

No. 662,998.

Patented Dec. 4, 1900.

J. S. WRIGHT & C. S. GOODING.

PHOTOGRAPHIC CAMERA.

(Application filed Aug. 19, 1899.)

(No Model.)

6 Sheets--Sheet 2.

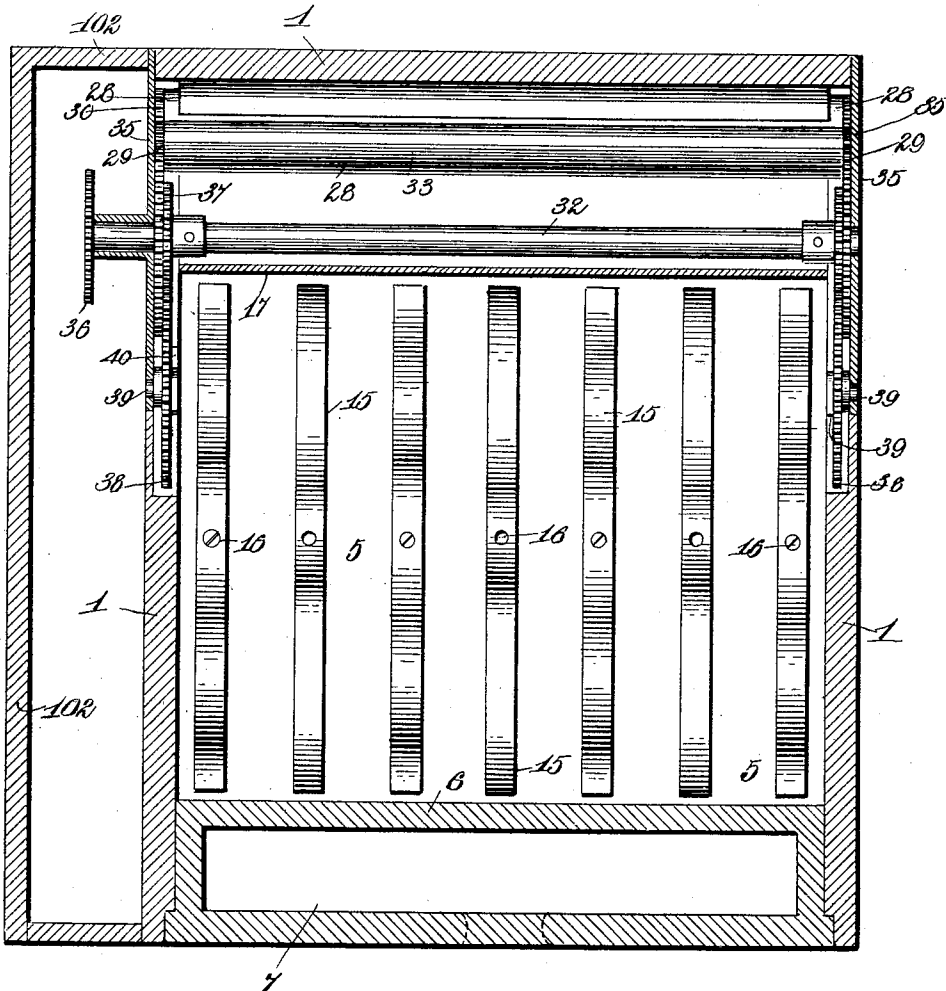


Fig-2-

WITNESSES-

Wm. H. Varnum.

Sydney O. Taft.

INVENTORS-

John S. Wright & Chas. S. Gooding

by their atty, Charles S. Gooding.

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6 Sheets- Sheet 3.

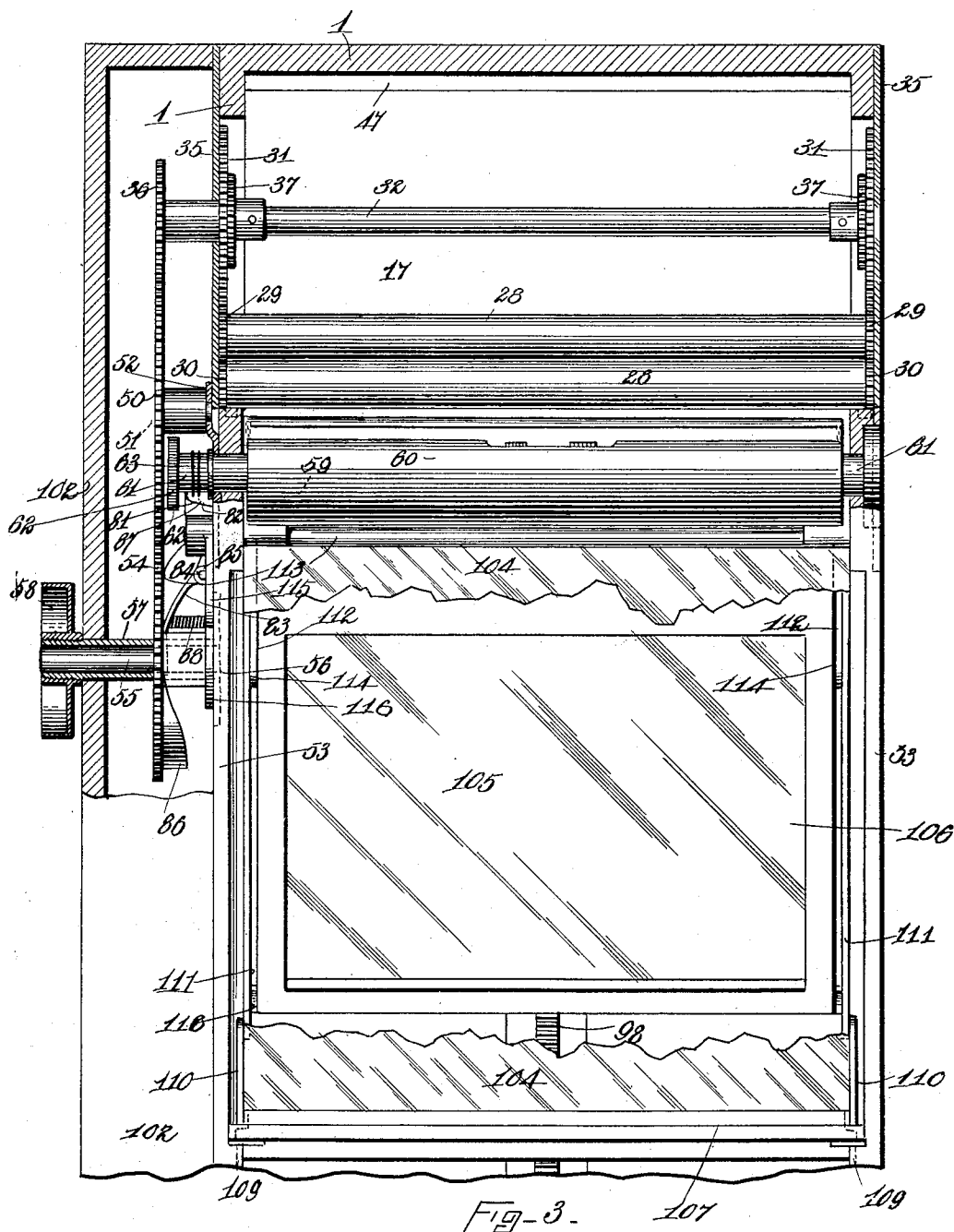


Fig-3.

WITNESSES.

Wm. H. Varnum.

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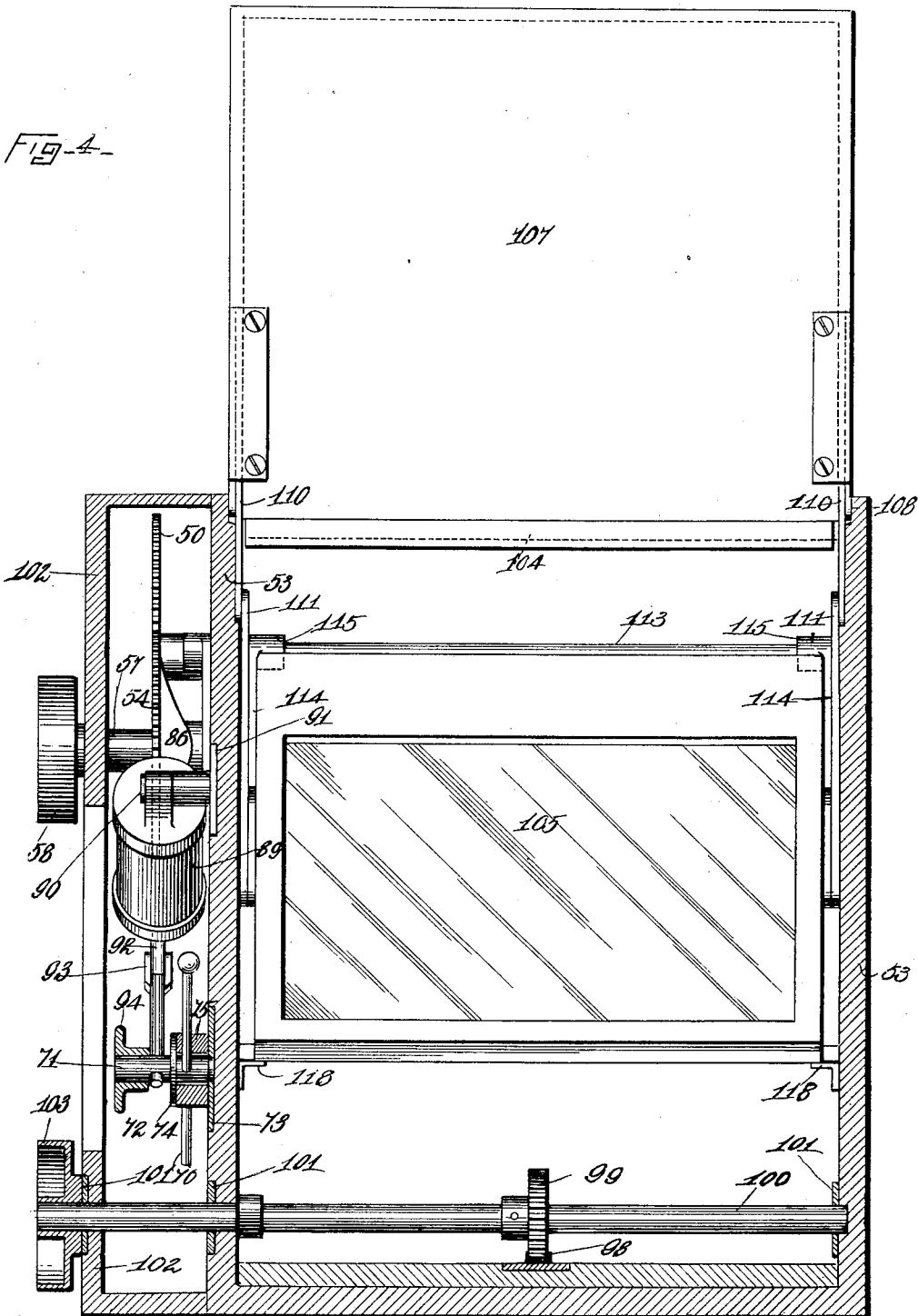
PHOTOGRAPHIC CAMERA.

(Application filed Aug. 19, 1899.)

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6 Sheets—Sheet 4.

Fig-4-



WITNESSES-

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PHOTOGRAPHIC CAMERA.

(Application filed Aug. 19, 1899.)

(No Model.)

6 Sheets--Sheet 5.

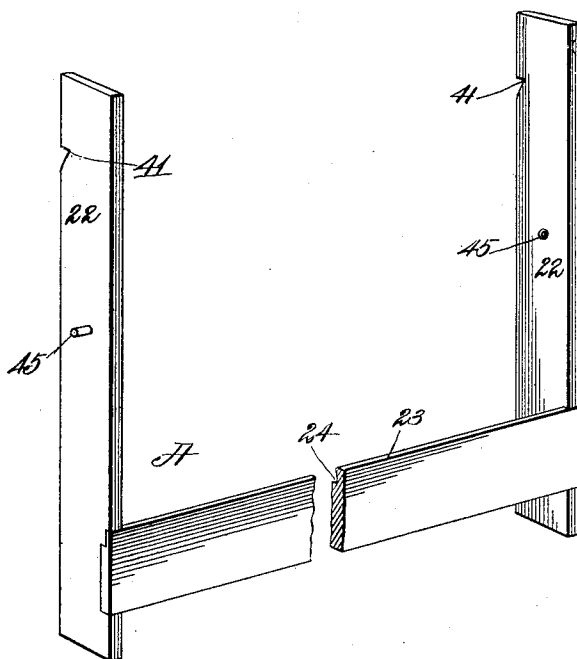


Fig-5-

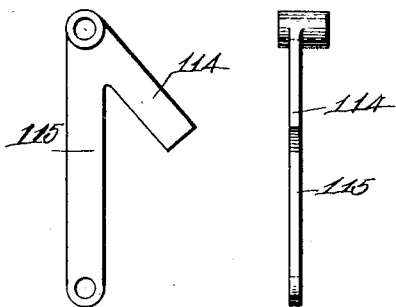


Fig-6-

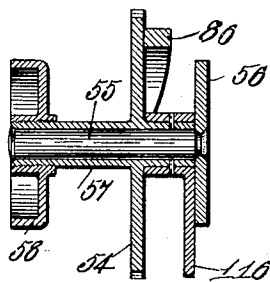


Fig-7-

WITNESSES—

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John S. Wright & Chas. S. Gooding,
by their atty, Charles S. Gooding.

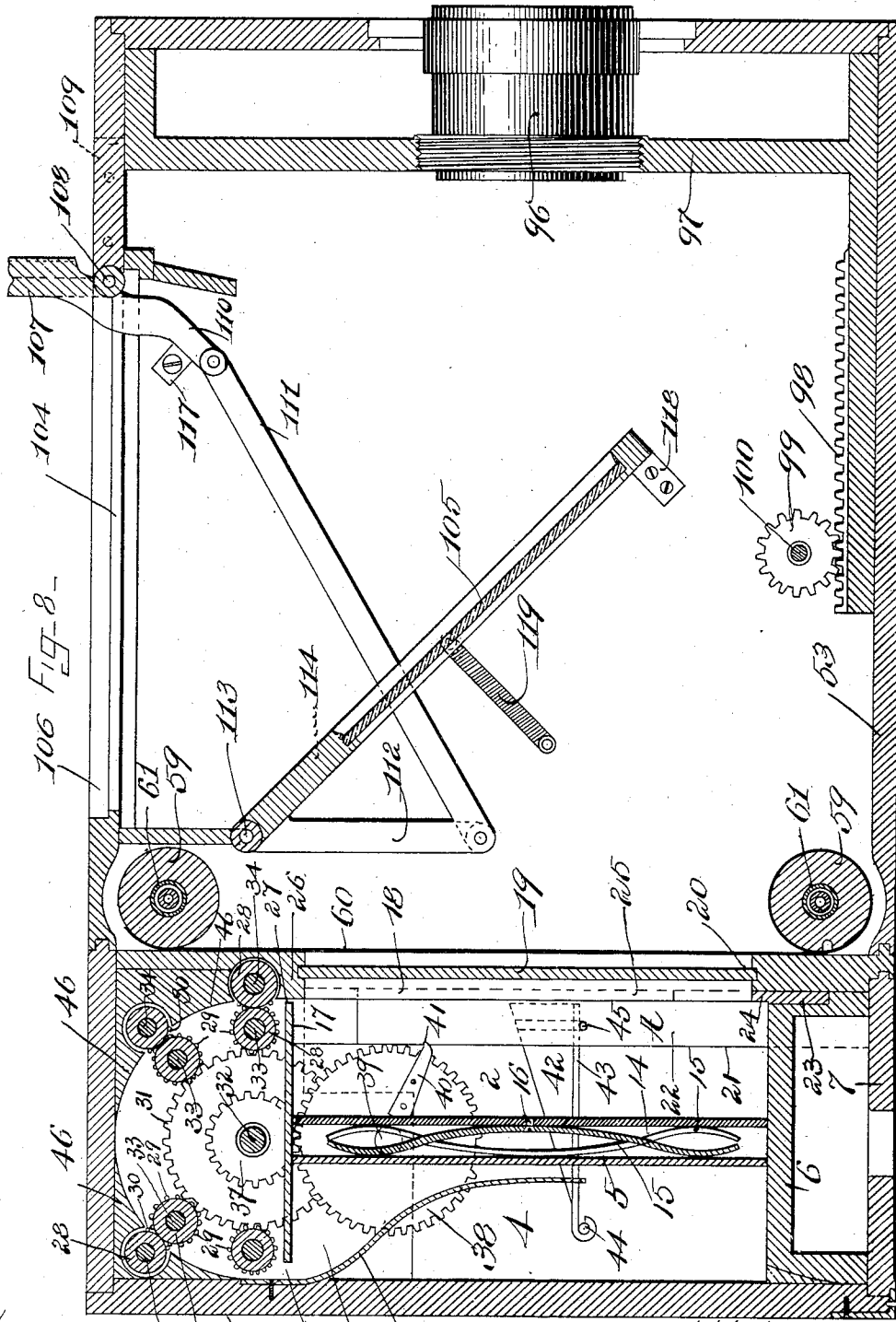
J. S. WRIGHT & C. S. GOODING.

PHOTOGRAPHIC CAMERA.

(Application filed Aug. 19, 1899.)

(No Model.)

6 Sheets--Sheet 6.



WITNESSES.

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INVENTORS.

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UNITED STATES PATENT OFFICE.

JOHN STRATTON WRIGHT, OF DUXBURY, AND CHARLES S. GOODING, OF
BROOKLINE, MASSACHUSETTS.

PHOTOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 662,998, dated December 4, 1900.

Application filed August 19, 1899. Serial No. 727,858. (No model.)

To all whom it may concern:

Be it known that we, JOHN STRATTON WRIGHT, residing at Duxbury, in the county of Plymouth, and CHARLES S. GOODING, residing at Brookline, in the county of Norfolk, State of Massachusetts, citizens of the United States, have invented new and useful Improvements in Cameras, of which the following is a specification.

10 The object of this invention is to produce a "camera" which shall be compact and durable in construction and convenient, simple, and rapid in the operation of its working parts.

15 Our improved camera comprises in its construction, first, a magazine for cut plates or films, substantially the same as that described and illustrated in a separate application, Serial No. 728,026, filed August 21, 1899; second, a "focal-plane shutter," substantially the same as that described in another application, Serial No. 728,025, filed August 21, 1899; third, a lens and mechanism for adjusting the same, and, fourth, a reflecting-mirror and finder, with a cover for said finder and connected mechanism for automatically operating in correct time said magazine, shutter, reflecting-mirror, and cover.

25 The invention consists in mechanism for operating the reflecting-mirror and the cover for the finder.

30 The invention further consists in mechanism for automatically operating in correct time with relation to each other the shutter and magazine.

35 The invention still further consists in mechanism for automatically operating in correct time with relation to each other the shutter and magazine, reflecting-mirror, and the cover for finder.

40 Referring to the drawings, Figure 1 is a side elevation of our improved camera, partly broken away in section and with the side cover of the case removed. Fig. 2 is a vertical section taken on line 2 2, Fig. 1. Fig. 3 is a plan view of a portion of our camera, partly broken away and shown in section, as on line 3 3. Fig. 4 is a vertical sectional elevation, line 4 4, as viewed from the right of Fig. 1. Fig. 5 is a perspective view of the cut-plate-carrier slide broken away to save

space. Fig. 6 is a detail side and front elevation of the arm to which the mirror is attached. Fig. 7 is a detail section, line 7 7, Fig. 1. Fig. 8 is a vertical central longitudinal section.

Like letters and numerals refer to like parts throughout the several views of the drawings.

In the drawings, 1 is the casing or box of the magazine for cut plates or films.

2 is the chamber containing the unexposed cut plates, and 4 is the chamber into which the unexposed cut plates are carried by the mechanism hereinafter described. The chamber 2 is separated from the chamber 4 by a fixed partition 5. The bottom wall 6 of said chambers 2 and 4 is removable and is fast to a removable cap 7. A sliding partition 14 is kept pressed against the unexposed cut plates in the chamber 2 by a series of flat springs 15, fastened alternately to the fixed partition 5 and the sliding partition 14 at the center of said springs by screws 16.

The upper edges of the cut plates in the chamber 2 are guided by a fixed horizontal partition 17, which extends from side to side of the casing 1. In the front of the cut-plate holder is a rectangular opening 18, said opening being about one-fourth inch shorter on each side than the cut plates. A slide 19 is inserted through a groove 20 in the side of the casing 1 to cut off the light from the cut-plate chamber in the usual manner. The casing 1 is grooved at 21 21 to receive the sliding pieces 22, said sliding pieces being joined together by the cross-piece 23. The cross-piece 23 is grooved at 24 throughout the entire length thereof to a depth equal to the thickness of one of the cut plates. The side pieces 22 and cross-piece 23 are rigidly connected together and form, as a whole, the cut-plate-carrier slide A.

The springs 15 force the cut-plates forward toward the opening 18, the bottom side of the foremost cut plate resting against the cross-piece 23 in the groove 24, the two sides of said cut plate being pressed against the strips 25 25, and the top side being pressed against the strip 26, said strips and cross-piece forming the four sides of the opening 18. By raising the cross-piece 23, as hereinafter described,

the cut plate nearest the opening 18 (after being exposed) will be pushed up through the slot 27 until it is caught between the rubber-covered rolls 28.

5 The rolls 28 are geared together by pinions 29 30, said pinions 29 being rotated by gears 31, fast to a shaft 32. The shaft 32 and shafts 33 34 have bearings in plates 35 on each side of the casing 1. Upon the outside of the casing 1 is a gear 36, fast to the shaft 32, by means of which said shaft and the other gearing fast thereto is rotated. The gear 36 is rotated by mechanism hereinafter described.

10 Upon each side of the casing 1, on the inner side thereof and fast to the shaft 32, is a pair of gears 37. Each of said gears 37 meshes a gear 38. The gears 38 turn upon studs 39, riveted to the plates 35, and have riveted to the face thereof a finger 40, which engages a notch 41 in the sliding pieces 22 22. The casing 1 is recessed at 42 to receive the wire spring 43, said spring being fast at 44 to the casing 1 and bearing at its free end upon a pin 45, fast to the sliding piece 22.

25 The operation of the mechanism whereby the exposed cut plate in the chamber 2 is carried over into the chamber 4 is as follows: The gear 36 being turned in the direction of the arrow *b*, the other gearing will rotate in the directions indicated by the arrows, Fig. 1. The fingers 40 will be moved upwardly, raising the sliding pieces 22 22 and cross-piece 23, pushing the film, which rests upon the groove 24, up through the slot 27 until its upper edge engages the rolls 28, when the cut plates will be carried forward to the second pair of rolls, being guided thereto by the curved guides 46 and thence to the next pair of rolls and finally through the opening 47 into the chamber 4, light springs 48 guiding the cut plates as they enter said chamber 4 and holding them against the partition 5. After the top edge of the cut film has been taken by the first pair of rolls the ends of the fingers 40 clear the sliding pieces 22 and allow them, together with the cross-piece 23, to be brought back to the position shown in the drawings by the action of the spring 43.

45 It is evident that the mechanism for imparting the herein-described reciprocating motion to the cut-plate-carrier slide may be varied without departing from the spirit of our invention.

50 The gear 36 is rotated by an intermediate gear 50, which rotates upon a stud 51, fast to the plate 52, said plate being fastened to the casing 53 of the camera. The intermediate gear 50 is rotated by a gear 54, which turns upon a stud 55, fast to a plate 56, fast to the casing 53 of the camera. The gear 54 is connected by a sleeve 57 to a hand-wheel 58, by means of which said gear 54 and the train of gearing hereinbefore described are rotated.

55 59 59 are wooden rolls, to which is attached the curtain 60. Each of said rolls is attached to a tube 61, having a flange 62 thereon. The tubes 61 61 are connected together by two

wires 63 64, each wire fastened to said tubes in such a manner that when the wire 63 is coiled several times around the lower tube 61 the other end of said wire 63 will be nearly uncoiled from the upper tube 61, whereas the wire 64 will at the same time be coiled several times around the upper tube 61 and nearly uncoiled from the lower tube 61, and vice versa. To the wire 63 is fastened a block 65, with pins 66 66 thereon. Said pins engage slots 67 67 in the forked piece 68, said forked piece forming a part of a spring-lever 69, in which the spring-wire 70 is fastened to said forked piece 68 and passes through a hole in the rocking pin 71. Said pin rocks in bearings in the bracket 72, fast to the case 53. The bracket 72 is formed of two plates 73 74, fastened together by studs 75. The spring-wire 70 is held at the end opposite to the forked piece 68 by hooks 76, fast to a segmental plate 77, fast to the casing 53.

80 It will be seen that by placing the spring-wire in different hooks on the upper side of the center line *a a*, Fig. 1, the tension upon the spring may be varied and the block 65 forced down against the stop 78, fast to the casing 53, as in the drawings.

85 If it is desired to set the curtain to move downwardly, Fig. 1, the wire 70 is carried over at its right-hand end, Fig. 1, to the lower side of the center line *a a* and hooked into one of the hooks 76 on the lower side of said line *a a*. This will bend the spring 70 and cause it to press upwardly upon the block 65.

90 The block 65, wires 63 and 64, and the parts connected thereto are locked in position by blocks 79 and 80, fast to the wire 63. The block 69 is shown locking said parts in the drawings, said block being located between two ears 81 81 on the locking-plate 82, said plate being fastened to the casing 53.

95 The block 79 is thrown out from between the ears 81 and the spring-lever 69 allowed to act by a lever 83, pivoted at 84 to two ears 85 85 upon the locking-plate 82. The right-hand end of said lever, Fig. 2, is depressed at the proper time by the cam-shaped projection 86 upon the rear face of the gear 54, thus raising the left-hand end of said lever, Fig. 1, and throwing the block 79 out from between the ears 81, and the spring-lever 69 then throws the block 65 and wire 63 upward until the block 79 strikes the stop 87, when the block 80 will be opposite the space between the ears 81, and the lever 83 having been drawn down by the spring 88 the block 80 will drop in between the ears 81, locking the wire 63 and its connecting parts.

100 In order to graduate the speed of the curtain for instantaneous work, we provide a pneumatic cylinder, pivoted at 90 to a plate 91, fast to the casing 53, and having a double-acting piston therein fast to a piston-rod. Said piston-rod 92 is pivotally connected to a forked arm 93, said arm passing through a hole in the rocking pin 71 and being clamped thereto by a set-nut 94. The arm 93 has grad-

uations 95 thereon, so that the arm 93 may be set at different points with relation to the center of the rocking pin 71, and thus the distance through which the end of the arm 93 moves may be varied, and hence the travel of the piston and piston-rod in the cylinder 89 will be varied, compressing the air more or less and varying the speed at which the curtain is carried by the spring-lever 69 through the intermediate connections hereinbefore explained.

The curtain 60 has a slot therein, the width of which may be varied, as described in an application hereinbefore referred to on "Focal-plane shutters," or in any of the methods now in use for accomplishing the same result.

The camera herein described may also be arranged to take pictures by time exposure in the same manner as described in said application for "Focal-plane shutters." The lens 96 is fast to a frame 97, arranged to slide in the casing 53 and having a rack 98 fast thereto, meshing a pinion 99, fast to a shaft 100, having bearings 101 in the casing 53 and in the side-cover 102 of said casing. The shaft 100 is rotated by the hand-wheel 103, fast thereto, all in a manner well known to those skilled in the art and forming no part of this invention. In the upper side of the casing 53, Fig. 1, we provide a ground-glass "finder" 104, upon which is thrown a reflection of the picture by a mirror 105. An opening 106 in the casing 53 above the finder 104 is closed by a cover 107, pivoted at 108 on each side of the casing 53 to plates 109, fast to said casing. Two arms 110, one on each side of the cover 107, are connected by links 111 to arms 112, fast to a rock-shaft 113. The arms 112 each have a projection 114 thereon, to which is fastened the mirror 105. On the outside of the casing 53 is an arm 115, fast to said rock-shaft 113 and bearing against an open cam-plate 116, fast to the cam-gear 54. To prevent the cover 107 from passing beyond a right angle, Fig. 1, we provide a stop 117, against which the arm 110 strikes when the cover 107 is open at right angles, the mirror 105 at the same time resting on stops 118, fast to the sides of the casing 53. A spiral spring 119 serves to draw the mirror 105 down and to hold the arm 115 against the cam 116.

The operation of the mechanism hereinbefore described as a whole is as follows: The parts being in the position shown in Fig. 1, the right-hand end of the spring 70 is carried over to the lower side of the center line *a a* and hooked under one of the hooks 76 on the lower side of said line *a a*. The lens 96 is then adjusted by turning the hand-wheel 103 until the reflection upon the finder 104 is in focus. The hand-wheel 18 is then rotated, turning the cam-plate 116, raising the arm 115, and rotating the rock-shaft 113 to an extent sufficient to raise the mirror 105 and lower the cover 107 to a horizontal position through the arm 112, link 111, and arm 110. As soon as the mirror 105 is raised out of the

path of rays of light from the lens 96 and the cover 107 is closed over the opening 106 the cam 86 strikes the right-hand end of the lever 83, depressing said lever at the right and elevating it at the left of the pivot 84, thus lifting the block 79 from between the ears 81, releasing the spring-lever 69, which carries the block 65 upward with the wire 63 and other parts connected thereto until the block 79 strikes the stop 87, and the block 80 being then opposite the space between the ears 81 will drop in between said ears. It is evident that as the wire 63 moves up as described the curtain 60, with the slot therein, will move down across the face of the sensitized cut plate, which rests, as heretofore described, against the carrier-slide A. As soon as the curtain 60 has completed its motion, as described, a further rotation of the hand-wheel 58 will bring the arms 90 into connection with the notches 41 in the sides 22 of the carrier-slide A, through the rotation of the gears 54 50 36, shaft 32, gears 37, fast to 32, and gears 38, meshing said gears 37. The exposed plate will then be carried up out of the chamber 2 and over into the chamber 4, as hereinbefore described. After the plate is removed from the chamber 2 and as soon as the gear 54 has made one complete rotation the parts will assume the relative positions shown in Fig. 1, the cover 107 assuming a vertical position and the mirror a position at forty-five degrees, as shown.

It will be evident from the foregoing description that it would be impossible for a film or plate to be exposed twice. It will also be understood that only three motions are necessary in taking a picture—namely, first, setting the spring-lever 69; second, focussing the picture, and, third, rotating the hand-wheel 58 once.

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

1. In a camera, a mirror, fast to a rock-shaft having bearings in the casing of said camera, a finder, a cover for said finder pivoted to said casing, and operative mechanism connecting said mirror and said cover, whereby when the mirror is raised the cover will be closed and vice versa, in combination with mechanism for alternately raising and lowering said mirror, substantially as described.

2. In a camera, a mirror fast to a rock-shaft having bearings in the casing of said camera, a finder, a cover for said finder and operative mechanism connecting said mirror and cover, whereby when the mirror is raised, the cover will be closed and vice versa, in combination with an arm fast to said rock-shaft, a rotatable cam 116 and means for rotating said cam.

3. In a camera, a magazine for cut plates or films, having two chambers therein, and mechanism for carrying a cut plate or film from one to the other of said chambers, in combination with a mirror pivoted to the cas-

ing of said camera, a finder, a cover for said finder pivoted to said casing, and operative mechanism connecting said mirror and said cover, substantially as described.

5 4. In a camera, a slotted curtain, actuating mechanism for imparting motion to said curtain in opposite directions, and means for locking said actuating mechanism; a mirror
10 fast to a rock-shaft having bearings in the casing of said camera, a finder, a cover for said finder, and operative mechanism connecting said mirror and cover, whereby when the mirror is raised the cover will be closed, and vice versa, in combination with mechanism
15 for raising said mirror and mechanism for unlocking said curtain-actuating mechanism, substantially as described.

5. A camera, comprising in its construction a magazine for cut plates or films, having two chambers therein, and mechanism
20 for carrying a cut plate or film from one to the other of said chambers, a slotted curtain, actuating mechanism for imparting motion to said curtain in opposite directions, and means for locking said curtain-actuating
25 mechanism; in combination with mechanism for automatically unlocking said curtain-actuating mechanism and imparting motion to said cut-plate-carrying mechanism, substantially as described.

30 6. A camera, comprising in its construction, a magazine for cut plates or films, having two chambers therein and mechanism for carrying a cut plate or film from one to the other of said chambers; a slotted curtain, actuating mechanism for imparting motion to
35 said curtain in opposite directions, and means for locking said curtain-actuating mechanism;

ism; a mirror fast to a rock-shaft having bearings in the casing of said camera, a finder, a cover for said finder, and operative mechanism connecting said mirror and cover, whereby when the mirror is raised the cover will be closed, and vice versa; in combination with mechanism for imparting motion to said cut-plate-carrying mechanism, and mechanism for raising and lowering said mirror; substantially as described.

7. A camera, comprising in its construction, a magazine for cut plates or films, having two chambers therein and mechanism for carrying a cut plate or film from one to the other of said chambers; a slotted-curtain-actuating mechanism for imparting motion to said curtain in opposite directions, and means
55 for locking said curtain-actuating mechanism, a mirror fast to a rock-shaft having bearings in the casing of said camera, a finder, a cover for said finder, and operative mechanism connecting said mirror and cover, whereby when the mirror is raised, the cover will be closed, and vice versa; in combination with a cam 86, for unlocking said curtain-actuating mechanism, gears 54, 50, and 36 for imparting motion to said cut-plate-carrying mechanism, and cam 116 for raising and lowering said mirror, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOHN STRATTON WRIGHT.
CHARLES S. GOODING.

Witnesses:

H. E. CILLEY,
SYDNEY E. TAFT.