

(No Model.)

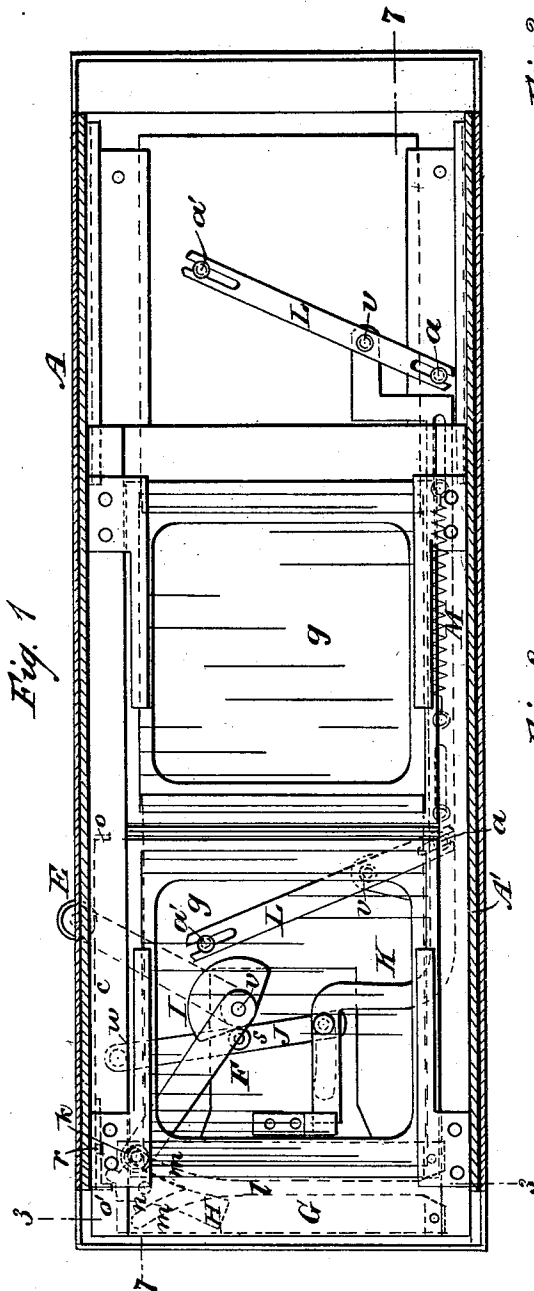
2 Sheets—Sheet 1.

H. W. FORCE

ATTACHMENT FOR STEREOPTICONS, MAGIC LANTERNS, &c.

No. 482,238.

Patented Sept. 6, 1892.



WITNESSES:

Donn Twitchell
Co. Sedgwick

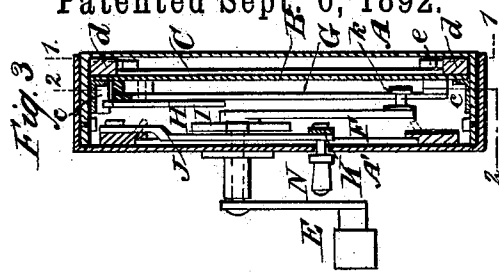
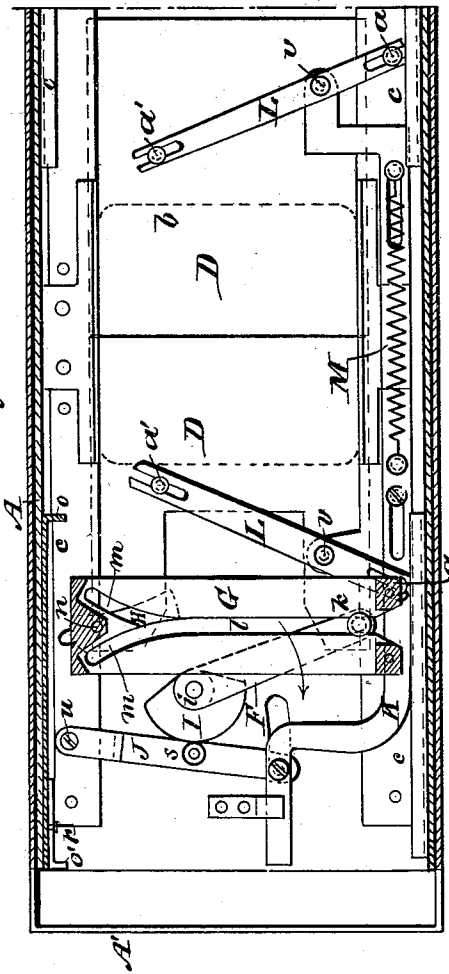


Fig. 2



INVENTOR:

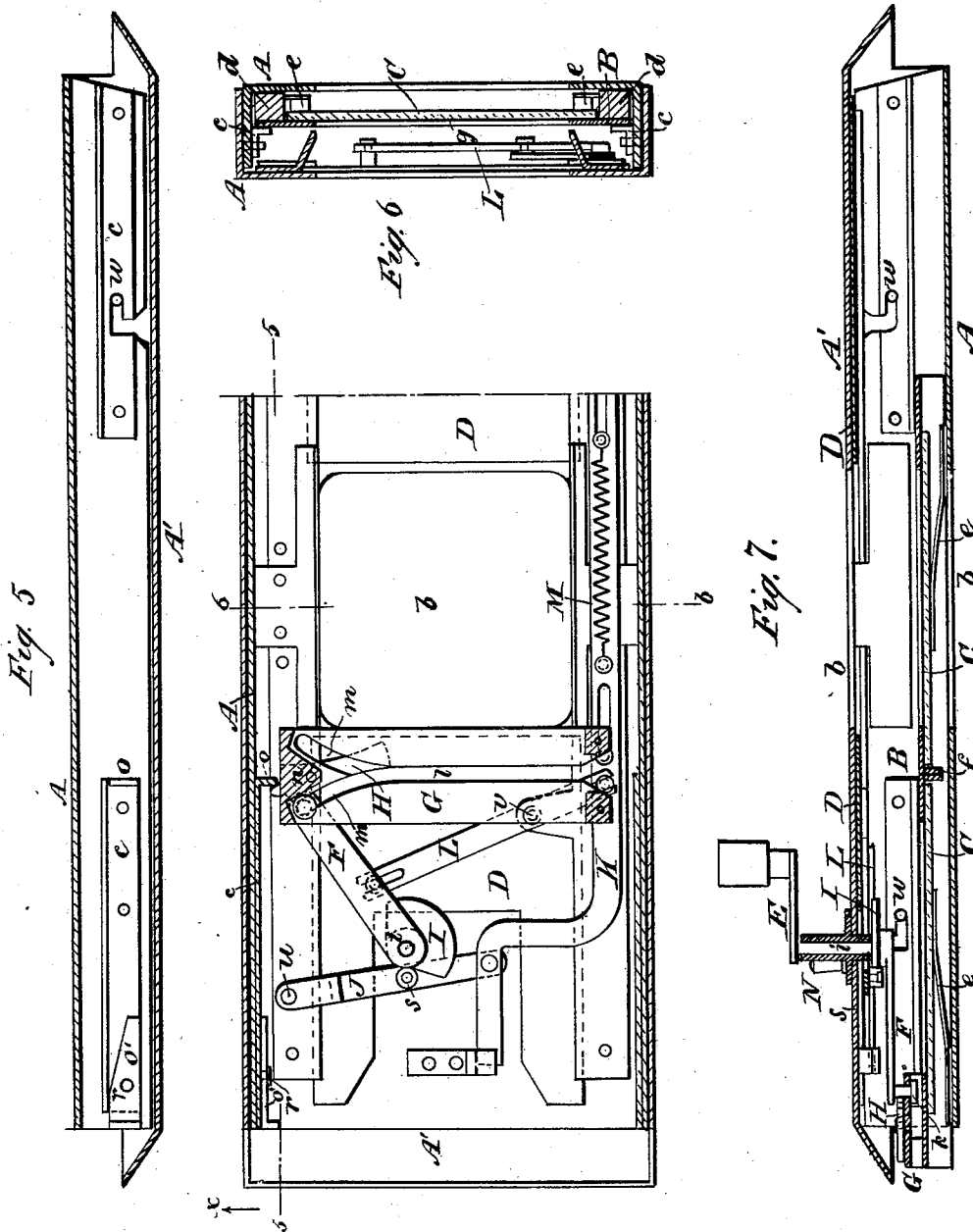
H. W. Force
BY *Munn & Co*
ATTORNEYS

H. W. FORCE.

ATTACHMENT FOR STEREOPTICONS, MAGIC LANTERNS, &c.

No. 482,238.

Patented Sept. 6, 1892.



WITNESSES:
Donn Titchell
C. Badgerick

Fig. 4

INVENTOR:
H. W. Force
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

HORACE W. FORCE, OF NEWBURG, NEW YORK.

ATTACHMENT FOR STEREOPTICONS, MAGIC LANTERNS, &c.

SPECIFICATION forming part of Letters Patent No. 482,238, dated September 6, 1892.

Application filed November 23, 1891. Serial No. 412,703. (No model.)

To all whom it may concern:

Be it known that I, HORACE W. FORCE, of Newburg, in the county of Orange and State of New York, have invented a new and Improved Attachment for Stereopticons, Magic Lanterns, and the Like, of which the following is a full, clear, and exact description.

The object of this invention is to provide for the successive exposure—as, for instance, to a public audience—of a series of different picture-transparencies in optical instruments of the magic-lantern class without producing that unpleasant effect of the views which are thrown upon the screen being seen to pass on and off the latter, and also dispensing with the necessity of using in all cases what is known as a “double-dissolving” instrument.

The invention consists in the combination and arrangement of parts, as hereinafter described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a longitudinal sectional elevation upon the line 1 1 in Fig. 3 of a magic-lantern device or attachment embodying my invention, looking toward the rear of the case. Fig. 2 is a further longitudinal sectional elevation in part, mainly upon the line 2 2 in Fig. 3, also looking toward the rear side of the case. Fig. 3 a transverse vertical section mainly upon the irregular line 3 3 in Fig. 1. Fig. 4 is a longitudinal sectional elevation in part similar to Fig. 2, but showing the working parts in a different position. Fig. 5 is a horizontal section, mainly upon the line 5 5 in Fig. 4, looking in direction of the arrow *x*. Fig. 6 is a vertical transverse section upon the line 6 6 in Fig. 4; and Fig. 7 is an irregular horizontal section, mainly as indicated by the line 7 7 in Fig. 1, looking downward.

A A' is a hollow metal case of any suitable length, depth, and thickness, but which I ordinarily make from twelve to fourteen inches long, four inches deep, and five-eighths to three-fourths of an inch thick to fit within the slotted part in front of the condensing-lenses of a magic lantern where the usual transparencies or slides are placed and which will fit any such lantern that will securely

hold any mechanical slide or transparency. This case A A' is made in two longitudinal sections adapted to fit one within the other and suitably united by bayonet-fastenings *w* and screws or otherwise to provide for the introduction and removal or repair, when necessary, of the interior mechanism. These two front and back halves of the hollow case are provided each with a central exposing-aperture *b* opposite each other for the slide or transparency, and the case is made open at its ends to receive and remove, as required, the slides or transparencies.

B is a sliding transparency-carrier arranged to reciprocate longitudinally within the case between the front longitudinal half A thereof and interior ways *c c* on said half-case, longitudinal spacing-strips *d d* being secured at top and bottom to the front side of said carrier to admit of two transparencies or slides C C being introduced one alongside the other between said front half of the case and the front side of the carrier and to provide for the introduction at top and bottom of friction-springs *e e* to hold the transparencies within the carrier, with facility for removing them to replace them by others, when required, from opposite ends of the carrier. Said carrier B, which is made with open ends for this purpose and with a central vertical dividing rib *f* for the inner ends of the transparencies C C to butt up against when in place, is constructed with two exposing-openings *g g*, arranged side by side in front of the transparencies when the latter are in place, each of said openings *g* being made to conform to the exposing-aperture *b* in the front and back halves of the case as they are successively brought opposite the latter by the intermittent longitudinal reciprocating carrier B.

The back longitudinal half A' of the case is provided on its inner face side with a shutter, which is here shown as made in two sections or halves D D, to close the exposing-opening *b* in the longitudinal half-front of the case when it is required to change the exposure of the one transparency C for the other by the reciprocation of the carrier B, so as to exclude the light at such time from being thrown on the exhibiting-screen, and thereby prevent the undesirable effect of the picture or view being seen as passing onto

and off the screen by the audience or lookers-on when the exposure of the one view or picture in the carrier is changed for the other. The mechanism which I have provided for this purpose and for reciprocating the transparency-carrier is, with the exception of an outer crank and a sliding handle or knob, wholly within the case, and is substantially as follows: E is a hand-crank arranged externally of the back half A' of the case near its one end and fitted on or secured to a horizontal spindle *i*, projecting a limited distance within the case. This spindle *i* carries on its inner end a second crank or arm F, which is provided on its outer end with a flanged roller *k*, that works in an upright slot or groove *l* in a plate G, attached to one end of the sliding carrier B for the purpose of reciprocating and controlling the movement of the latter, said slot or groove terminating at its one end in opposite curved branches *m m*, corresponding in curvature to that of the arc in which the roller *k* of the crank or arm F travels. As the crank E is worked backward and forward—that is, alternately to the right and left—short of a complete circle, the roller *k* presses alternately on opposite sides of the upright portion of the groove *l* to move the transparency-carrier B backward and forward, so as to bring the exposing-openings *g g* successively and intermittently opposite the exposing-apertures *b b* in the case; but during such backward and forward movement of the crank—that is, after the roller *k* has moved the carrier B in either direction to bring either one of its exposing-openings *g* opposite the exposing-apertures *b b* in the case—the roller *k* toward the completion of the crank-stroke travels in one or other of the curved branches *m m* of the groove, whereby the carrier after it has been thrown to the right or left into an exposing position remains stationary for a while, or as long as desired, and until the crank's motion is reversed to give the necessary exposure of either transparency C. A pendent switch H, pivoted, as at *n*, to the plate G, is shifted as the roller *k* approaches or is about to enter either curved branch *m* to insure the roller passing into the right branch *m* to effect the necessary pause at either end of the travel B of the carrier, said switch being shaped to conform on its opposite side edges to the inner curvature of the branches *m m* and extending beyond them. This switch H is thus shifted and held in its shifted positions for the necessary period of time by a tail end on the pivoted switch striking and remaining in contact with the one or other of two stops *o o'* at opposite ends of one carrier-way *c* at the crank end portion of the case. The inner one of these stops *o* is a fixed one, but the outer one *o'* is pivoted, as at *r*, to admit of its being turned out of the way of the plate G and its switch H when it is required to draw the carrier B out of the case for cleaning and repairing or for other purposes.

The shutter or shutters D D are operated in timely relation with the transparency-carrier B, so that they close before the movement of said carrier in either direction takes place and remain closed till the carrier has been brought into exposing position of either of its transparencies C C, and either of its exposing-apertures *g g* are opposite and remain opposite the exposing-apertures *b b* in the case, in order that the views exposed on the screen may not be seen as coming on and passing off the screen, which is the object of the invention. This is done by the same motion of the crank E that in due order reciprocates the transparency-carrier B, subject to its intervals of rest while exposing, as hereinbefore described. Thus on the spindle *i* of the crank E is an arc-shaped cam I, which, on being partly rotated in reverse directions in common with the crank, acts by the curved marginal portion of its figure to keep the shutters closed while the carrier B is about to be moved or is in motion and changes its exposing position from the one transparency to the other. This is done by the curved portion of the cam acting upon or against a stud or roller *s* upon an arm J, pivoted, as at *u*, and which is connected at its opposite end with a longitudinally-sliding bar or frame K, suitably guided and supported and connected with the shutters D D by slotted arms or levers L L, pivoted, as at *v v*, and engaging with pins *a' a'* on the sliding frame and shutters, said arms L L being connected, respectively, on opposite sides of their pivots *v* with the sliding frame. A spring M, applied to this sliding frame K, serves to quickly draw it back to open the shutters at the proper time to make the exposure after the curved portion of the cam I has in the turning of the crank E cleared the roller *s* on the arm or lever J, when or before which the carrier B has been brought into either one of its exposing positions.

When it is required, as sometimes is the case, to close the shutters and keep them closed without intermittently reciprocating the carrier, as described, then instead of operating the crank E the shutters may be independently closed by an outside sliding knob or handle N, working along a slot in the case and directly connected with the sliding frame K, with which the shutters are connected, as described. It will be observed that a slight motion forward of the operating-crank causes the cam to act upon the levers, thus quickly closing the shutter before the view is moved. A further movement causes the roller on the end of the inside crank or lever to quickly move the carrier and views across the field of the instrument. A still further motion of the operating-crank releases the shutter-operating mechanism and permits the shutters to open quickly. The entire movement of the operating-crank amounts to about three-quarters of a revolution. The internal mechanism is so arranged that the shutters close and open

while the carrier is stationary, and the construction is such as to permit of a practically instantaneous change of the views without showing them in motion on the screen.

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

1. In a slide-changing and light-eclipsing carrier adapted for insertion in the slide-receiver of the lantern, the combination of a slide adapted for carrying lantern-transparencies, a shutter for closing the aperture of the lantern, and mechanism connected with the slide carrier and shutter, substantially as described, for moving the slide-carrier while holding the shutter closed and then opening the shutter while the slide-carrier is stationary, the cycle of operations being effected by a single movement of the operating-lever in one direction.

2. In an attachment for magic lanterns and other like optical instruments, the combination of the tubular case A A', having opposite front and rear openings *b b* in its sides, the sliding divided shutter or shutter-sections D, the outside crank E, with its spindle *i*, the

inner crank F on said spindle, the cam I, the arm or lever J, adapted to be actuated by said cam in one direction, the sliding frame K, the reverse arms or levers I, L, connecting said sliding frame with the shutter-sections, and the spring M, controlling the opening of the shutter, substantially as specified.

3. In an attachment for magic lanterns and other like optical instruments, substantially as specified, the combination, with the tubular case A A', having opposite exposing-openings in its front and rear sides, of the sliding double transparency-carrier B, having double exposing-openings *g g* arranged side by side, the outer crank E, with its attached spindle *i*, and inner crank F, having an outer stud or roller *k*, the upright or piece G, attached to the transparency-carrier, having an upright groove *l*, with reversely-curved end branches *m m*, the switch H, the fixed stop *o*, and movable stop *o'*, essentially as described.

HORACE W. FORCE.

Witnesses:

HENRY KOHL,
FRANK W. TOMPKINS.