the slide-carrier, substantially as described.

8. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein, a curved guideway for said slide-

carrier, and suitable lever mechanism for rocking said carrier about its pivot-point and for effecting the shifting of the shutters, substantially as described.

9. The combination, with a magic lantern, of a pivoted slide-carrier, two pivoted shutters, a shaft whereon said slide-carrier and shutters are pivoted, a pinion connected to one of said shutters, and a rack-bar and operating-lever for operating said slide-carrier and shutters, substantially as described.

10. The combination, with a magic lantern, of a pivoted slide-carrier, two shutters pivoted concentrically with said slide-carrier, and a rack-bar and pinion and operating-lever for shifting said slide-carrier and shutters, substantially as described.

11. The combination, with a magic lantern, of a pivoted slide-carrier provided with a rim having curved grooves therein, two pivoted shutters having their edges held in a manner free to move within said grooves of the slide-carrier, a gear-pinion connected to one of said shutters, and an operating-lever provided with a curved rack-bar engaging the said pinion, whereby the slide-carrier and shutters may be shifted, substantially as described.

12. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein and having stops at each end with which the shutters may engage, two pivoted shutters for obstructing the sight-openings of the carrier, a pinion connected to one of said shutters, and an operating-lever and rack-bar for engaging with said pinion, substantially as described.

13. The combination, with a magic lantern, of a slide-carrier having openings therein, two shutters, a pinion and rack-bar for operating one of said shutters, the other of said shutters being free to turn about its pivot-point, and stops on the slide-carrier for engagement with the shutters, substantially as described.

14. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein, suitable rims or holders about said slide-openings, and pins for partially lifting the slides from said rim or holder, substantially as described.

15. The combination, with a magic lantern, of a pivoted slide-carrier having slide-openings therein and having open rims or holders for the slides and a shifting stop for preventing the slides being thrown from the slide-carrier during its swinging movement, substantially as described.

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