

April 21, 1931.

A. W. CAPS

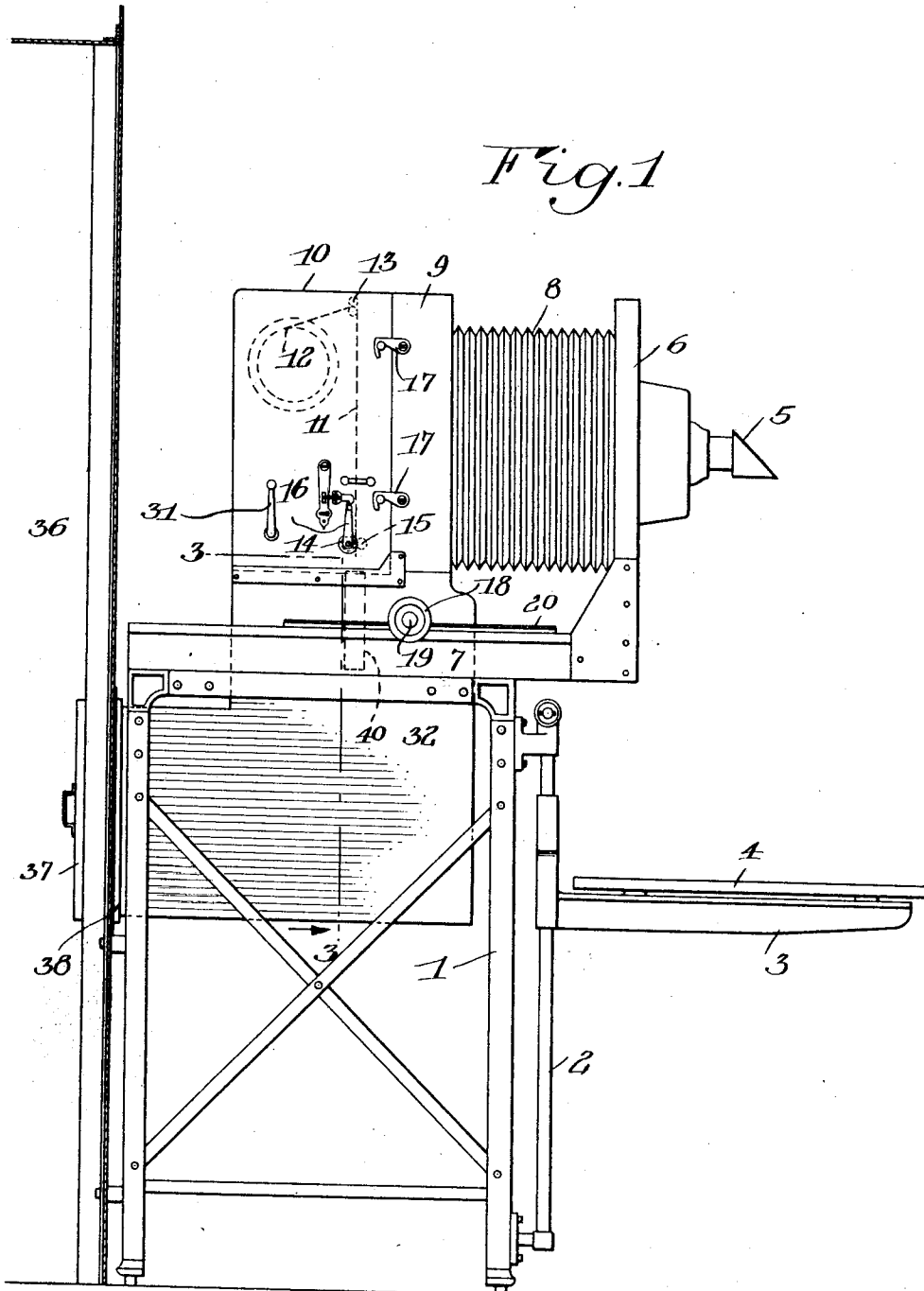
1,801,540

PHOTOGRAPHIC COPYING MACHINE

Filed March 1, 1928

4 Sheets-Sheet 1

Fig. 1



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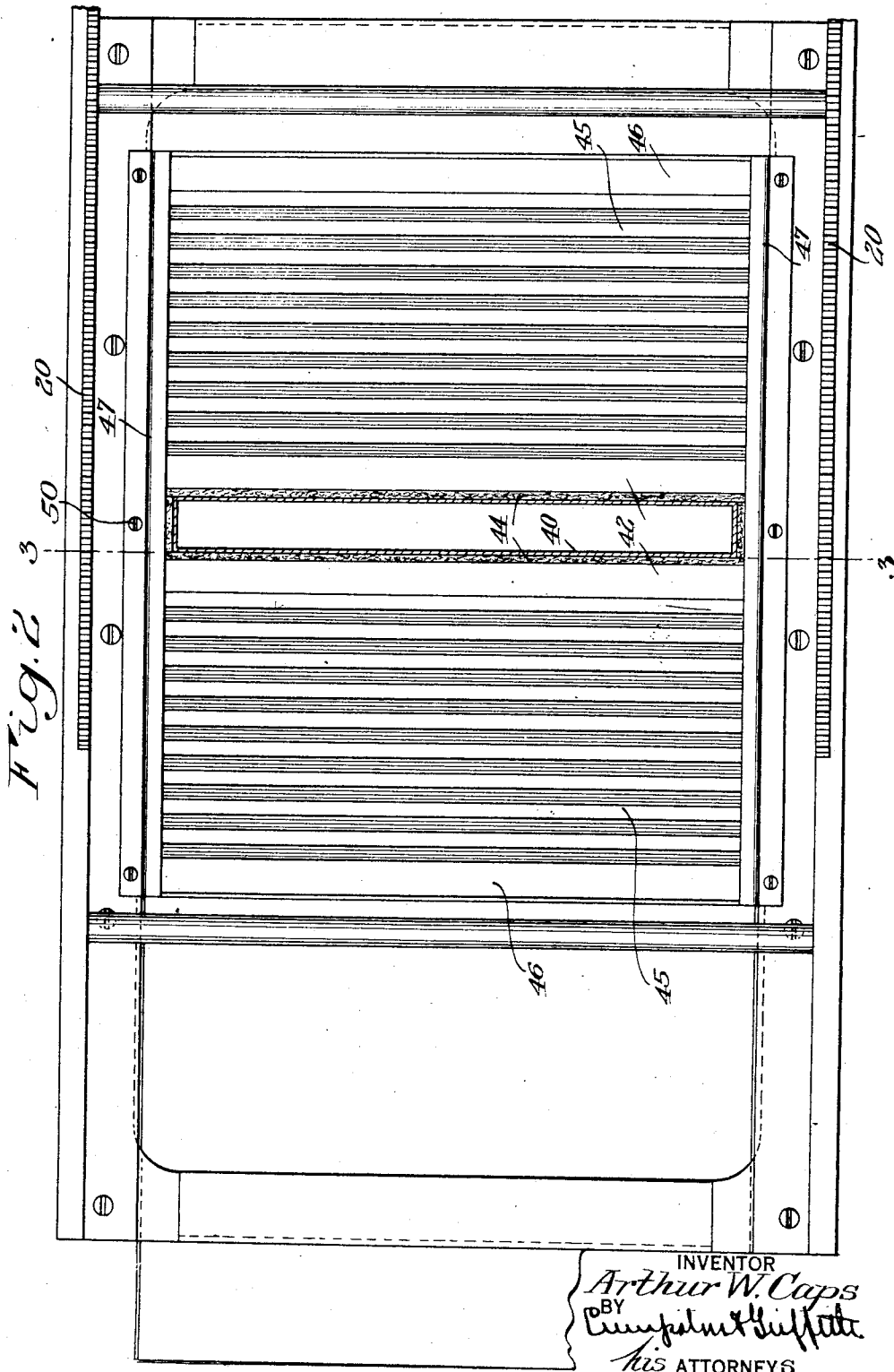
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PHOTOGRAPHIC COPYING MACHINE

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4 Sheets-Sheet 2



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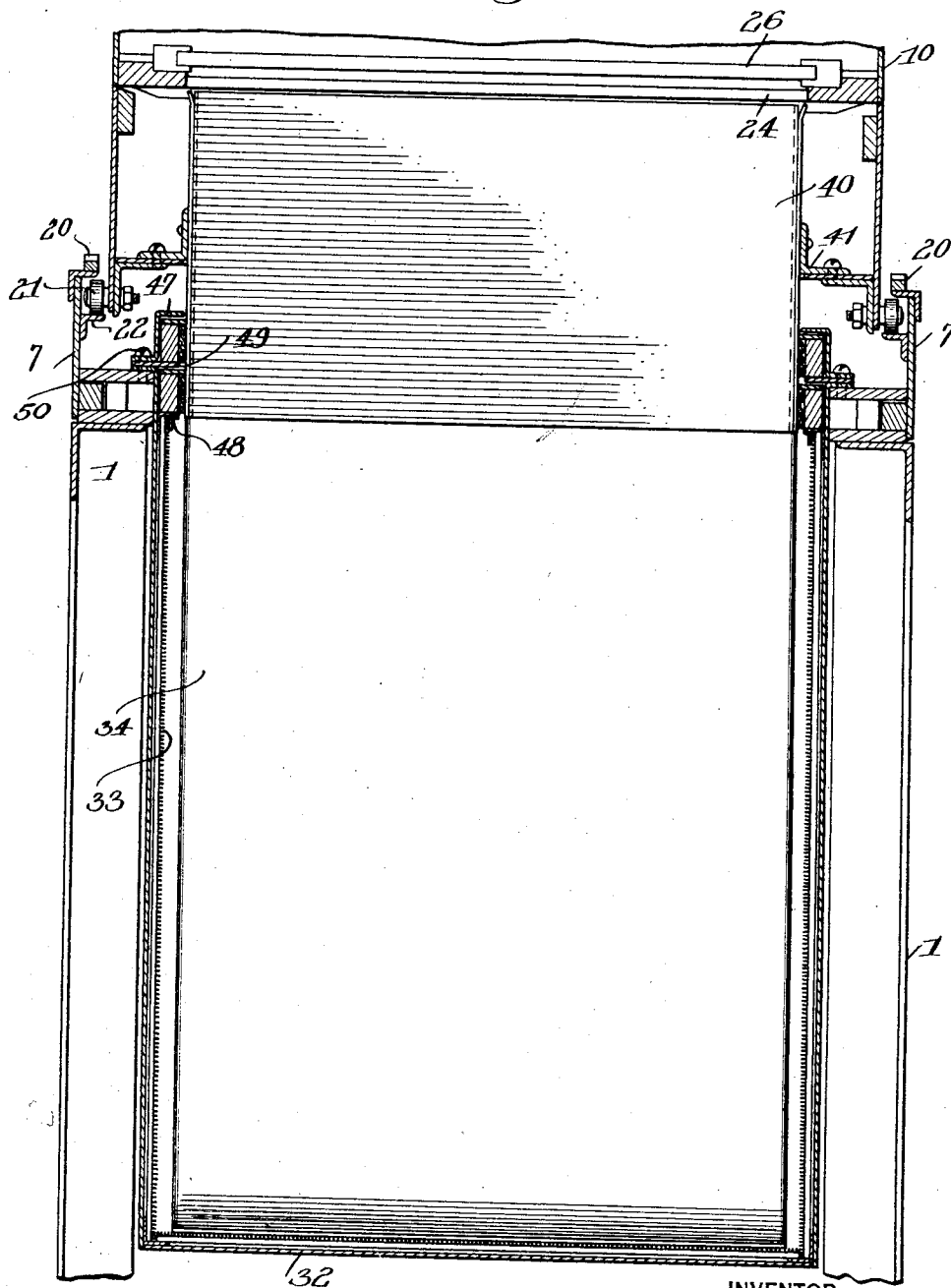
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PHOTOGRAPHIC COPYING MACHINE

Filed March 1, 1928

4 Sheets-Sheet 3

Fig. 3



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PHOTOGRAPHIC COPYING MACHINE

Filed March 1, 1928

4 Sheets-Sheet 4

Fig. 4

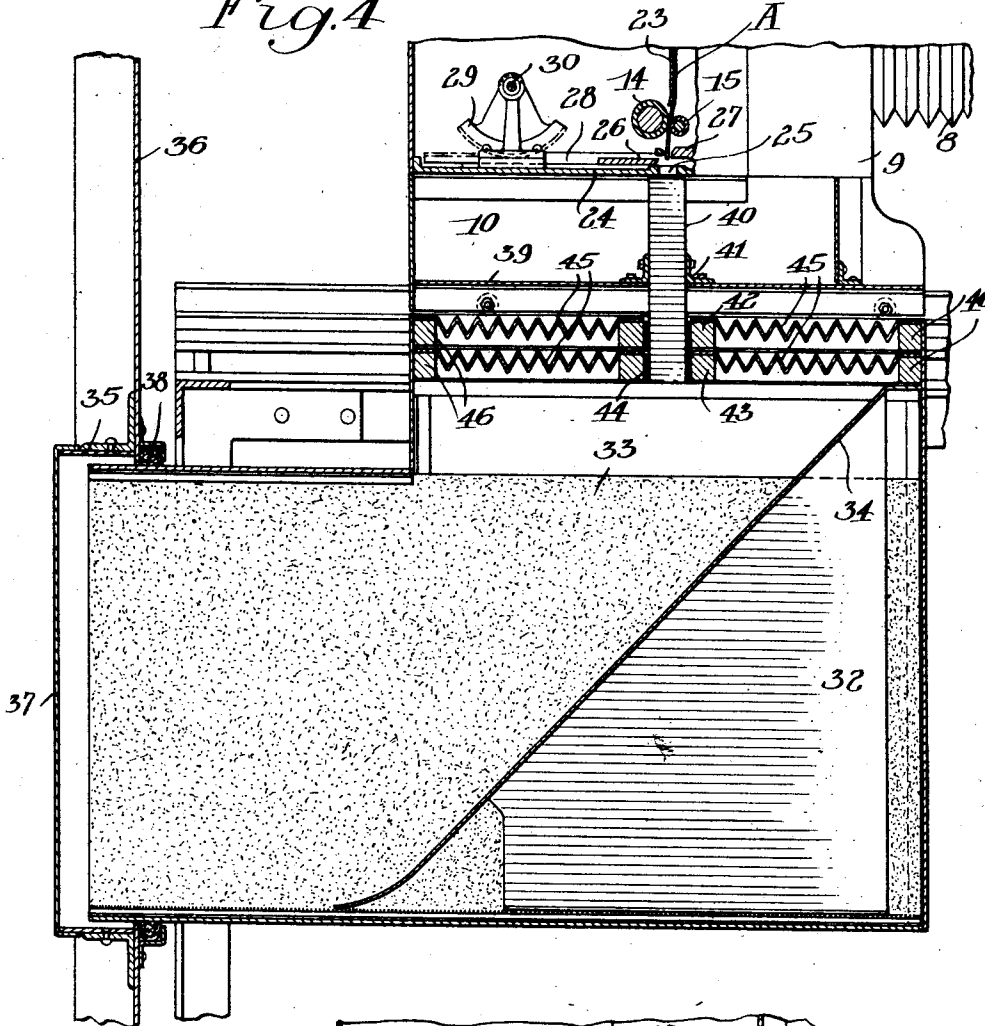
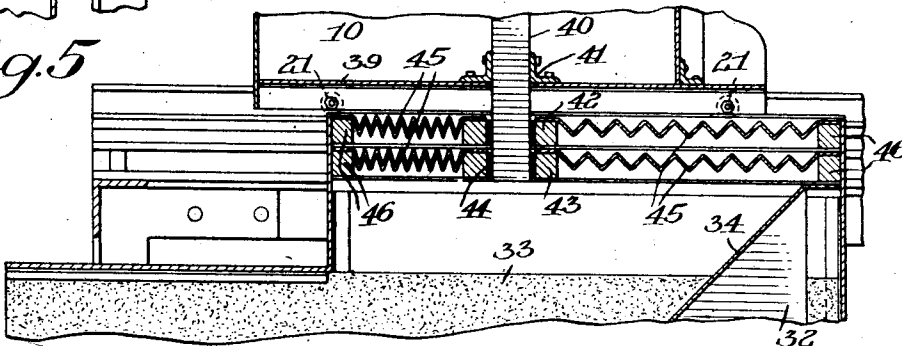


Fig. 5



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UNITED STATES PATENT OFFICE

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PHOTOGRAPHIC-COPYING MACHINE

Application filed March 1, 1928. Serial No. 258,364.

My present invention relates to photography, and more particularly to photographic copying cameras of the type generally referred to as "copying cameras", which are used primarily for photographically copying for record documents and other articles. The invention has for its object the provision of a simply constructed and conveniently operated machine of this character that will be compact, and particularly adapted for uses in which the prints are not immediately or automatically developed, but are accumulated in a dry state for future development. The improvements are further directed toward providing a machine of this character in connection with a dark room from the interior of which the collected prints may be removed and treated. A feature of the invention is an arrangement whereby a camera of the type that is focused by moving the body instead of the lens is so associated with a stationary drop box that the prints are delivered to the latter through a light tight panel whatever the position of the body.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a side view of a photographic copying machine associated with a dark room, and constructed in accordance with and illustrating one embodiment of my invention, a fragment of a dark room being shown in section;

Fig. 2 is an enlarged top plan view of the dark box beneath the camera body taken in horizontal section through the delivery chute;

Fig. 3 is an enlarged fragmentary transverse vertical section through the dark box and adjacent portions of the camera body taken substantially on the lines 3—3 of Figs. 1 and 2;

Fig. 4 is an enlarged fragmentary longitudinal central section through the dark box

and the lower portion of the camera body showing the parts in one position, and

Fig. 5 is a fragmentary view giving a part of the showing of Fig. 4 but with the parts in another position.

Similar reference numerals throughout the several views indicate the same parts.

I will first describe the general elements of the machine, the relative arrangements of which are well known in this class of camera, together with a general reference to the major elements of my new combination, as my invention is embodied therein.

Referring more particularly to Fig. 1, 1 indicates the table frame carrying suitable vertical guides 2 on the front thereof upon which guides may be adjusted vertically for focusing in connection with desired size ratios of reproduction a copyholder 3 carrying, in the present instance, a copy board 4 on which the documents to be copied are placed. Centered above the copyholder is the usual lens tube and prism 5 for collecting the rays and directing them at right angles through the axis of the camera to the focal plane thereof. The lens tube is mounted on a front 6 which is carried by a bed 7 and is fixed with relation to supporting structure set for adjustments provided for the purpose of leveling and centering the lens. The body portion of the camera which is connected to the front 6 by bellows 8 consists of a front frame 9 and a rearward portion 10 hinged thereto to cooperate therewith in a plane just forward of the focal plane of the camera, which focal plane is indicated generally at 11. The body portion 10 may be swung open rearwardly to gain access to the focal plane and to the roll of sensitized material 12 which is drawn therethrough over guide rolls 13 by feed rolls 14 and 15 operated from the exterior by means of a crank handle 16. When closed the two parts of the camera body are held tightly together by fastening devices 17. The camera body is moved back and forth on the bed 7 by means of a knob 18 on a shaft 19 extending through the body, and having a pinion thereon cooperating with a rack 20 on the bed. In Fig. 3 are shown rollers 21 on the side walls of the camera body which sup-

port the latter for movement by rolling on tracks 22 on the bed piece 7.

In Fig. 4 is shown more in detail the manner in which the print or sensitized strip indicated at A is drawn by the feed rollers 14 and 15 across the focal plane support shown at 23. The bottom of the camera body 24 is provided with a delivery opening 25 just below the feeding mechanism, the roller 14 of which is turned by the crank 16 before referred to which carries the print or section of sensitized material out through the opening 25 in measured quantity. Each sheet is severed from the continuous strip by suitable shearing knives 26 and 27, one of which is carried by a rack frame 28 to move back and forth across the opening 25. This rack frame is operated by a rocking gear segment 29 on a shaft 30 having an exteriorly arranged crank handle 31, by means of which it is operated.

Supported in fixed position on the frame 1 below the bed 7 and its traveling camera body is a dark box 32. I use the term "dark box" in the familiar sense accepted in the photographic art as meaning a light tight receptacle or holding element for photographically sensitive material. It is lined in the present instance as shown at 33 with black plush or velvet, and has an inclined deflecting wall 34 for directing prints falling therein toward its rearward end. This rearward end is removably telescoped into the frame 35 of a front opening in the wall of a dark room 36 adjacent to which the machine is placed, but from which it may be withdrawn at will. The dark room opening is normally closed by a door 37 and suitable light tight glands are provided at 38 in the sliding joints between the two elements.

Referring more particularly to Figs. 2, 4 and 5, the bottom of the camera body 10 below the bottom 24 before referred to is provided with a partition 39 to prevent light from entering the camera through the opening 25. Extending through the partition and carried thereby is a chute 40 the upper end of which cooperates with the delivery opening 25 in a relationship whereby it receives the prints issuing therefrom. The chute is preferably supported in this position by means of brackets 41 fixed in one of the elements and secured to the other by screws, which when they are moved, allow of the removal of the chute. The lower end of the chute below the partition extends through a pair of frames 42 and 43 which are superposed upon each other and provided with felt or other padding at 44 to make a light tight connection. On each side of each frame, taken forwardly and rearwardly of the camera, is secured one end of the flexible top covering for the dark box preferably in the form of a leather or fabric bellows piece 45. In each case the opposite end of the

flexible piece is connected to a fixed frame 46. Thus it will be seen that as the camera body is moved back and forth for focusing or other purposes carrying the chute with it the latter will always remain in communication with the dark box below to deliver the prints therein as they are severed by the knife. During these movements the double bellows or flexible elements 45 collapse on one side and extend themselves on the other as the case may be, as shown comparatively in Fig. 5. At the same time, the dark box is protected from the entrance of light from above between the movable elements just as the interior of the camera body is protected from below by the partition 39.

Of course it would be an obvious reversal of parts gaining substantially the same effect to mount the carrying partition 39 for the chute on the top of the dark box and place the flexible element in its place in the camera body, except that the camera would always have to be brought back to the same point before feeding and severing the print after exposure.

In the present instance frames 42 and 43 as best shown in Figs. 2 and 3 slide in suitable upper and lower ways on the frame 1 the upper ways in the present instance being formed by a Z-bracket 47, and the lower one by a bracket 48. A plate 49 held by the screws 50 of the upper way bracket intervenes between the two frames and makes it impossible for light to get around both of them through these ways.

I claim:

1. In a photographic copying machine, the combination with a dark box having a light tight flexible collapsible and expansible top covering, of a camera body movable over the top covering and provided with supporting and delivering mechanism for sensitized sheets, and delivering means carried by the camera body and extending transversely of its path of travel and transversely through the flexible top of the box to deliver the prints from the camera body into the latter, movement of said camera body over said box causing collapse of said top covering on one side of said delivering means and expansion thereof on the opposite side of said delivering means.

2. In a photographic copying machine, the combination with a dark box having a light tight flexible top provided with a substantially centrally arranged sliding frame, the flexible portions of the top on opposite sides of said frame being respectively adapted to collapse and expand as the frame is moved, of a camera body movable over the box and provided with supporting and delivering mechanism for sensitized sheets, and a chute carried by the camera body and extending through the frame in the flexible top of the

box to deliver the prints from the camera body into the box.

3. In a photographic copying machine, the combination with a dark box, of ways associated therewith, a frame movable on the ways across the dark box and collapsible and extensible bellows elements connecting the frame to parts fixed relatively to the box, a camera body movable over the box and provided with supporting and delivering mechanism for sensitized sheets, and a chute carried by the camera body and extending through the frame in the flexible top of the box to deliver the prints from the camera body into the box.

4. In a photographic copying machine, the combination with a dark box having a light tight top composed of a pair of substantially centrally arranged frames and a pair of flexible bellows elements connecting each frame at opposite sides thereof to parts relatively fixed with respect to the box, of guides associated with the box upon which the central frame moves, a camera body movable over the box and provided with supporting and delivering mechanism for sensitized sheets, and a chute carried by the camera body and extending through the frame in the flexible top of the box to deliver the prints from the camera body into the box.

5. In a photographic copying machine, the combination with a dark box having a light tight flexible top covering, of a camera body movable on the box over the covering and embodying a bottom and a partition member below the bottom, the bottom being provided with a print delivery opening, means for supporting sensitive material in the focal plane of the camera and for delivering the same through the delivery opening therein and a chute extending through the partition member and supported thereby, the upper end of the chute being arranged to cooperate with the delivery opening of the camera and the lower end being extended transversely of its path of travel and transversely through the flexible top of the box to deliver prints into the latter.

6. In a photographic copying machine, the combination with a dark room and a dark box arranged exteriorly adjacent thereto but opening into the dark room, said dark box having a light tight flexible top covering, of a camera body movable over the top covering and provided with supporting and delivering mechanism for sensitized sheets, and a chute carried by the camera body and extending transversely of its path of travel and transversely through the flexible top of the box to deliver the prints from the camera body into the latter.

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