

No. 662,696.

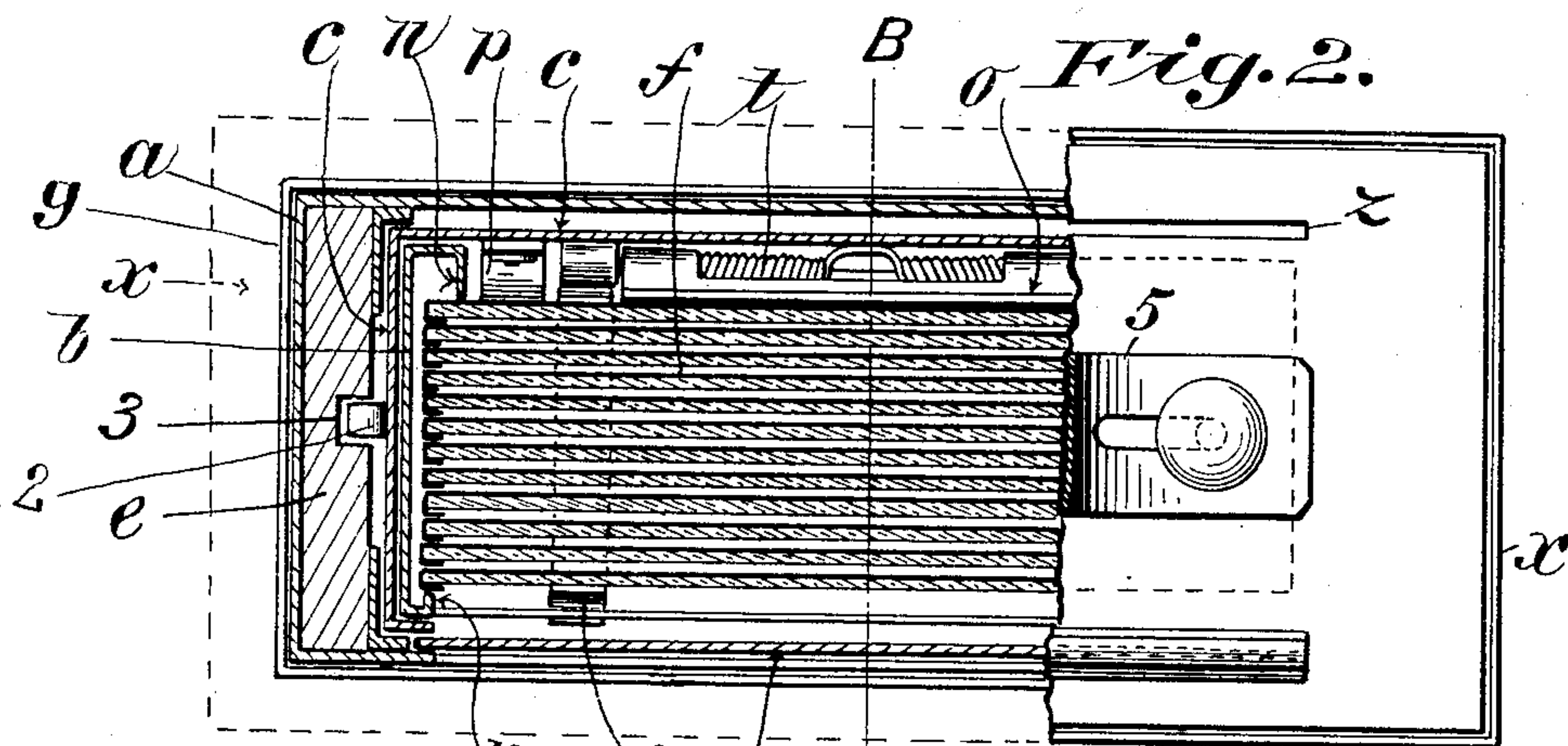
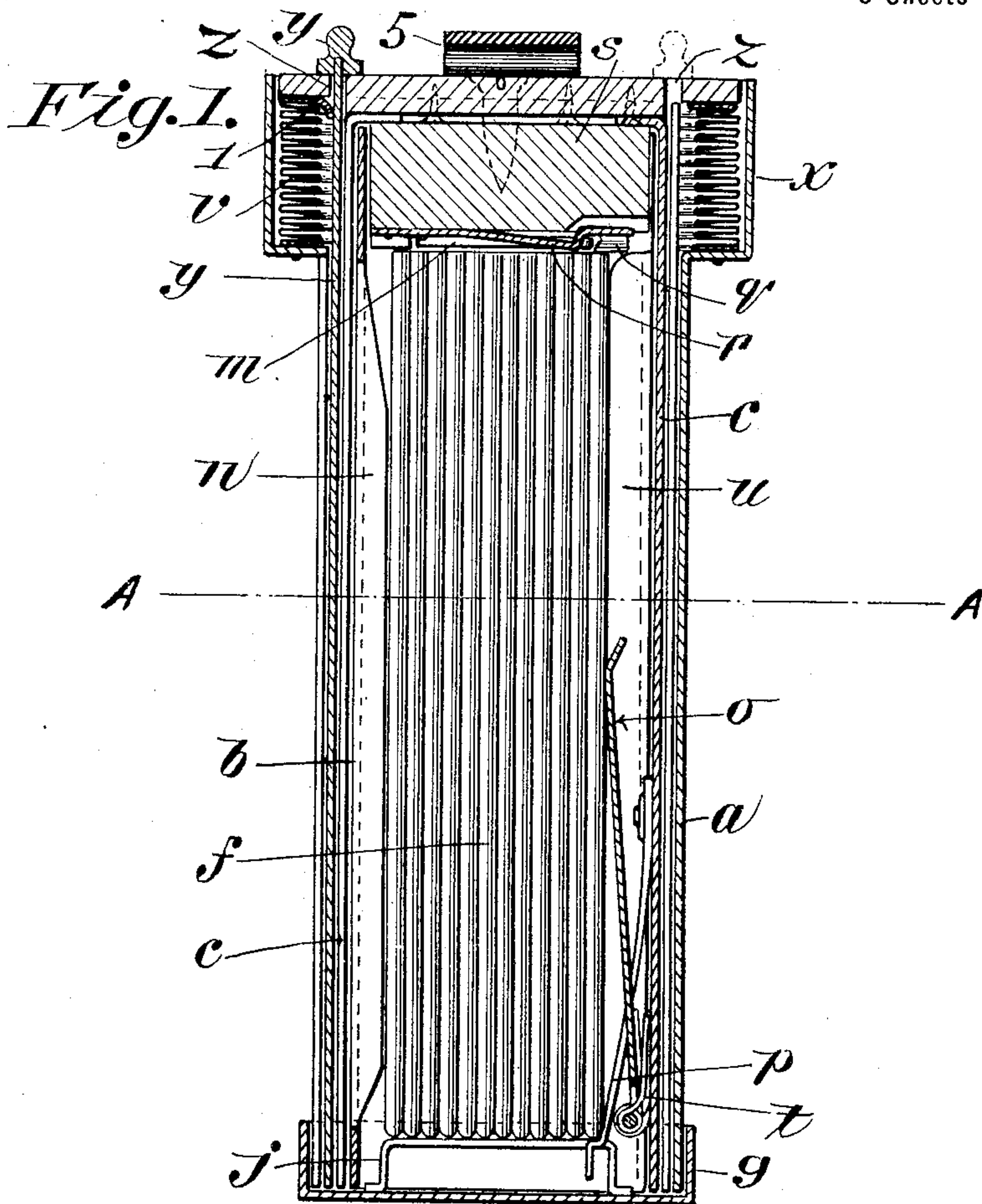
Patented Nov. 27, 1900.

C. H. PRATT & A. D. COPELAND.  
PLATE MAGAZINE FOR CAMERAS.

(Application filed Apr. 2, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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Attorneys.

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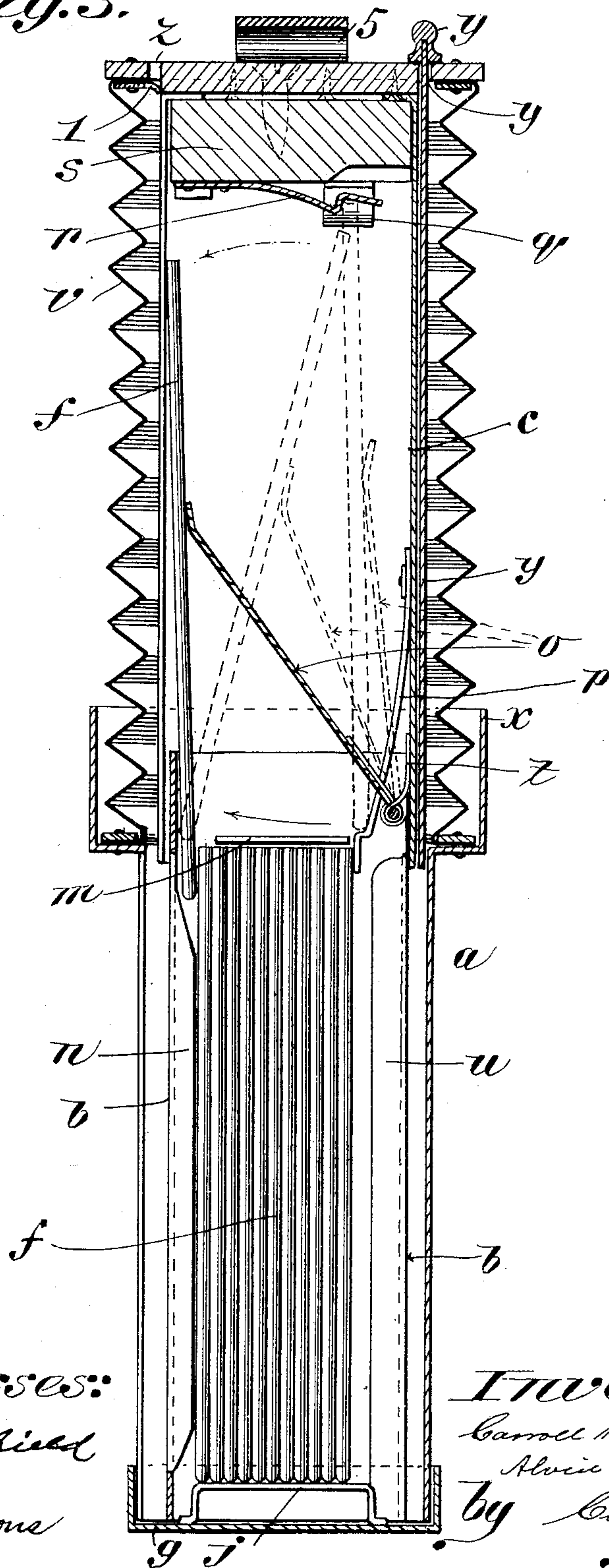
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*Fig. 3.*



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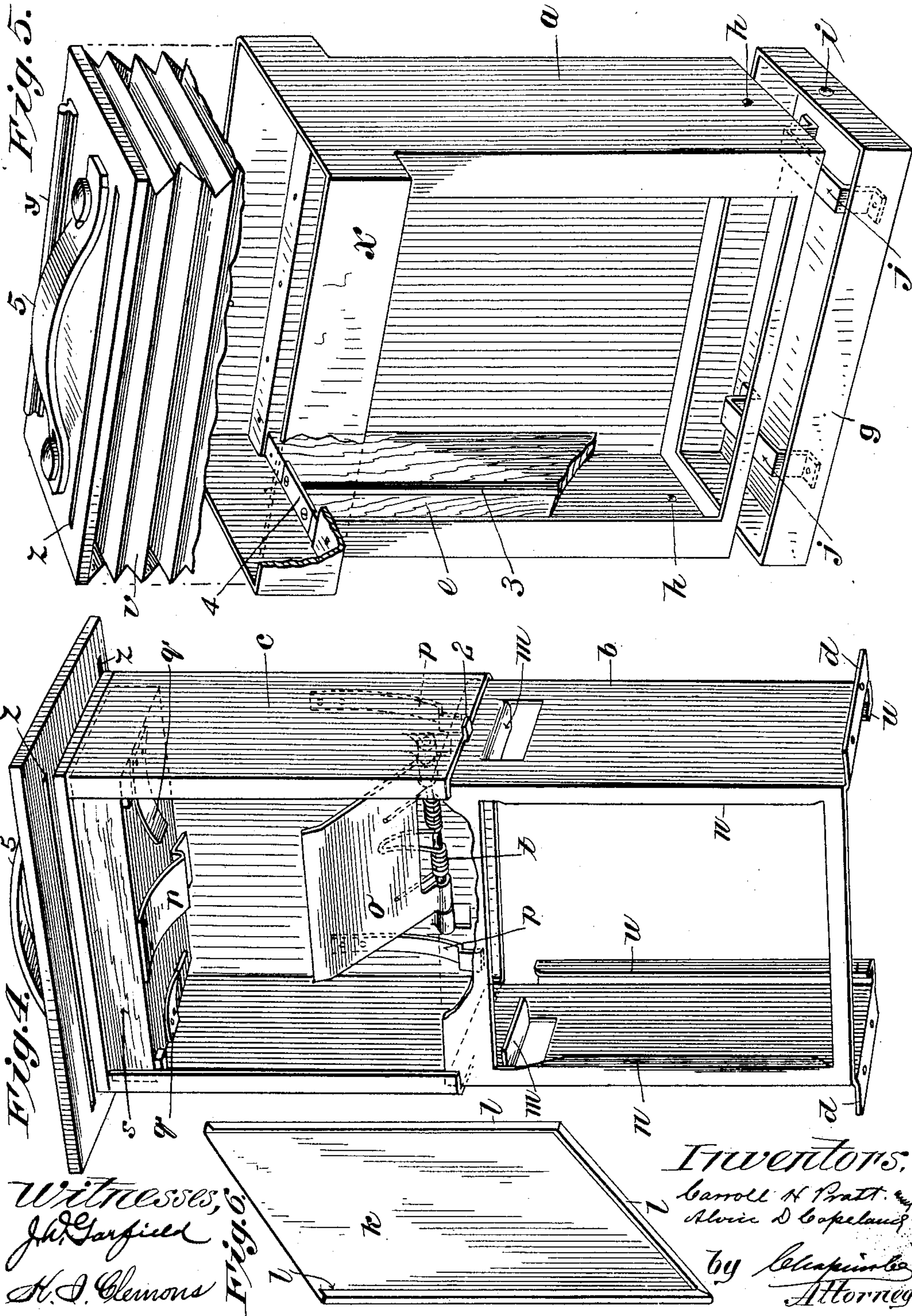
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3 Sheets—Sheet 3.



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



# UNITED STATES PATENT OFFICE.

CARROLL H. PRATT AND ALVIN D. COPELAND, OF SPRINGFIELD,  
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## PLATE-MAGAZINE FOR CAMERAS.

SPECIFICATION forming part of Letters Patent No. 662,696, dated November 27, 1900.

Application filed April 2, 1900. Serial No. 11,152. (No model.)

*To all whom it may concern:*

Be it known that we, CARROLL H. PRATT and ALVIN D. COPELAND, citizens of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Plate-Magazines for Cameras, of which the following is a specification.

This invention relates to plate-magazines for cameras, one object of the invention being to provide a magazine of this class whereby one plate from a number standing on edge in the magazine may be taken by positive movements and carried from the rear side of the bunch to the front thereof and placed in position for exposure by simple and effective means without liability of scratching or marring in any way the sensitized side of the plate.

A further object of the invention is to construct a magazine adapted to be attached to cameras of various makes as a plate-holder would be attached and capable of operation whether the plates therein be in a vertical or horizontal position or inclined to either the vertical or horizontal position.

The invention consists in the construction set forth in the following specification and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a vertical sectional view of the magazine constructed according to this invention, said section being taken substantially on line B B, Fig. 2, the plates being shown in end elevation. Fig. 2 is a sectional plan view taken on line A A, Fig. 1. Fig. 3 is a view similar to Fig. 1, but showing the plate-moving devices in the position they would assume in transferring a plate from one side of the bunch of plates in the magazine to the other. Fig. 4 is a perspective view of parts of the magazine removed from the outer casing thereof, the protective curtain inclosing the vertically-sliding member being removed. Fig. 5 is a perspective view of the outer case of the magazine, showing a portion of the protective curtain which fits into the top thereof separated from said case and showing the bottom of said case also separated from the body thereof. Fig. 6 is a perspective view of a sheet-metal frame into which each plate is fitted.

Referring to the drawings, this magazine consists, essentially, of a case *a*, (shown in Fig. 5,) in which is secured a plate-holding case *b*, Fig. 4, which when in position within the outer case leaves a space between the inner walls of the outer case and the outer walls of the plate-holding case, which receives the slide-box *c*, the latter inclosing three sides of and sliding on the plate-holding case *b*. The front side of the case *a*—that is, the side next to the lens of a camera to which the magazine may be attached—is left open, as shown in Fig. 5, and the front side of the slide-box *c* is provided with a similar opening. Both the front and rear sides of the plate-holding case *b* are open, and all of the openings in said members are of substantially the same area and register one with the other when the parts are in the position shown in Fig. 1.

The plate-holding case *b*, as stated, is secured to the outer case *a* along the bottom of the latter in any suitable way—as, for example, in the manner shown in the drawings—by turning outward the lower ends *d* of the sides of the plate-holding case *b* and screwing or nailing them to the lower edges of wood strips *e e*, which are secured to the inner surface of the two opposite side walls of the outer case *a*.

The open lower end of the case *a*, through which the plates are introduced into the magazine, is temporarily closed after the introduction of said plates, which are indicated by *f*, by a shallow box-like bottom *g*. This is removably secured to said case in the position shown in Figs. 1 and 3 in any convenient manner. In Fig. 5 of the drawings means for holding said bottom on the case are shown consisting of a projection *h* on said case, over which a depression *i* in the end wall of the bottom snaps when the bottom is forced onto the end of the case. The said bottom *g* supports the weight of the plates, which latter rest on two transverse supports *j* on said bottom *g*, each plate being inserted in a metal frame *k*. (See Fig. 6.) It will be observed that these supports *j* are so located that the edges of the plates overhang said supports. This is for the purpose of allowing devices, to be described, to engage the bottom edge of the rearmost plate near the corner of the latter to slide it up back of the other plates prepara-



tory to its movement to the front side of said bunch into position for exposure. The latter covers the back side of the plate, and its edges *l* are bent over to receive three sides of the latter, one side being left open and the plate being slipped into the frame from that side thereof. The bent-over edges of the frame *k* serve to separate the plates one from the other, as shown in Fig. 2, whereby their sensitized surfaces are kept out of contact with the back of the frame *k* adjacent to them.

The plates have but little play laterally within the plate-holding case *b*, the latter being made just wide enough to permit their easy introduction therein. To restrain them against vertical movement when the camera is tipped up and to provide a stop for them against which they may come to a bearing when they are introduced into the magazine, which must be done with the latter held in a reversed position, two lips *m* are provided which project from each side of the case *b* toward the center, as shown in Figs. 1, 3, and 4. These lips are not of sufficient width to extend transversely across the ends of all the plates, for there must always be room for a plate to be withdrawn from the rear side of the bunch of plates upwardly and after being carried over the top to the front of the bunch forced down into exposure position, and in being withdrawn from the rear side and replaced on the front of the plates in the camera a plate passes by each end of said lips. However, said front and rear plates of the bunch are so held against the plates between them which lie under the lips *m* that they are prevented from sliding by the said lips when the magazine is held in a reversed position and the slide-box is then operated. This is accomplished by providing abutments *n* for each of the two vertical sides of the front plate, against which the bent-over edges *l* of the frame *k* bear, as best shown in Fig. 2. These abutments are preferably made, as shown in the drawings, by bending back a strip of the metal of which the plate-holding case *b* is made, which strip may be left for that purpose when the opening is cut through the front of said case, as stated. The upper portions of said abutments *n* are inclined from the edge of said opening back toward the edge of the abutments to provide means whereby a plate which may be forced down in front of the plates in the magazine may force said plates backward. Said plates are normally forced toward said abutments *n* by a spring-actuated wing *o*, pivotally hung on the rear side of the slide-box *c*. Fig. 3 shows this most clearly, and when said slide-box is in the position shown in Fig. 1 the upper end of said wing bears against the rearmost plate of those in the magazine, at about the center thereof. Two downhanging plate-lifting hooks *p p* are secured to the rear wall of the slide-box, as shown, and are adapted to engage the lower edge of the rearmost plate and raise it to the position shown in dotted

lines in Fig. 3 far enough to permit the lower edge of the plate to pass over the top of the lips *m* to the position shown by the plate in full lines in said figure, the course of the plate being indicated by the arrows. The said hooks *p* are of spring metal and so shaped as to be adapted to exert a spring action against the bunch of plates, and their location is such that they are always pressing against the rearmost plate whatever may be the position of the slide-box *c*. Therefore whenever the latter is pushed down to force a plate down into position for exposure said plate as it comes against the others at the base of the inclined part of the abutments *n* must force the said plates back against the tension of the hooks *p* and the spring-actuated wing *o*, and as the slide-box descends the ends of the hooks *p* slide down the side of the rearmost plate near the edge thereof, and when the slide-box reaches its lowest position said hooks snap under the edge of the plate ready to carry it upward when the slide-box is next drawn out. Just before the slide-box reaches the limit of its downward movement the springs *q q* and *r*, secured in the upper end of the slide-box to the under side of the block *s*, will come to a bearing on the upper edge of the rearmost plate, and the continued movement of said slide-box will cause the compression of these springs, and when the hooks *p* finally snap under the edge of the rearmost plate the latter will be firmly held by its upper and lower edges and may thus be carried upward. Meanwhile the spring-wing *o* will be bearing against the back of said plate in a direction designed to force it out from between the springs which bear on its upper and lower edges, and as soon as the lower edge of the plate passes above the lips *m* the force of the spring *l*, which actuates the wing *o*, will push said plate toward the front side of the slide-box. The spring *r*, having a hook thereon which engages the front side of the plate, will resist the action of the spring *l* of the wing *o*, and hence the lower edge of the plates will leave the hooks *p* first, giving the plate an inclined position relative to the front and rear sides of the box; but, as stated, the springs *q q* and *r* being under compression react as soon as the plate becomes disengaged from the hooks *p* and tend to impart an endwise motion thereto as the plate is thrown over against the front of the box, and the resultant effect of this combined endwise and transverse movement is to drop the lower edge thereof down into the space between the front of the upper edge of the front plate, as shown in full lines in Fig. 3, the spring-wing *o* holding it against the front of the slide-box and covering the opening therein, the sides of the plate and the bottom thereof bearing against the sides and bottom of the opening.

When a plate is forced down in front of the bunch, as below stated, from the positions shown in Fig. 3, it crowds the remaining plates backward, and suitable abutments against



which said plates may bring up are provided, turning inward strips of metal on the sides of the open back thereof, thus forming the abutments *u u*, which are in all respects substantially the same as the abutments *n*. When the slide-box reaches the position shown in Fig. 1, the pressure of the spring-actuated wing *o* and of the plate-lifting hooks *p* will force the bunch of plates in the magazine toward the front thereof against the abutments *n*, they then being accurately held in the focal plane. The abutments *u u* provide a space between the plates and the sliding box, within which the sliding wing *o* and the lifting-hooks *p p* slide.

Means for protecting the plate that is being transferred from the rear to the front of the bunch of plates from the light are provided by the flexible curtain *v*. This is made of any suitable opaque flexible material in the form of a rectangular tube, one end of which is attached to the under side of the overhanging edge of the top of the slide-box and the opposite end similarly attached within the enlarged top *x* of the outer case *a*. Said enlargement *x* of the outer case *a* is, like said case, of rectangular shape and is adapted to receive the said curtain *v* when the slide-box *c* is in the position shown in Fig. 1, said curtain being provided with bellows folds, as shown in that figure and in Fig. 3. Said curtain is made of such dimensions as will leave a sufficient space between it and the front and rear sides of the slide-box to permit the free entrance of a slide *y*, which is used to cover the opening in the front of said slide-box and which when the latter is pushed down into the case *a* will likewise cover the opening in the front of the plate-holding case.

When the slide-box is drawn up, as in Fig. 3, to effect the transfer of a plate, said slide *y* protects the plate in said box from the light, and the magazine during this operation being of course attached to the camera the front plate therein will be protected from the light by reason of its position on said camera. Two slits *z* are made through the top of the slide-box, as shown, to receive said slide *y*, the one at the rear of the box being merely to hold it when it is withdrawn from the slit in front, said slide only coming in front to protect the plates when the magazine is detached from the camera. Light is excluded from said front slit when the slide is withdrawn therefrom by a strip *1* of some flexible material (see Fig. 1) applied in the manner usual in constructions of this class in such manner as to cover the said slit when the slide is pulled out of it.

To prevent the slide-box *c* from being drawn upward beyond the point necessary to permit the transfer of a plate carried therein from the rear to the front of the bunch of plates, lugs *2* on the lower edge of the sides of said box are provided, which travel in vertical grooves *3* in the wood strips *e*, the upper ends of which are closed, as by the plates *4*, with

which said lugs *2* come in contact when the slide-box reaches its uppermost position.

When the slide-box *c* is pushed down to the position shown in Fig. 1, the under side of the blocks *s* in the top thereof lies close to the upper side of the lips *m* and the upper ends of the plates *f*. Therefore if the front plate of the bunch should move endwise when the magazine is reversed its movement would be arrested by engagement with the stop-block *w*.

To load the magazine, it is held in reversed position in one hand and the bottom *g* is removed. The plates may then be inserted in a bunch or singly, as desired, and the bottom piece *g* put back in place.

To operate the magazine to transfer a plate from the rear of the bunch in the magazine to the front thereof in position for exposure, the slide-box is pulled up by means of a strap until it comes to a stop and is then pushed down again. The said upward movement raises the rearmost of the plates *f*, as described, far enough to permit the wing *o* to push the plate over to the front of the box, as seen in Fig. 3, and the descending movement of the slide-box pushes the plate down into position for exposure by the block *s* in the top of the slide-box striking against the top of said plate.

It is seen from the preceding description of this construction that all of the plate-transferring movements are positive, and hence it is practicable to effect the transfer of a plate in whatever position a camera may be placed in. Another advantage of this construction is that it is adapted to be attached to many different cameras by removing the plate-holder and applying the magazine in its place, where it may be secured in any suitable way.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a camera-magazine, a plate-holding case, a series of plate-frames therein, a slide-box having a telescopic movement relative to said plate, one or more hooks on said slide-box for engaging the lower edge of one of said frames, and one or more spring-hooks thereon for engaging the upper edge of said frame, the latter being held between said hooks; a spring-plate hinged on the slide-box behind said plate whereby when the latter, by the movement of the box, is raised above said series of frames, the free end of said spring-plate may force the lower end of said plate-frame, held between said hooks, over the top of said series of frames in advance of the upper end of the frame, and into position to be pushed down on the opposite side of said series of frames by another movement of the slide-box, substantially as described.

2. In a camera-magazine, a plate-holding case, a series of plate-frames therein, a slide-box having an in-and-out movement relative to said plate-holding case, spring-hooks on said box adapted to snap over the upper and



lower edges of one of said frames upon the inward movement of said box, from opposite sides of said frame, a spring-plate on said box adapted to force the lower end of said frame over the top of the other frames, at the end of the outward movement of said box, in advance of the opposite end of the frame, whereby upon the succeeding inward movement of the box said frame may be carried downward on the opposite side of said series of frames, substantially as described.

3. A magazine for cameras comprising an outer case having an opening in one side thereof, a plate-holding case rigidly secured within said outer case and having two open opposite sides, a slide-box having one open side and adapted to move vertically between said outer case and the plate-holding case, and on the latter, all of said openings being in registering position when a plate is in position for exposure; an opaque tubular curtain inclosing said slide-box and attached by its opposite ends to the latter and to the outer case, and a slide adapted to be interposed between said curtain and the wall of said slide-box,

whereby the opening in the wall of the plate-holding case may be closed, substantially as described.

4. A magazine for cameras, comprising an outer case, a plate-holding case rigidly secured within the outer case, a slide-box adapted to move vertically between the outer case and said plate-holding case, a tubular protecting-curtain attached by one end to the end of the slide-box, and by its opposite end to the said outer case, whereby, when said slide-box is moved vertically out of said outer case, it will be entirely inclosed by said curtain, combined with means positively operated by the movement of said slide-box for moving a plate from one side of a series of plates in said plate-holding case upward and over the top of said series, and down on the other side thereof, substantially as described.

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