

No. 622,402.

Patented Apr. 4, 1899.

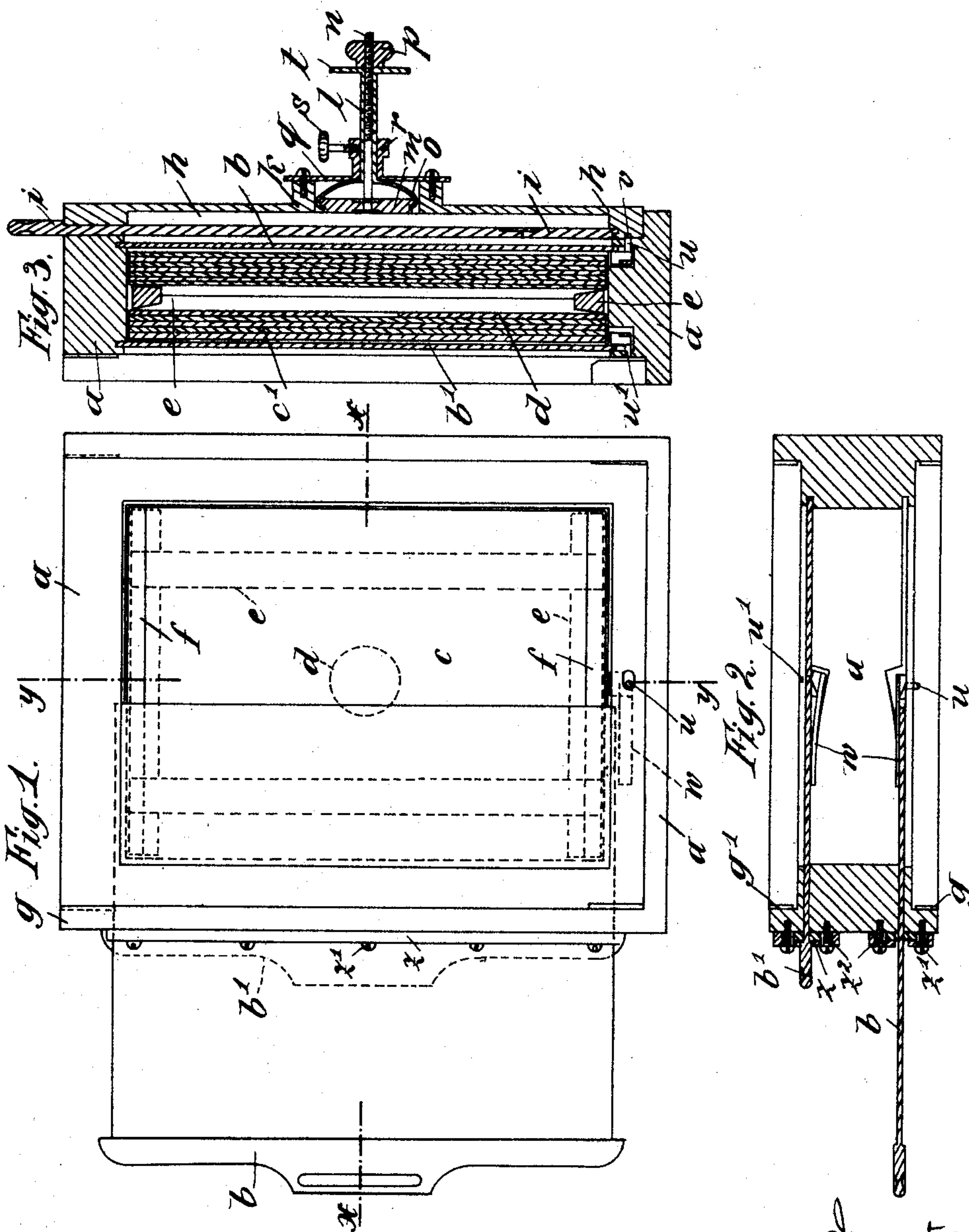
J. STARK.

PHOTOGRAPHIC PLATE CHANGING APPARATUS.

(Application filed Apr. 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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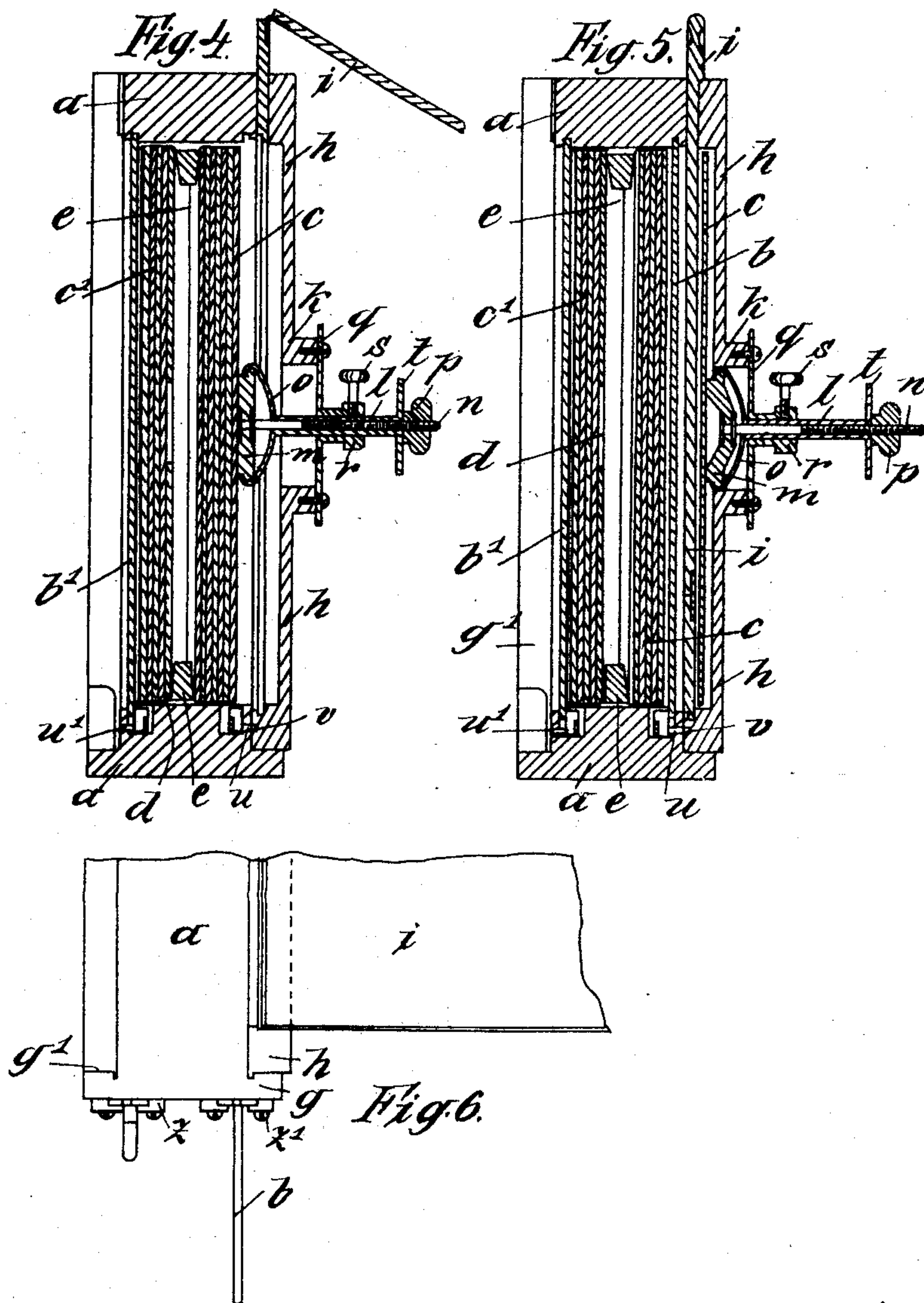
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UNITED STATES PATENT OFFICE.

JOSEF STARK, OF NEUBURG, GERMANY.

PHOTOGRAPHIC-PLATE-CHANGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 622,402, dated April 4, 1899.

Application filed April 16, 1898. Serial No. 677,873. (No model.)

To all whom it may concern:

Be it known that I, JOSEF STARK, captain in the German army, and a resident of Neuburg, Bavaria, Germany, have invented certain new and useful Improvements in Apparatus for Changing Photographic Plates in Full Daylight, of which the following is a specification.

This invention relates to an apparatus which enables the photographer to change the sensitive plates in full daylight, and which consists, essentially, of a plate-box provided with slides on its upper and lower sides and of a plate-holder to be introduced into the photographic camera and provided with a plate-shifter, by means of which the plates are taken from the box and transported into the plate-holder, and vice versa.

The apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the box without the plate-holder, the upper side being semi-opened; Fig. 2, a section on the line xx of Fig. 1; Fig. 3, a section on the line yy of Fig. 1, the plate-holder being in position; Fig. 4, the same section, the slides of box and plate-holder being open; Fig. 5, a similar longitudinal section through box and plate-holder, a plate having been transported from the box to the plate-holder; Fig. 6, a partial edge view of Fig. 4.

The box a , which serves as a receptacle for the plates, is provided on its upper and lower sides with slides b b' . To separate the fresh plates from those already used, a plate of pasteboard provided with a perforation in its center is arranged in the box and put between the fresh plates and the plates already used. The box must always be entirely filled, and if there are not enough plates or if the box is not to be entirely filled for the purpose of diminishing the weight of it light frames e , of wood or felt, are used to replace the plates.

Of course the filling of the box is executed in a dark room. The number of plates which can be put into the box depends upon the depth of the box. To protect the plates from being damaged one by the other, small paper strips f are pasted to the back sides of the plates along their borders.

The upper and lower sides of the box are provided with undercut guides g g' for the

plate-holder, which is provided with flanges to slide in under said guides, as shown best in Fig. 6. The plate-holder is closed tightly by a slide i . In its back is an opening h' , surrounded by a flange k , to which is attached the plate-shifter. This is preferably a pneumatic device for seizing a plate and transferring it from the box to the holder, and vice versa. It is preferably constructed as follows: On the flange k is fastened a plate q , covering the opening h' and having a central tubular neck r . A sleeve l , provided with a flange t at one end, is arranged to slide in this neck and can be adjustably secured therein by a set-screw s . The inner end of the sleeve is expanded to form a cup o , which embraces the periphery of a rubber disk m . To the center of this disk is fastened a rod n , which passes out through the sleeve l and has a nut p on its screw-threaded outer end bearing against the flange t . By turning the nut the rubber plate m is raised in its center, while its edge is pressed toward the uppermost photographic plate, so that a vacuum is formed between the rubber plate and the photographic plate, whereby a firm adhering of the photographic plate to the plate-shifter is obtained.

In order that no light may penetrate into the box, the guides of the slides b b' are provided with ledges z , lined with cloth or any other suitable material and fixed to the box by means of screws z' .

In the frame of the box are suitable recesses to receive springs w , on which are pins u u' , adapted to catch into notches v in the plate-holder. The object of these pins is to prevent the plate-holder from being taken off before the corresponding slide of the box is closed, which would ruin all the plates in the box. The pin is unlocked from engagement with the plate-holder only by pushing in the slide b or b' , which depresses the spring and withdraws the pin from the notch v .

The manipulation with this apparatus is as follows: If the apparatus is in the condition shown in Fig. 3 and a plate is to be transported from the box to the plate-holder, the corresponding slide b of the box and the slide i of the plate-holder are opened, the screw s is slackened, and the socket is pressed toward the uppermost photographic plate, Fig. 4. By turning the nut p the plate-shifter sucks fast

to the plate, which is then raised by means of the plate-shifter up to the rear side of the plate-holder. Then the plate-shifter is fixed by means of the screw *s*, slide *b* and slide *i* are closed again, and the plate-holder, with the plate in it, may now be taken off and transferred to the camera. During exposure the plate is retained firmly in place in the holder by the pneumatic pressure. When the last plate has been taken out of the box, the plate-shifter next comes in contact with the plate of pasteboard *c*, and as it cannot grasp it by reason of the hole *d* the fact that there are no more plates in the box is thus readily ascertained. The case cannot be taken off before the slide *b* is closed, as one of the pins *u u'* catches into a corresponding notch *v* of the case when the slide of the box is opened. These pins are disposed in the frame of the box and are under the action of springs *w*, Fig. 2. The object of these pins is to prevent the case being taken off before the corresponding slide of the box is closed, which would cause the destruction of all the plates inclosed in the box. When a used plate is to be transported from the plate-holder into the box, the mode of proceeding is inverse.

This apparatus may be provided with handles and may be constructed in different forms, corresponding to the different forms of cameras.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a plate-box having a slide, of a plate-holder, and means for locking them immovably together, said locking means being brought into operation by drawing out the slide of the plate-box, substantially as described.

2. The combination with a plate-box having a slide, having undercut guides, of a plate-holder adapted to slide into said guides, and a locking device to unite them automatically said locking device being brought into operation by the drawing out of the slide of the box, substantially as described.

3. The combination with a plate-box having a slide and provided with undercut guides, of a plate-holder adapted to slide into said guides, and having a notch, and a spring-

pin secured to the box and lying in the path of the slide of said box, and adapted to engage with said notch when the slide is withdrawn and the pin is thereby released, substantially as described.

4. The combination with a plate-box, of a plate-holder, a pneumatic plate-shifter mounted thereon and a slide for covering the plate after it has been transferred from the box to the holder by the shifter, substantially as described.

5. A plate-holder adapted to receive a plate within it a plate shifter and retainer mounted on the back of said holder and operating transversely thereto and a slide for covering said plate while held in the holder by the shifting and retaining device, as set forth.

6. A plate-holder having an opening in its back, a flange surrounding said opening, and a pneumatic plate-shifter mounted on said flange and adapted to be moved into and out of the space surrounded by said flange, substantially as set forth.

7. A plate-holder having an opening in its back, a flange surrounding said opening, a plate secured to the flange and having a central neck, and a pneumatic plate-shifter adapted to slide in said neck, substantially as set forth.

8. The combination with a plate-holder having an opening, of a plate covering said opening and provided with a neck, a sleeve sliding in said neck, a rubber disk carried by said sleeve, and a rod attached to the center of the disk and passing through the sleeve, substantially as set forth.

9. The combination with a plate-holder having an opening, of a plate covering said opening and provided with a neck, a sleeve sliding in said neck, a rubber disk carried by the sleeve, a rod attached to the disk and passing through the sleeve, and means for adjusting said rod in the sleeve, substantially as set forth.

Signed by me, at Munich, Bavaria, this 21st day of March, 1898.

JOSEF STARK.

Witnesses:

EMIL HENZEL,
CARL DIX.