(No Model.) 4 Sheets—Sheet 1.

W. E. SCHNEIDER.

CAMERA.

No. 433,746. Patented Aug. 5, 1890.

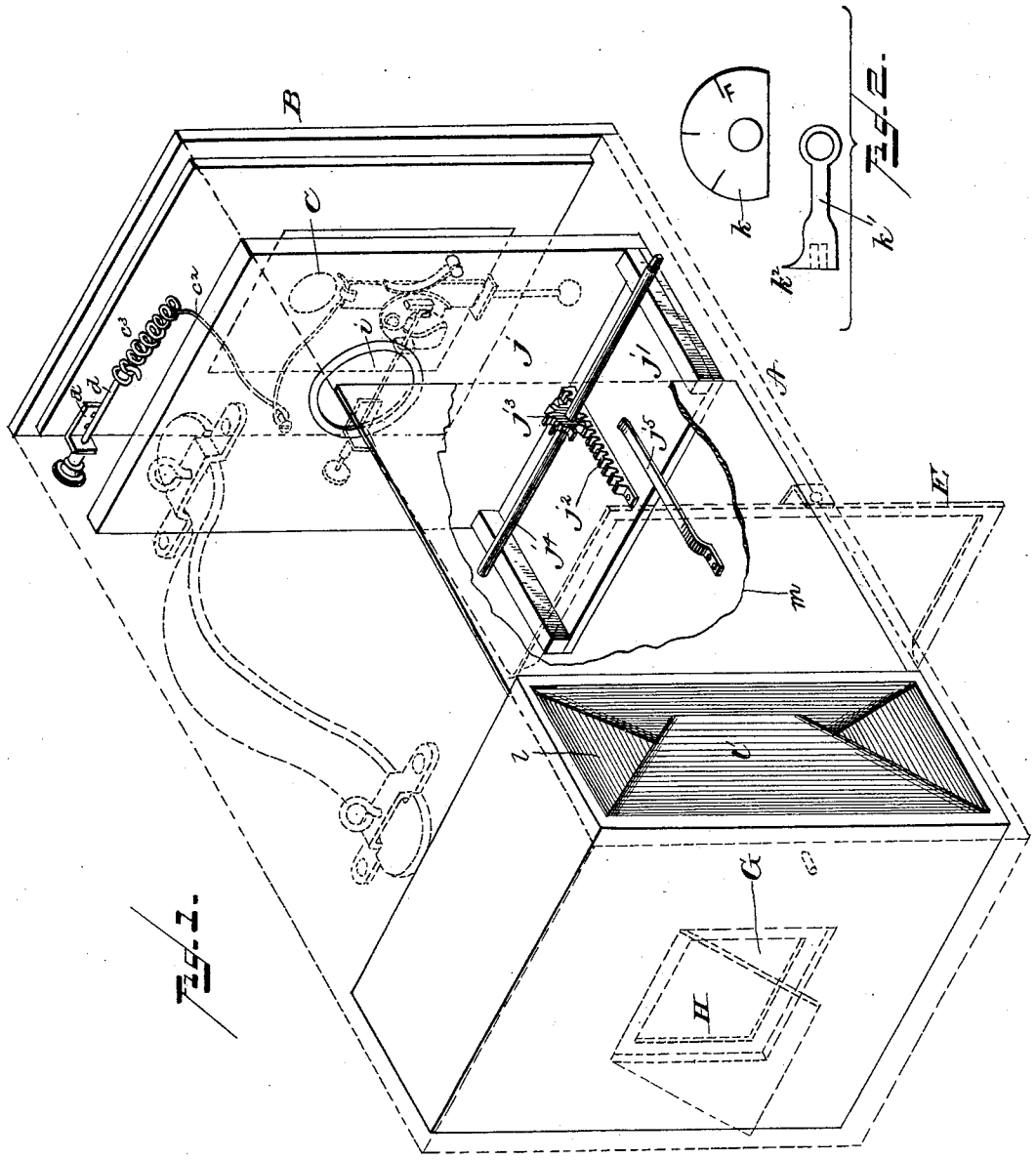


Fig. 1.

Fig. 2.

WITNESSES
F. L. Ourand.
C. A. Sinnett.

INVENTOR
William E. Schneider,
by Wm. H. Sinnett
his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

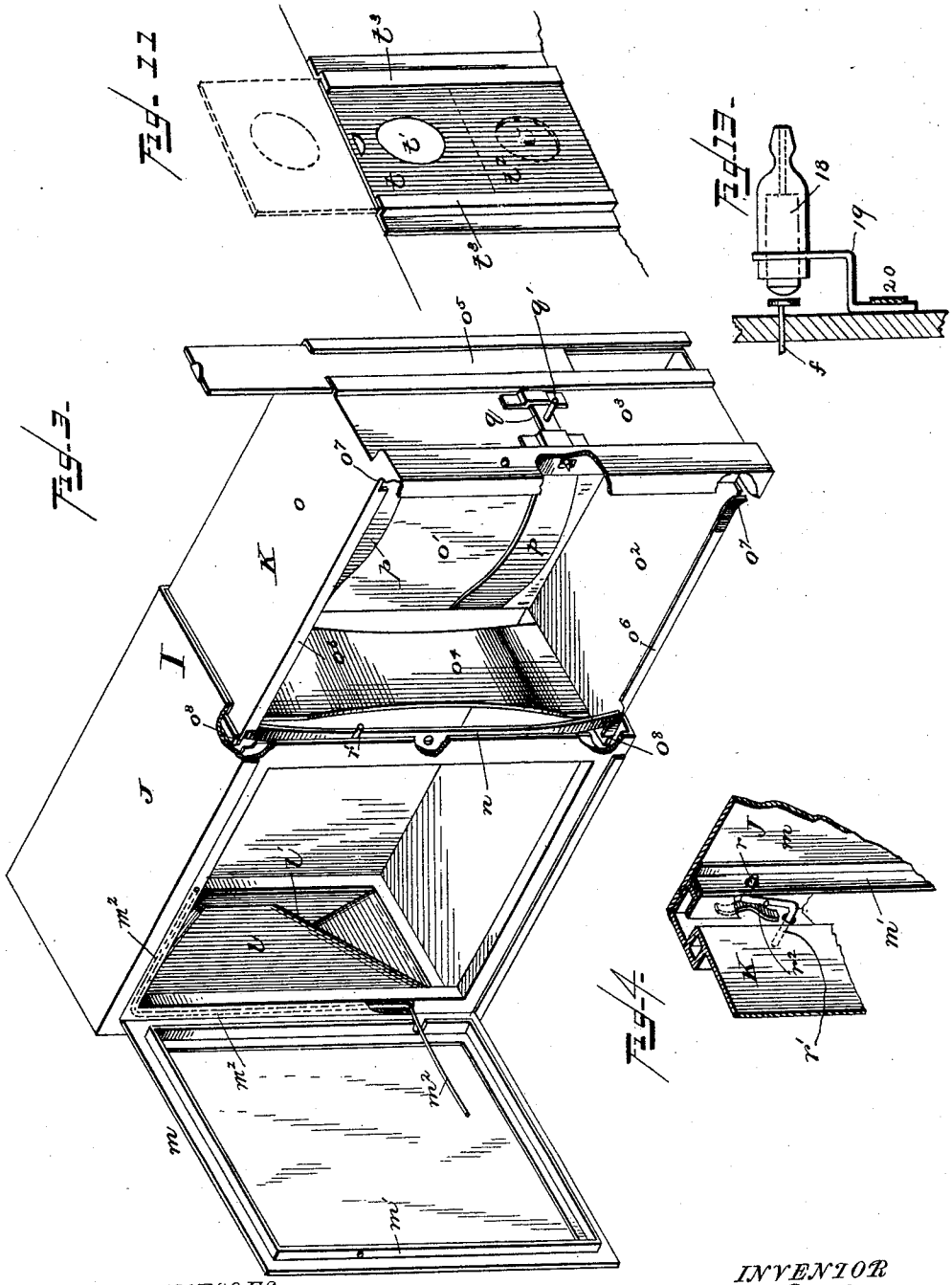
(No Model.)

4 Sheets—Sheet 2.

W. E. SCHNEIDER.

CAMERA.

No. 433,746. Patented Aug. 5, 1890.



WITNESSES

F. L. Ourand.

E. A. Finckel

INVENTOR

William E. Schneider.

by Wm. F. Finckel.

his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

W. E. SCHNEIDER.

CAMERA.

No. 433,746. Patented Aug. 5, 1890.

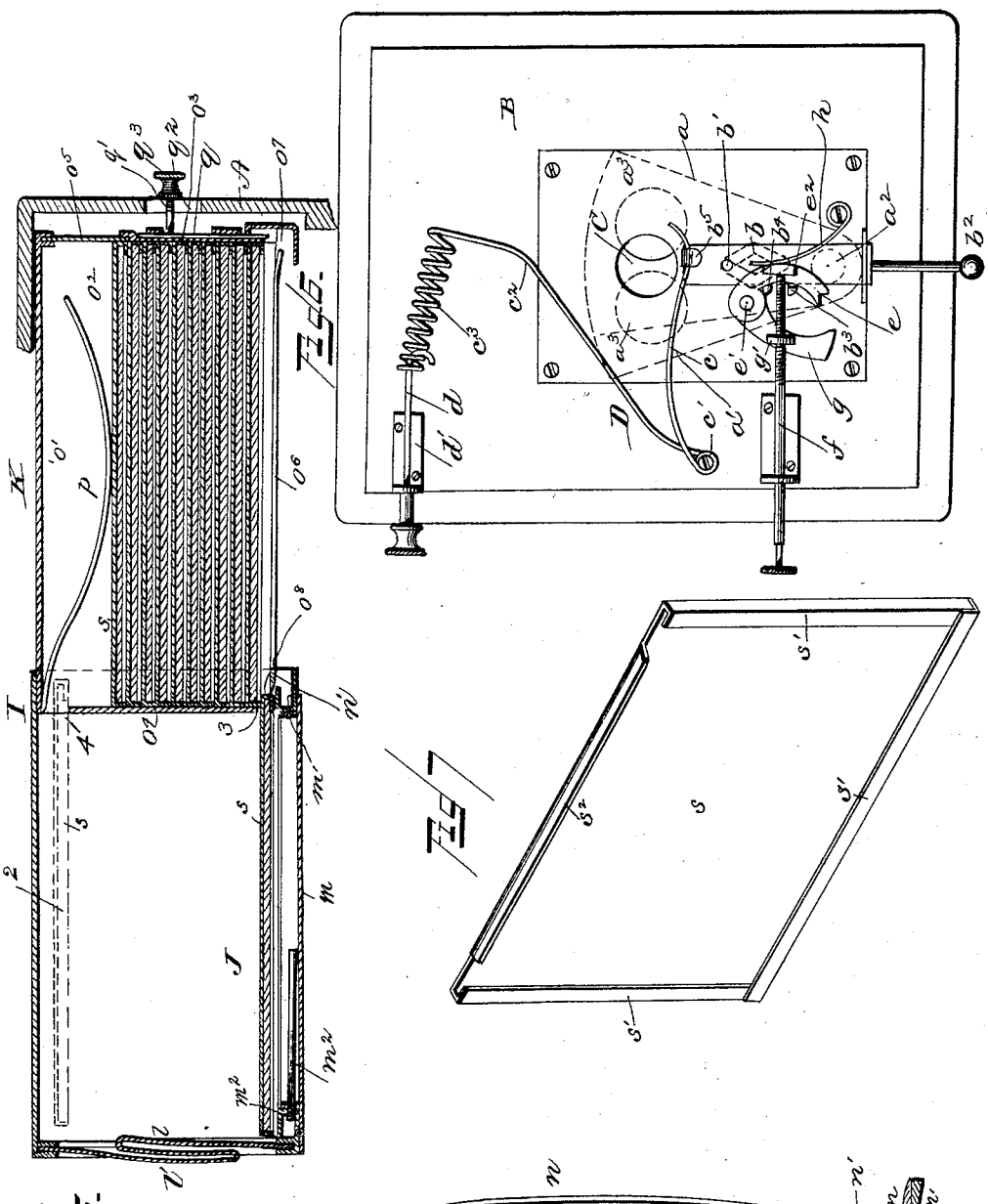


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

WITNESSES

F. L. Ousand.

E. A. Bincel.

INVENTOR

William E. Schneider.

by Wm. H. Singer.

his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 4.

W. E. SCHNEIDER.

CAMERA.

No. 433,746. Patented Aug. 5, 1890.

Fig. 8.

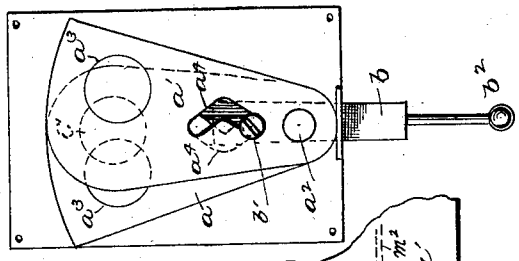


Fig. 9.

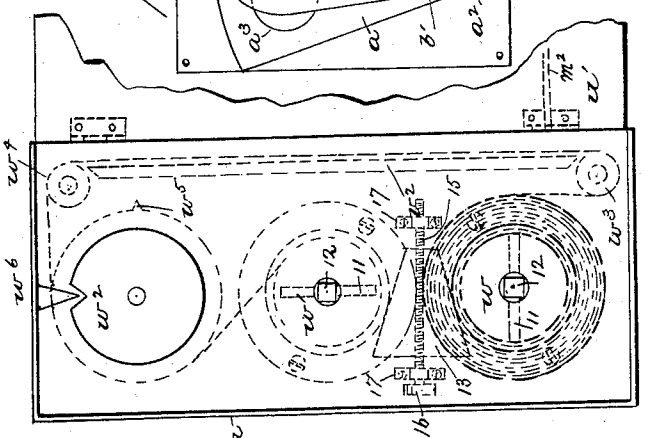
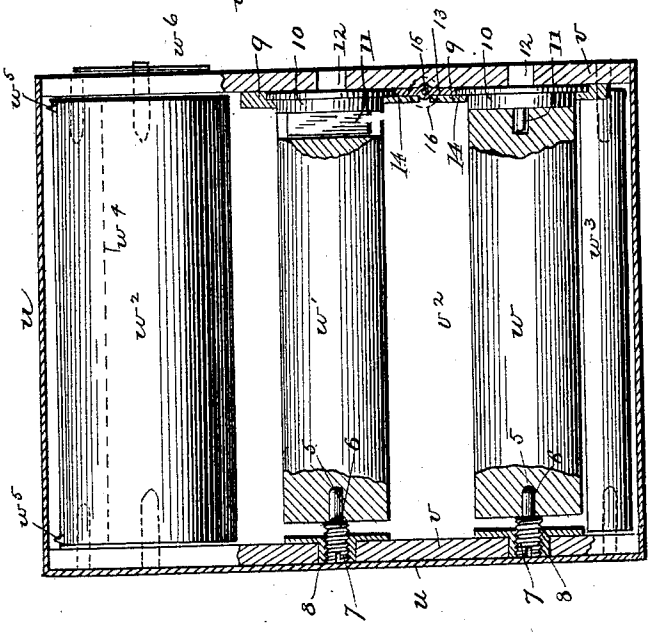


Fig. 10.



WITNESSES

F. L. Durand

E. A. Fincke

INVENTOR

William E. Schneider.

by Wm. F. Fincke

his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM E. SCHNEIDER, OF WASHINGTON, DISTRICT OF COLUMBIA.

CAMERA.

SPECIFICATION forming part of Letters Patent No. 433,746, dated August 5, 1890.

Application filed June 22, 1889. Serial No. 315,217. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. SCHNEIDER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a certain new and useful Improvement in Photographic Apparatus, of which the following is a full, clear, and exact description.

This invention relates more particularly to that class of photographic apparatus known as "detective-cameras," although the invention is otherwise applicable.

As the invention comprises many parts and many details of construction and is fully set forth in the claims, I will not preliminarily state the several features of the invention, but will proceed at once to describe an apparatus comprising the same, and then particularly point out and distinctly claim the parts, improvements, or combinations, as the case may be, which I claim as my invention.

In the accompanying drawings, in the several figures of which like parts are similarly designated, Figure 1 is a perspective view showing in outline all of the case but its front wall; Fig. 2, details to be referred to. Fig. 3 is a perspective view of the magazine detached and extended or open, with some parts broken away to expose others behind them. Fig. 4 is a perspective view of an automatic locking device for the door of the magazine. Fig. 5 is a horizontal section of a magazine with the parts extended and the door shut. Fig. 6 is an elevation of the shutters. Fig. 7 is a perspective view of a plate-carrier. Fig. 8 is an elevation of the shutters from the side opposite to that shown in Fig. 6. Fig. 9 is a front elevation of the magazine adapted to receive a roll-film. Fig. 10 is a side elevation of same with the casing in section, and in both Figs. 9 and 10 the film-holder is shown in position. Fig. 11 is a perspective view of part of the front of the casing, showing a "finder" in position. Fig. 12 is a perspective view of the ejector-spring, and Fig. 13 is a detail in elevation showing the application of a pneumatic pump to a detective-camera.

The casing A may be of approved construction, the prerequisites being portability and capacity to exclude light. The front B is provided with the aperture C, to which the shutters are applied. Any suitable shutter or shutters may be used; but I prefer to use shutters constructed as follows, (see Figs. 1, 6, and 8:) Two leaves a and a' are pivoted to a common pivot a^2, and are provided with openings a^3, which are adapted to be brought into alignment with each other and with the opening C in the front B, and are also adapted to be thrown past the said opening, so as to close it and exclude the light. These movements of the leaves are accomplished by means of a slide b, which is provided with a pin b', which engages angular slots a^4, made in the leaves, said angular slots being reversed in the two leaves. The slide b is provided with a portion b^2, projecting beyond the casing to adapt the said slide to be operated manually from outside of the casing, and thereby to operate the leaves. The slide is provided with two lugs b^3 and b^4, and is further provided with a hook or other device b^5, which is engaged by one end c of a spring D, the said spring being fastened to the front of the case at c', and being extended thence as a limb c^2, and one end of which is made as or provided with a coil c^3, which is engaged by a hook d, made fast to the case in the manner and for a purpose presently described. The spring D, through its arm c, normally retains the slide in elevated position, and hence normally operates the leaves a and a' so as to cause them to close the aperture C. For operation, either instantaneous or on time, the leaves and their slide are combined with an escapement composed of a dog e, pivoted at e' to a fixed portion, and acted upon by a screw-rod f, which, in the instance shown, abuts against a projection e^2 on the said dog. The nose of this dog engages one of the lugs on the slide for a purpose presently appearing. A second dog g is also secured to the pivot e', and is positively connected with the screw-rod f by means of a nut g', swiveled to dog g, and through which the said rod is threaded. The nose of this dog g is adapted to engage one of the lugs on the slide. A spring h bears against the dog e in order to throw it normally toward the lugs on the slide.

If instantaneous photography is to be practiced, the screw-rod f is rotated, so as to bring the dog g out of the path of movement of the lugs on the slide, and then the slide is pulled

down until the dog e engages the lug b^4. In this position the opening will be closed; and now if the rod f be moved longitudinally it will act upon the portion e^2 of the dog e and throw the said dog out of engagement with the lug b^4, and thereby permit the spring c to elevate the said slide, and in this movement the pin b' of the said slide, acting through the angular slots a^4 a^4 of the leaves, will cause said leaves to move over one another, bring their openings a^3 a^3 into alignment with each other and with the opening C in the front B of the casing, thus making an exposure and further causing the openings a^3 to recede from alignment with each other and with the opening C and close the said opening. The rapidity of movement of the slide will be commensurate with the tension of the spring D, and in order to vary this rapidity of movement provision is made for increasing and diminishing the tension of the spring, said provision consisting of the hooked rod d, mounted to rotate in a bracket d', and which, being rotated, will travel through and draw up toward itself the spiral c^3, and thus lengthen or shorten the effective portion of the spring, and so correspondingly vary its tension. If time photography is to be practiced, then the dog g is adjusted by screw-rod f into the path of movement of the lugs, and when the rod f is pushed so as to release the dog e from the lug b^4 the dog g will at the same time be thrown into the path of movement of the lug b^3 and engage the said lug and arrest the slide at the point where the openings a^3 a^3 are in alignment with each other and with the opening C in the casing, and the rod being instantly released the spring h will throw the dog e into engagement with the lug b^3 and displace dog g, and so hold the shutters open for exposure, and when the exposure has been sufficient then by again pushing in the rod f the dog a will be disengaged from the lug b^3, and the slide being free to be pulled up by the spring c the shutters will be actuated to close the opening. As shown in the drawings, the rod f is adapted to be operated by hand; but I have found that the ordinary pneumatic apparatus may be employed for operating it, (see Fig. 13,) or an equivalent device may be employed.

The lens i is mounted in suitable manner in a frame j, extending the width and height of the box, and this frame is mounted upon a carriage j', which is provided with a toothed rack j^2, engaged by a pinion j^3 on a shaft j^4, having bearings in the casing or box. A spring j^5 co-operates with the carriage j' to hold it and the frame in position within the box. One end of the shaft j^4 is extended to or beyond the outer surface of the box and squared, and an indicator-plate k surrounds it. A key k' is adapted to fit the squared end of this shaft to rotate the said shaft, and consequently the pinion j^3 thereon, to thereby change the position of the frame, and consequently of the lens, in order to provide for photographing at different distances. I prefer to arrange the frame with its lens in a fixed position, and for this purpose I provide the indicator with a mark or symbol F, with which a mark on the shaft corresponds, and so that when the two coincide the operator may know that the lens is in a fixed position—that is to say, one which has been selected for general utility. An indicator-point k^2 may be used on the key k' to co-operate with the marks upon the indicator k, in order to enable the operator to know the extent of movement made by the rotation of the shaft and pinion.

The rear of the casing is provided with a door E for access to a chamber for the reception of the magazine, and this door is adapted to be closed light-tight, though the magazine may be fitted in the box light-tight with packing instead. A focusing-aperture G, provided with a door H, may be arranged also in the rear end of the casing.

The magazine I is composed of two sections J and K, which telescope the latter within the former. The section J is permanently closed on three sides by a rigid material and on the fourth side by a flexible material l, and has on the fifth side a hinged door m, while its sixth side is open to permit of the insertion and removal of the section K. The flexible end l is by preference composed of leather or rubber folded in upon itself, somewhat like an envelope, but in such manner that the portion l' may be moved out and in freely and carry with it the other folds, for a purpose presently appearing.

The door m is made with a rabbet m' to enter the opening made for it in the section J, and the said door is provided with a spring m^2, which normally tends to throw open the said door. This spring is shown as a torsion-spring having a free end bearing against the door and having a vertical portion extended up the casing of the section J, and its other end extended at right angles along the inside of the top of the said section J, although any other form of spring may be employed whose function is to open the door normally. The section J is provided with a spring n, made fast to it at about its center and having its ends free, and these ends are provided with hooks or catches n', (see Figs. 5 and 12,) this spring being a plate-ejector.

The section K has the closed sides o o' o^2 o^3 and the partly-closed spring side o^4. A sliding door o^5 is placed in the side o^3 to permit of the filling of the said section K with plates and the removal of the plates for developing and other purposes. Springs p are arranged next the back o' in any suitable manner and are adapted to press toward the front plate-carriers placed within the section K. The sides o and o^2 are provided with the flanges o^6 o^6, which are cut away at opposite ends o^7 o^8 to permit movements of the spring n, as will presently appear.

The sections J and K of the magazine I

are united, when the latter is within the former, by means of a sliding bolt q, and the door m is locked in closed position by means of a Z-shaped bolt r, pivoted in the frame of the section J and engaging the rabbet m' of the door m, and having its other end r' projecting outside of and beyond the casing of the section K. A spring r^2 normally holds the bolt in the position indicated in Fig. 4. Any other fastener may be used.

If the section K of the magazine be filled with plates (it is designed to hold one dozen plates) and the said section be inserted within the section J and the door be locked, then the magazine may be inserted in the box through the door E, and the said door E be then closed. As soon as the projecting end r' of the bolt r strikes against the rear wall of the casing A, then the said bolt will be withdrawn from the door m and the spring of the said door will throw it open, thereby exposing a plate in the doorway of door m in the magazine in position for operation—that is to say, for "exposure."

The magazine is locked in the casing in any suitable manner. I have shown but one means to this end—namely, the bolt q—the said bolt having a screw q' projecting from it and adapted to extend through an opening q^2 in the casing A, where the said bolt is engaged on the outside by means of a clamping-nut q^3. The said opening q^2 may be enlarged at one end, so as to provide for the passage through it of the said clamping-nut q^3 when the magazine is to be removed from or placed in the box. This opening q^2 may be made of the shape of the openings in the tail-piece of a violin used to receive the strings.

When the magazine is within the case and ready for operation, the bolt q is withdrawn from engagement with the section J of the magazine, so as to leave said section free to be pulled away from the section K. In pulling away the section J its door m is closed, as by contact with the box, to exclude the light. The ends of the spring n will have slipped through the openings o^7 of the flanges o^6 into a position along the edges of the foremost plate, so that the movement of the said section J will carry with it the said foremost plate by means of the said spring, taking the said plate out of the section K and into the section J, where, by gravity, it will fall slantwise across the said section J, and may be then caught in the hand with the flexible front l, and be moved back into the said section J, as indicated by the dotted lines designated 2 in Fig. 5. In the meantime the springs p will operate to throw forward the remaining plates in the section K, so as to present another plate in position for photographing. By pushing back the section J for another exposure the plate designated 2 is pushed back into the section K and in the rear of the unused plates, and these operations may be continued until all of the plates are exposed. The side o^4 of the section K is cut away at the point 3 in order to permit the removal of a plate from the section K into the section J after a picture has been taken, and is also cut away at the point 4 in order to permit the return of the photographed plate that has been removed back into the said section K and in the rear of the unused plates. When upon drawing out the section J the spring n arrives at the notches o^8, the hooked ends of the said spring will slip out of the said notches, and as the said section J is returned upon the section K the said ends of the said spring will travel along the front of the flanges o^6 o^6, and when the openings o^7 o^7 are reached the said ends will go behind the said flanges o^6 o^6, so as to be in alignment with the rear edge of the plate that is then foremost. The edges of the flanges o^6 o^6 at the notches o^7 o^7 may be curved outwardly to facilitate the entrance of the ends of the spring back of the flanges.

As will be observed, after the plates are once put into the section K they are wholly protected from the light—that is to say, are kept in a "dark-chamber" constantly.

When all of the plates in the magazine have been used, the magazine may be removed and a fresh one be inserted in its place, the magazine serving as a dark-chamber, as already indicated. In removing the magazine the clamping-nut q^3 is loosened and the bolt q is slipped forward so as to lock the two sections J and K together, at which time the said nut will be in the larger end of the slot q^2, and then the closed magazine may be removed from the box.

In order to isolate the several plates from each other and so prevent the light from striking through all of them at any one exposure, I provide the plates with carriers s, Fig. 7, constructed of opaque substance—such as leatherette or press-board or stiff paper or other material—said carriers being constructed as a pocket with the permanent sides s' s' s' and a movable side s^2, the said side s^2 being made movable to permit of the insertion and removal of the glasses or plates for purposes of developing.

For purposes of focusing, the magazine may be removed and a ground glass inserted in its place within the box in a plane coincident with the plane occupied by the outermost plate in the magazine when that is in position. The frame with its lens may be adjusted for different distances in this way.

The "finder" that I prefer to use consists of a glass or other plate t, having a plano-convex lens t'. The lower part of the plate is made opaque in any suitable manner, as at t^2. This plate is arranged within guides t on the inside or the outside of the front of the box and so as to be projected across the opening C. The opaque portion is adapted to cover the said opening C, while the lens t' is adapted to be drawn above the level of the top of the box for purposes of vision. The opaque portion of the plate serves as an additional safe-

guard for excluding the light when the camera is not in use.

My invention is applicable also for use in connection with films. A modified form of magazine will be used, and such magazine may consist of a rectangular box u, closed on all but one side, as shown in Figs. 9 and 10, and this box is provided with a door u', adapted to operate as in the magazine before described. The film-holder consists of boards v v' and a connecting cross-board v^2, the latter serving as a base for the film. w is a spool upon which the film is wound. w' is a reel which receives the film after use, and w^2 is a measuring-roller. The film passes over spool w, around a guide-roller w^3, thence across the board v^2, and thence over another guide-roller w^4, and thence about the measuring-roller w^2 to the reel w'. The measuring-roller is of a circumference equal to the length of the film exposed, and it is provided with one or more points or prickers w^5, which indent the film so as to guide the operator in separating the said film in the dark-room. An indicator w^6 is used to advise the operator when sufficient film has been unwound for a new exposure.

The roller w^2 may be permanently fixed in the frame; but the spool w and reel w' are necessarily made removable. Any suitable bearings may be provided for purposes of removal of the said spool and reel. I have shown the said spool and reel provided with sockets 5, which receive the unthreaded ends 6 of screws 7, the said screws being tapped in fixed nuts 8, arranged in the portion v of the frame. At the other ends plates 9 are secured to the board v', and these plates are socketed to receive bearing-pieces 10, which are provided with ribs 11, which enter kerfs in the ends of the reel and spool, respectively. By removing the screws 7 the reel and spool may be moved toward the board v and clear the ribs 11 on bearing-pieces 10, and so the said reel and spool may be removed.

The bearing-pieces 10 of the reel and spool are provided with squared ends 12, to which a key may be applied for rotating them. The film may be secured to the reel and spool by means of a groove and spline, such as are used sometimes in securing shades to their rollers, although any other clamping device may be employed. Any suitable friction device and device for preventing retrograde movement of the spool and reel may be employed where necessary. Such a friction device may consist of a wedge-shaped, by preference, piece of rubber or other substance 13, arranged in sockets 14, made in the plates 9, in such manner that the edges of the said piece 13 shall bear against the rims of the bearing-pieces 10. The friction-piece 13 is mounted upon a screw-rod 15, having a head 16 to rotate it to adjust the friction-piece so as to apply more or less friction. The rod 15 is supported in brackets 17 on the board v'.

The door u' may be provided with an automatic latch or bolt, such as is used on the magazine before described.

If desired, a cover may be provided for the opening of the magazine u; but ordinarily the end v' of the frame will be made to fit the said magazine light-tight.

It will be understood that the roll-film holder is bodily removable from the magazine.

The partition or side o^4 of the section K is made as a spring with a slight bulge into the section J, so as to aid the returning plates in clearing it.

As shown in Fig. 13, the rod f may be operated by a pneumatic pump 18 of usual construction and arranged in alignment with said rod, but not united to it. Such a pneumatic pump may be furnished as an attachment for detective-cameras by mounting it upon a bracket 19, which may be secured to the camera by means of a socket 20, attached to the box and adapted to receive the bracket 19. This provision of a readily-applicable auxiliary and automatic shutter-operator possesses many advantages, which will be manifest upon suggestion.

With reference to the flexible front l, I desire it to be noted that it is an unbroken front without openings, and the plates are manipulated by catching them between the thumb and fingers with the material of the front l interposed, thus differing from those flexible fronts which have an elastic opening in them, through which the hand is passed, and which gather closely about the wrist or hand.

I do not wish to be understood as limiting my invention to the mere details of construction hereinbefore set forth.

What I claim is—

1. A magazine having a section adapted to receive a number of plates, and another section movable upon the first-named section and provided with an ejector and a flexible front to enable an operator to take an exposed plate from the front of the first-named section and place it in the back thereof, substantially as described.

2. A magazine having telescoping sections, one of which is adapted to contain a number of plates, and the other of which is adapted to be moved away from and toward the first-named section, and provided with an ejector and a flexible front to enable an operator to take from the front of the first-named section a plate and place the said plate within the said first-named section and in the rear of the other plates therein, substantially as described.

3. A magazine composed of telescoping sections communicating with each other at front and rear only, one section adapted to contain a number of plates and the other adapted to be moved in front of the first-named section to remove the plates one by one from it and correspondingly replace them, and having a flexible opaque outer surface to permit the manipulation of the plates as they are taken

one by one from the first-named section to the last-named section and replaced in the first-named section, substantially as described.

4. A magazine which is at the same time a dark-chamber, provided with an automatically-operated door, opening as the magazine is inserted in the camera and closing as it is removed, substantially as described.

5. A telescopic magazine provided with a bolt *q* for locking the sections of the magazine together and for retaining it within the camera casing or box, substantially as described.

6. A magazine provided with a door, combined with a latch or bolt adapted to engage and lock the door, and projecting beyond the magazine and adapted to be acted upon by contact with the casing or box to unlock the said door, substantially as described.

7. A telescopic magazine having a section adapted to be filled with plates and provided with springs to press forward the said plates and keep the foremost plate in position for use, and a movable section having an ejector and a flexible front, substantially as described.

8. In a camera, the combination, with the casing and the front therefor having a light-opening, of a movable frame containing a lens and arranged within the casing, a carriage upon which the said frame is mounted rigidly, a toothed rack arranged upon the said carriage, a pinion meshing with the said rack, and a shaft passed transversely through the casing and bearing the pinion and adapted to rotate the pinion to thereby adjust the carriage and the lens-frame, substantially as and for the purpose described.

9. A plate-carrier constructed as an integer of opaque substance and provided with three fixed pocketed edges and one movable folding-flap edge, substantially as described.

10. The shutters and means to move them, substantially as described, combined with a tension-spring terminating in a coil, and a hook adapted to be adjusted within said coil to vary the tension of the spring, substantially as described.

11. A finder composed of a sliding plate arranged over the exposing tube or opening and having a lens, substantially as described.

12. A magazine composed of telescoping sections, one of which is adapted to receive a number of plates and having plate-retaining flanges whose opposite ends are notched, and the other provided with an ejector to engage the front plate and remove it from the first section, substantially as described.

13. A magazine having telescopic sections, one of which is adapted to contain a number of plates, and the other of which is adapted by movement away from and toward the first-named section to take from the front thereof a plate and place the said plate within the said first-named section and in the rear of the other plates therein, and a spring-plate or side dividing the two sections, substantially as described.

14. The shutters and an escapement therefor, comprising two dogs, an adjusting and operating screw-rod, and a swiveled nut on one of said dogs through which the rod passes, substantially as described.

In testimony whereof I have hereunto set my hand this 22d day of June, A. D. 1889.

WILLIAM E. SCHNEIDER.

Witnesses:

PHILIP F. LARNER,

HARRY Y. DAVIS.