

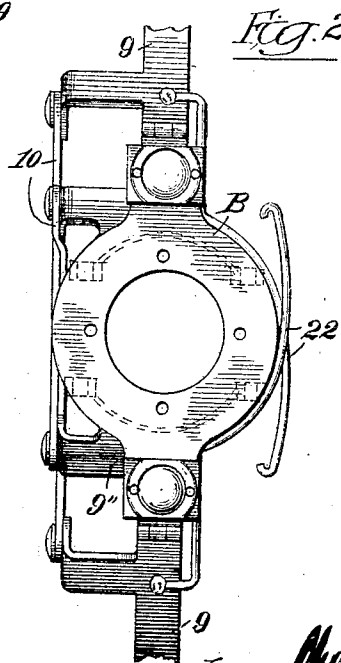
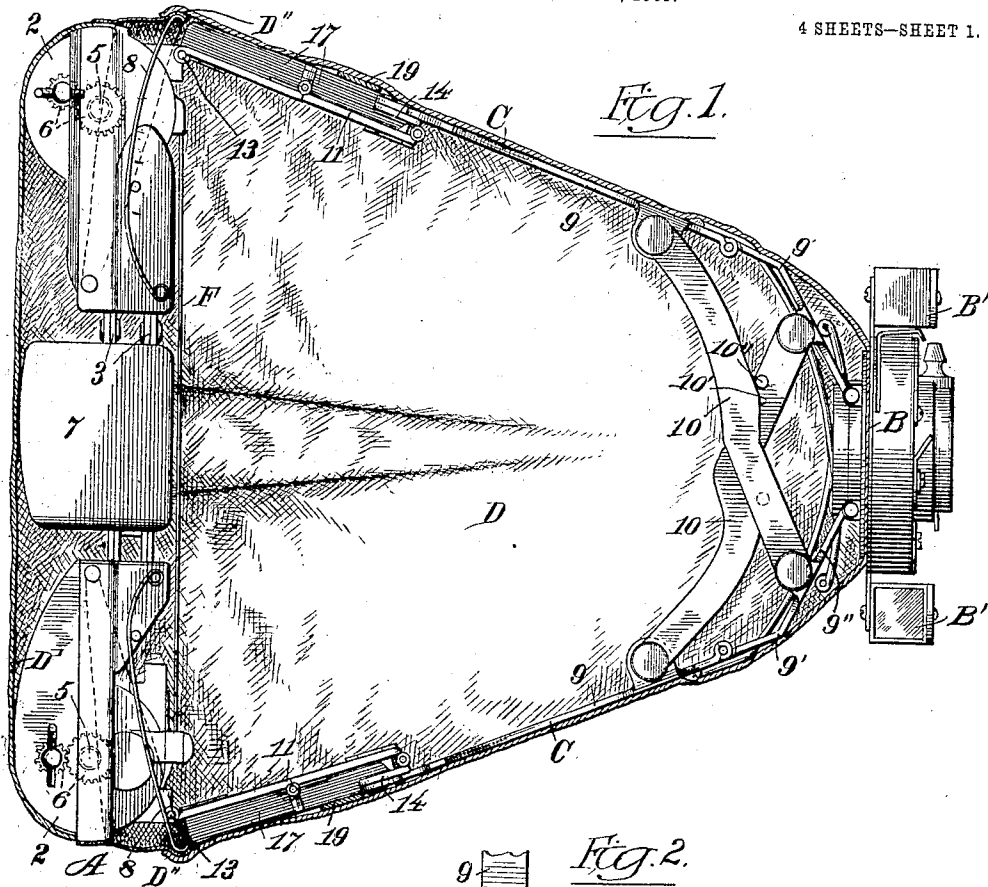
No. 817,245.

PATENTED APR. 10, 1906.

F. HEATH.
POCKET CAMERA.

APPLICATION FILED JULY 24, 1905.

4 SHEETS—SHEET 1.



Witnesses:

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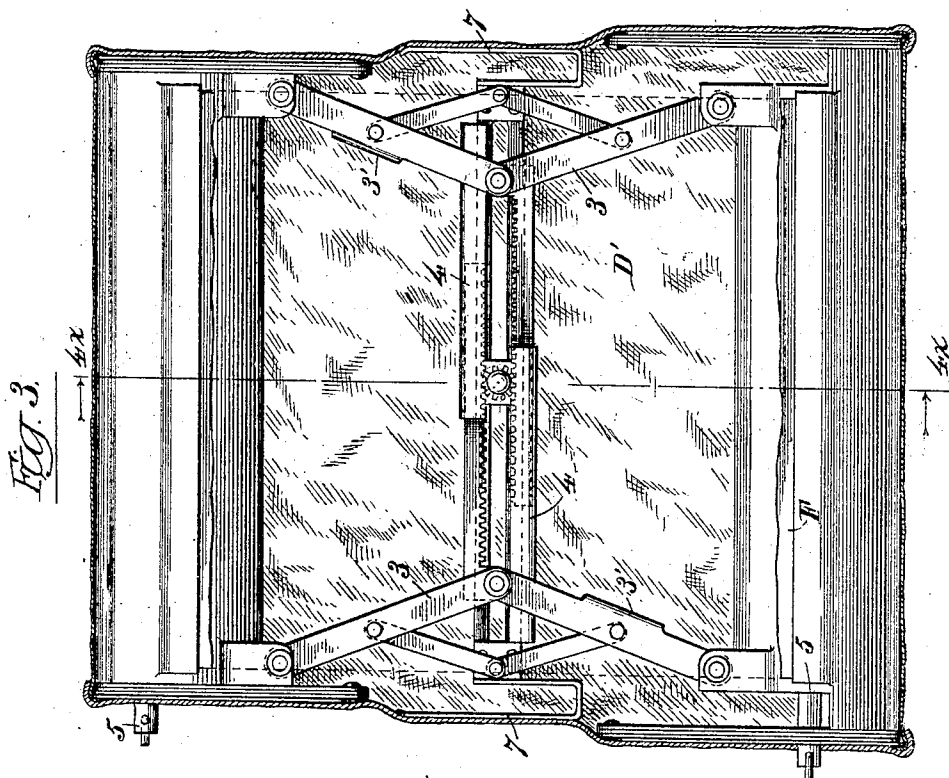
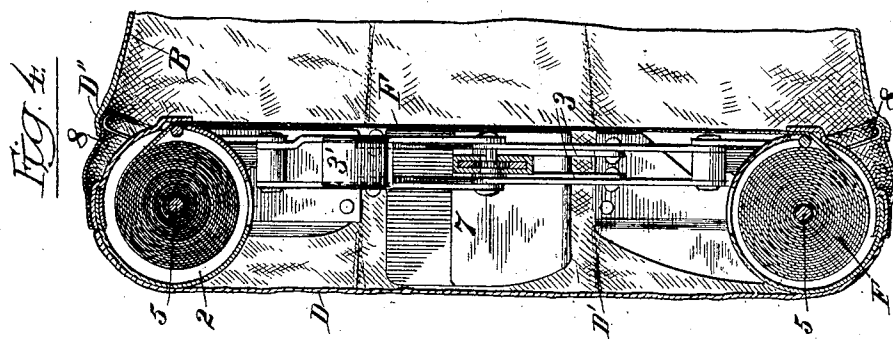
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F. HEATH.
POCKET CAMERA.

APPLICATION FILED JULY 24, 1905.

4 SHEETS—SHEET 2.



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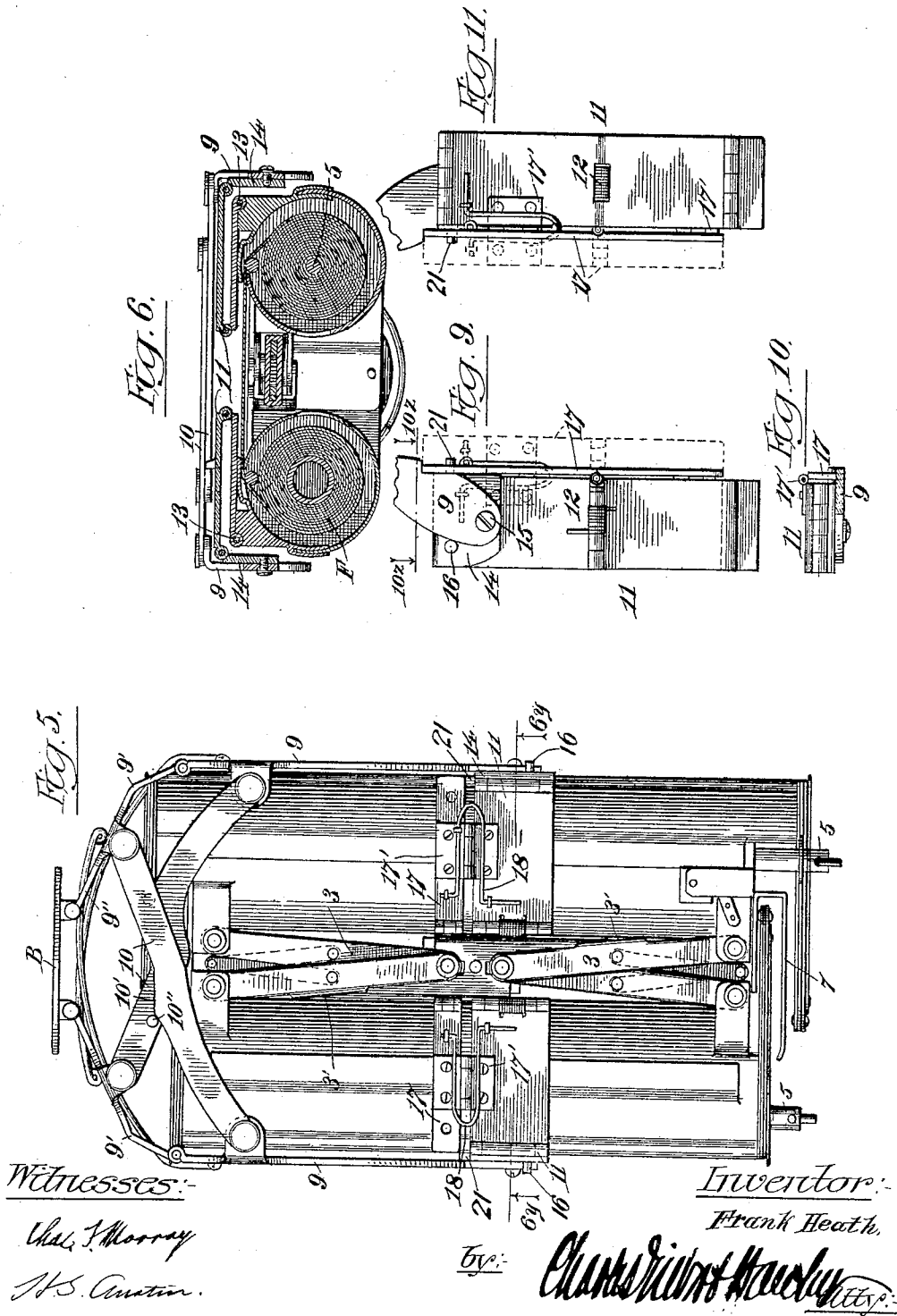
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

Fig. 8.

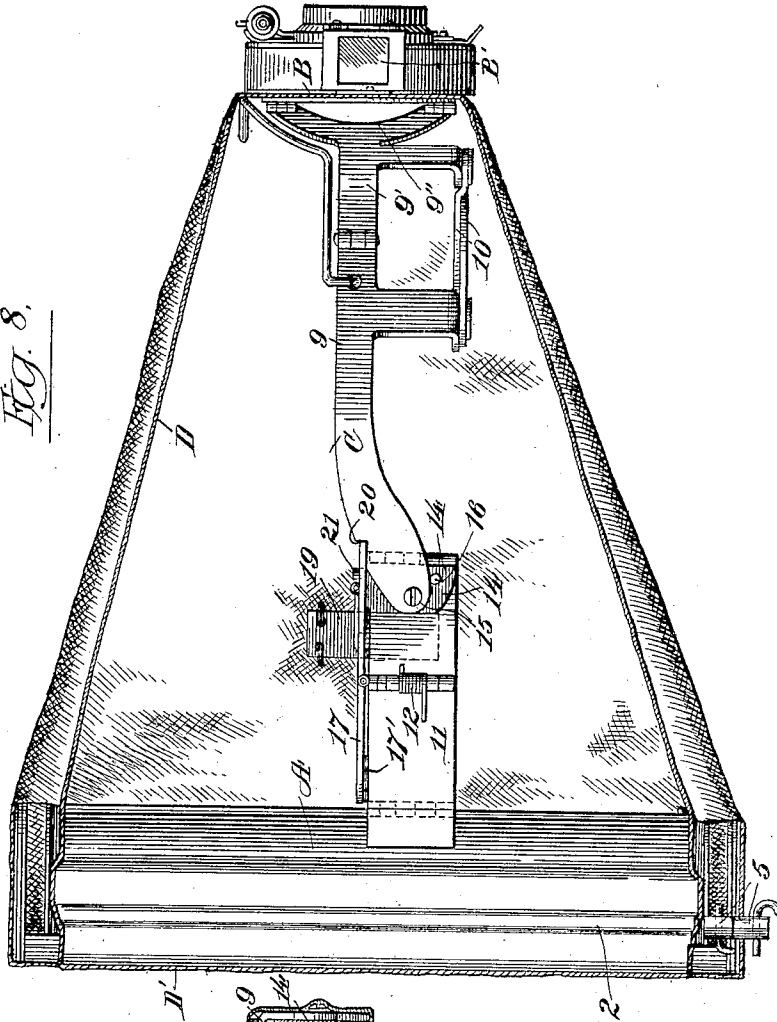
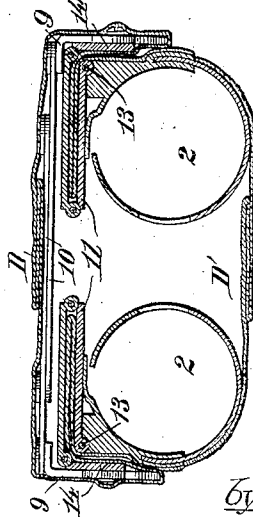


Fig. 7.



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UNITED STATES PATENT OFFICE.

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POCKET-CAMERA.

No. 817,245.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed July 24, 1905. Serial No. 271,023.

To all whom it may concern:

Be it known that I, FRANK HEATH, a citizen of the United States, and a resident of National City, San Diego county, California, have invented a certain new, useful, and Improved Pocket-Camera, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to folding pocket-cameras, and has special reference to improvements upon the pocket-camera that is shown, described, and claimed in my pending application entitled "Pocket cameras," filed November 7, 1904, Serial No. 231,764, and my pending application of the same title, filed April 27, 1905, Serial No. 257,732.

The object of my invention is to improve the structures shown and described in these pending applications; and the specific objects and also the exact nature of my invention are as hereinafter stated and set forth in detail.

The principal feature of my invention resides in a folding or collapsible bellows-supporting mechanism that is interposed between the lens-plate of the camera and the film-holding mechanism thereof.

The invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of my folding or pocket camera, the bottom of the bellows being removed to disclose the parts within the bellows. Fig. 2 is an end view of the lens-plate with parts attached, the bellows being removed. Fig. 3 is a rear end view of the camera, the front of the bellows being removed to disclose the internal members. Fig. 4 is a sectional view on the line 4^x 4^x of Fig. 3. Fig. 5 is a front elevation of the camera in folded or collapsed condition, the bellows being removed to disclose the mechanism. Fig. 6 is a sectional view on the line 6^y 6^y of Fig. 5. Fig. 7 is a view similar to Fig. 6, but showing the various parts of the bellows folded. Fig. 8 is a side view of the camera with the side of the bellows removed to show the bellows-supporting mechanism. Fig. 9 is a detail view taken from Fig. 8. Fig. 10 is a detail section on the line 10^z 10^z of Fig. 9;

and Fig. 11 is a view similar to Fig. 9, showing the opposite side of the supporting-bar.

My camera as disclosed in this and the other applications is characterized by a distensible film-holding mechanism that enables the taking of pictures of different sizes, and which mechanism is adapted to be collapsed or folded into a small space.

My camera is further characterized by a mechanism that supports the lens-plate and operates to distend the bellows or light-excluding closure and which is so constructed that it may be folded or collapsed against the film-holding mechanism, with the lens-plate in position at the ends of the latter, the camera as a whole being folded into a very small body.

The particular object of this invention is to improve the construction and the arrangement of the collapsible mechanism employed for connecting the lens-plate with the film-holding mechanism; and another object of the invention is to do away with the supporting levers or bars upon the exterior of the bellows, as illustrated in the pending application, and substitute foldable lens-plate supports that shall be arranged within and hidden by the bellows. This supporting mechanism, it is understood, is employed not alone as a means to support the lens-plate at a fixed distance from the sensitized film or plate, but is also the means employed for distending the bellows. The dimensions of the supporting mechanism are determined by the height and length of the bellows, the latter being of necessity of sufficient length to permit the lens-plate to be turned upward over the end of the film-holding mechanism. For these reasons I find it desirable to make the plate-supporting mechanism from a number of pivotally connected or hinged parts, adapted to be folded together, but furnishing a rigid plate-supporting structure when distended.

Referring now to the drawings, A represents the film-holding mechanism of my camera; B, the lens-plate; C, the connecting or supporting mechanism, and D the bellows. Briefly, the film-holding mechanism is constituted by the film-roll cases 2 2, joined by a parallel-motion mechanism 3, whereof 4 is the relatively stationary middle bar or member. This mechanism enables the film-roll cases to

be collapsed together or distended to expose more or less of the sensitized film F. The film is wound upon shafts or rollers 5 in the film-roll cases, the same being operated by two gear-trains 6, as shown in Fig. 1. The film-roll cases are of such construction that they may be opened for the insertion or removal of the film, and at the back these cases are joined by the leather bellows part D', the same extending between the hinged parts of said cases. The parallel-motion mechanism and the bellows-folding devices 7 thereon are of the construction illustrated in my former application, except that the width of the part 7 is increased and the link members of the parallel-motion mechanism are made double, with rigid connections 3', as shown in Figs. 3 and 4. The bellows or light-excluding closure is preferably made of leather and is substantially pyramidal in form. The rear edges of the front or pyramidal portion of the bellows are attached to the sides of the film-roll cases and to the upper and lower edges of the flexible back D'. When the film-roll cases are folded or collapsed, therefore, the top, bottom, and back of the bellows are folded or creased by the folding members 7, presenting in cross-section the appearance of Fig. 7. I allow considerable slack D' in the bellows edges, which are attached to the forward parts of the film-roll cases, to compensate for the extended and collapsed positions of the parts and employ springs 8 on the film-roll cases, the office of the latter being to take up the slack and keep the bellows tight or taut when extended, as in Figs. 1 and 8. The forward edges of the bellows are attached to the lens-plate B. This lens-plate may be of any desired form, and bears the lens, the shutter, and one or more finders B'.

The plate-supporting mechanism comprises, essentially, two bars having their ends attached to the film-roll cases and to the lens-plate. These bars are separated when the film-roll cases are distended and are closed together when the roll-cases are collapsed.

It is obvious that a lens-plate connected to the film-holding mechanism by continuous non-jointed side bars would be moved toward and from the film upon movement of the film-roll cases. Such movement would alter the focal distance between the lens and the film, and for this reason I employ a focal-distance-maintaining mechanism between the side bars, the same operating to hold the lens-plate at a fixed distance from the film for all relative positions of the film-roll cases. The chief members of the side bars or lens-supporting devices are the levers or bars 9 9, provided with the bends 9' and having yoked ends 9'' pivoted upon the lens-plate B. The distance-maintaining mechanism is arranged between the bars 9 9 and

comprises the cross-links 10 10, pivoted upon depending lugs on parts 9 and 9' and provided with cam-surfaces and pins 10' and 10'', which, with the angular parts of the bars 9, operate to compensate for the opening and closing movement of the bars 9. The members which I use for connecting the rear ends of bars 9 9 to respective film-roll cases comprise the compound hinges 11 11. These hinges are of identical construction, but occupy reversed positions. The main hinge has a spring 12, which tends to straighten the hinge, and the rear end of the hinge is pivoted upon the film-roll case, the pivot 13 being parallel with said case. The hinge therefore is adapted to fold against the forward side of the film-holding mechanism, as shown in Figs. 5, 6, and 7. The forward end of the hinge is provided with a leaf 14, hinged parallel with 13, and to which the rear end of the bar 9 is attached by a transverse pivot 15.

16 is a stop-pin on the part 14 for the bar 9. When the parts are in position of Fig. 8, the parts 9, 14, and 11 are parallel; but when folded, as in Fig. 7, the leaves of the hinge 11 are at right angles to the leaf 14 and the bar 9, thus permitting the bar 9 to be raised and lie parallel with the film-roll case at the side thereof, as shown in Figs. 5 and 7. Obviously when the parts are thus folded the flexible leather sides of the bellows, being pressed inward, will fold inward with the hinges 11 11. (See Fig. 7.) To afford the required rigidity in the hinge members 11 when distended, I provide each thereof with a supplementary hinge 17, having the edges of its leaves attached to the upper edges of the hinge 11 by hinges 17'. The middle hinges or pivots of the parts 11 and 17 are in the same plane. Therefore when the hinges occupy vertical planes the whole device may be folded as a single hinge; but downward-folding springs 18 are provided on the hinges 11 17, and when the hinge 11 is straightened the hinge 17 turns outwardly and downwardly at right angles to the other, serving thereafter as a stiffening bar or flange and preventing the collapse of the hinge until the supplementary part 17 is raised. This movement of the supplementary or stiffening hinge is accomplished by pressing inward upon the sides of the bellows, and to facilitate the movement and avoid wear upon the bellows I attach to the latter small metal plates 19. (See Fig. 8 and Fig. 1.) When these are pressed against the free edges of the hinge 17, the latter readily rise into parallelism with the lower hinge members, and continued pressure against the plate 19 operates to fold the hinges and collapse the structure against the film-roll cases. This should only be done when the film-roll cases are folded, as in Fig. 5. To avoid further rigidity and to

prevent the accidental lifting of the lens-plate when the parts are extended, I provide the ends of the bars 9 with shoulders 20 and the leaves 14 with pins 21, to be engaged by the leaves of the supplementary hinge members 17, as shown in Figs. 8, 9, 10, and 11. These parts prevent the accidental collapse of the connected members, serving to lock them in position. The supplementary hinge therefore serves two offices, that of a stiffener or flange and that of a lock—that is, the leaves 17 turn down over the respective pins 21, forming a connection that resists inward pressure on the hinges until the leaves 17 are lifted, and thereby disengaged from the pins 21.

At the top and front of the lens-plate-supporting mechanism and, if desired, the bottom also I provide the springs 22. These springs operate against the inner side of the bellows and take up the slack in the top thereof, thereby preventing the bagging of the bellows to such extent as to interfere with the rays of light between the lens and the film. The use and operation of the springs are illustrated in Figs. 1, 2, and 8.

The operation of my invention is as follows: When the parts are folded, they present the appearance of Fig. 5, and the flexible leather bellows completely incases the metallic parts of the camera except the lens-plate. The lens-plate at this time is directly above the collapsed film-roll cases, and the camera forms a neat compact body or package that may be carried in the pocket. When it is desired to use the camera, the lens-plate is first thrown downward and forward, the springs of the hinges serving to project the plate into position or relation shown in Fig. 8. As soon as the bars 9 have been turned down into contact with the stop pins or lugs 16, the locking-hinge 17 will move into locked position, thus making the side bars rigid and preventing vertical movement of the lens-plate with reference to the film-holding mechanism. The camera is now in condition for use, provided only a narrow picture or negative is wanted. In case the operator desires a picture of greater size, he simply separates or distends the film-roll cases by drawing them apart, he being relieved of all detail operations by the automatic action of the supporting and focal-distance-maintaining mechanism. The film is wound upon the receiving-roll after each exposure and each time the camera is collapsed.

My invention includes numerous modifications, all within the scope of the claims and which will readily suggest themselves to one skilled in the art. This being the case, my invention is not confined to the specific construction herein shown and described.

I claim—

1. In a folding camera, distensible film-holding means and a lens-plate normally parallel with said means, but adapted to be positioned at the end thereof, in combination with foldable lens-plate-supporting mechanism hinged upon the film-holding mechanism parallel therewith, said supporting mechanism being adapted for folding movements in planes parallel with and also transverse to the plane of the film-holding mechanism, substantially as described.

2. In a folding camera, a lens-plate, in combination with collapsible film-holding mechanism, foldable means, composed of hinged parts connecting said plate and said mechanism, a pyramidal bellows composed of flexible material and extending between said plate and mechanism, and means for taking up the slack in the sides of said bellows, substantially as described.

3. In a folding camera, a lens-plate, in combination with collapsible film-holding mechanism, foldable means composed of hinged parts connecting said plate and said mechanism, a pyramidal bellows composed of flexible material and extending between said plate and mechanism, and automatic means for taking up the slack in the top of said bellows, substantially as described.

4. In a camera of the class described, a lens-plate, in combination with relatively movable film-roll cases, foldable means connecting said plate and cases, bellows composed of flexible material, and springs engaging said bellows and automatically taking up the slack therein when said bellows is in open position, substantially as described.

5. In a camera of the class described, a lens-plate, in combination with film-roll cases and a parallel-motion mechanism connecting the same, hinges attached to said film-roll cases and adapted to fold against the front thereof, and bars transversely pivoted upon the forward leaves of said hinges, and supporting said lens-plate in both folded and open position, substantially as described.

6. In a camera of the class described, a lens-plate, in combination with distensible, collapsible film-holding mechanism, hinges pivoted upon said mechanism, supplementary hinges thereon and serving as stiffening-flanges when the hinges are opened, and suitable means pivotally connecting said lens-plate to said hinges, substantially as described.

7. In a camera of the class described, suitable film-holding mechanism in combination with hinges pivotally attached thereto, bars transversely pivoted upon the forward ends of said hinges, supplementary hinge parts adapted to stiffen and lock said hinges and

bars in certain positions, and a lens-plate attached to said bars and movable therewith, substantially as described.

8. In a camera of the class described, a
5 lens-plate, in combination with collapsibly-connected film-roll cases, inwardly-collapsible hinges pivoted upon said cases, supplementary hinges thereon adapted to fold outward and lock the hinges when opened, suitable pivotal means connecting said hinges to
10 said lens-plate, and suitable bellows inclosing

said film-holding means and the hinged members, the latter being adapted to be collapsed by pressure upon the sides of said bellows, substantially as described.

In testimony whereof I have hereunto set my hand, this 17th day of July, 1905, in the presence of two subscribing witnesses.

FRANK HEATH.

Witnesses:

W. F. EATON,
C. McINNIS.