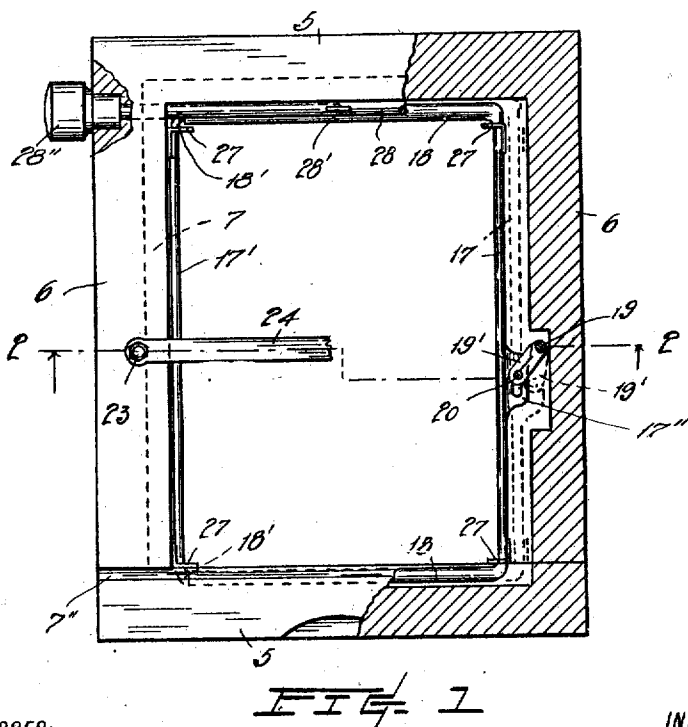
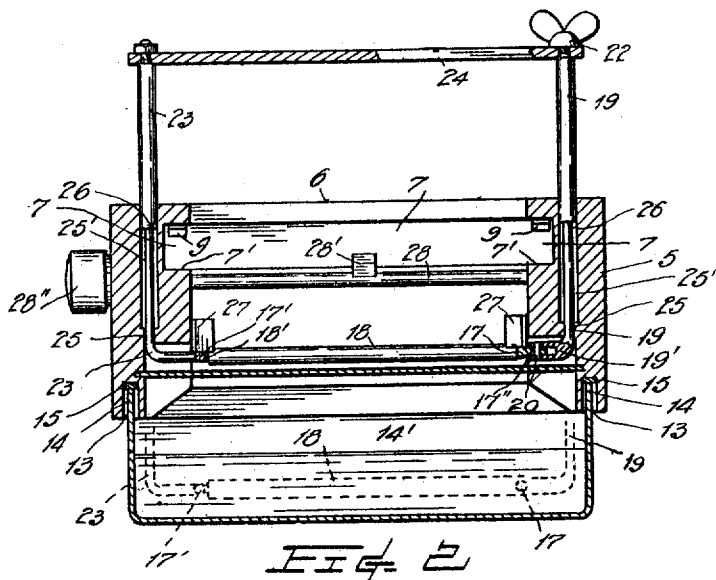


941,643.

Patented Nov. 30, 1909.
 2 SHEETS—SHEET 1.



WITNESSES:

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941,643.

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NEGATIVE DEVELOPER.
APPLICATION FILED OCT. 12, 1907.

Patented Nov. 30, 1909.
2 SHEETS—SHEET 2.

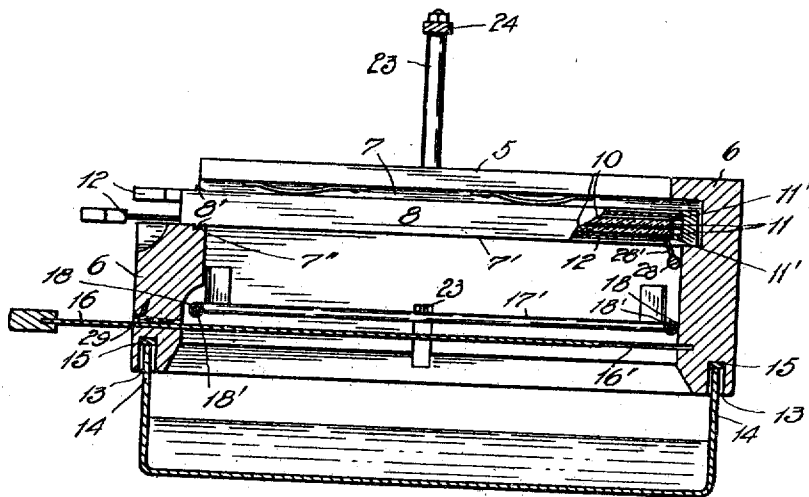


FIG. 3

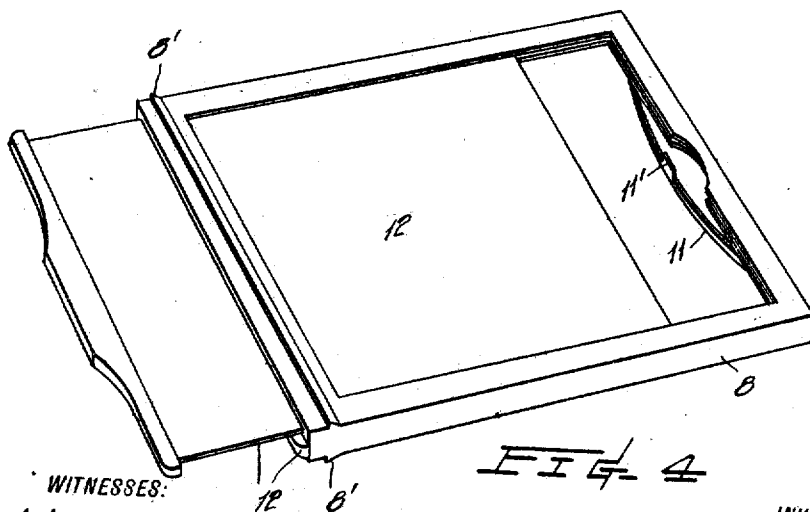


FIG. 4

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NEGATIVE-DEVELOPER.

941,643.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Application filed October 12, 1907. Serial No. 397,053.

To all whom it may concern:

Be it known that I, JOHN S. MILLER, a citizen of the United States, residing at Bergville, in the county of Itasca and State of Minnesota, have invented certain new and useful Improvements in Negative-Developers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to photography; and its object is the provision of means whereby photographic plate-negatives may be conveniently and reliably developed without the use of a dark-room as hitherto. 15 With these and other ends in view, the invention consists in the novel construction and adaptation of devices, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a plan view, 20 partly in horizontal section, of apparatus embodying my invention; Fig. 2 is a transverse vertical section taken through 2—2 of Fig. 1; Fig. 3 is a longitudinal vertical section of the same with a negative holder in 25 place such as now used in the art and for which the illustrated embodiment of the invention is adapted; and Fig. 4 is a perspective view of such a holder.

The reference numeral 5 designates the 30 side, and 6, the end members of a frame which is of rectangular configuration. Adjacent to the top and extending along the sides and across the back end is a recess 7 to afford a receptacle for the plate-holder 8, 35 Figs. 3 and 4, and that the holder will make a light-proof juncture, the bottom surface 7' of the recess is disposed in a plane with a transverse groove 7'' in the head end to receive a protruding strip, such as 8', as 40 common upon this type of holders.

9 are springs which serve to yieldingly maintain the holder against the aforesaid face of the recess and by retaining the strip 8' within the groove prevent the accidental 45 displacement of the holder. This holder is, as usual, formed with two compartments, for the reception of glass plates, or negatives, 10 which are removably retained therein by a spring 11 in each compartment 50 pressing against one end of the respective plate so as to hold the other end in a groove provided at the opposite end of the holder.

As illustrated, the springs are each formed with an outwardly extending centrally disposed projection 11' of such depth as to 55 protrude beyond the outer face of a plate

and to the inner surface of the removable slide 12 which is provided to mask the plate of each of the compartments of the holder.

About the bottom edges of the frame 60 members is a groove 13 whereinto extends the rim 14 of a tray or pan 14' and that the light may reliably be prevented from entering between the frame and tray a flexible gasket 15 is advantageously introduced 65 into this groove.

16 is a removable shutter which fits in a groove 16' adjacent the lower edge of the frame to exclude the light from the space 70 thereabove when the tray is removed.

Within the frame is a rectangular rack 70 formed of lateral members 17 and 17' which are respectively bent to form end members 18 and 18' of which the parts 18 are of tubular form to provide sheaths of the 75 parts 18', that is, to make a telescopic connection whereby the member 17 may be adjustably moved to approach or recede from the part 17'. I accomplish these movements by means of an upright rod 19 extending 80 downwardly through the adjacent side of the frame and having at its lower end a bifurcated crank-arm 19' which straddles an ear 17'' upon the part 17 and connected therewith by a pin 20 fixedly connected 85 with the arm and movably so with the ear by the provision of an elongated slot 21 in the latter. 22 is a butterfly head upon the rod 19 for turning the same to effect the inward or outward movement of the rack- 90 part 17 with respect to the other part 17'.

The rack is arranged for vertical movement, so that it can be lowered from an elevation above the plane of the shutter 16, as indicated by full lines in Fig. 2, to a sufficient distance therebelow to submerge it in 95 the liquid contained in the tray, or as represented by broken lines in the same view. To attain this movement of the rack I utilize the rod 19 and another upright rod 23 100 which is fixedly connected to the rack member 17' and extends above the top of the frame where it is connected with the other rod, 19, by a cross bar 24.

To prevent the light from entering the 105 frame through the holes 25 in which the rods 19 and 23 pass through the walls thereof, I form the upper portions of the rods of greater diameters than the bottom so that there will be a shoulder, as 26, to each 110 which makes a sliding fit with an enlarged portion, or socket, 25' of the respective hole.

27 are lugs secured to or made integral, with the rack members 17 and 17' for the purpose of holding the negatives in suitable position upon the rack. Extending
5 across the frame at the rear end and in proximity to the recess 7 is a rod 28 which has intermediate its length a finger 28' adapted when properly swung, by the partial rotation of the rod and through the
10 medium of a knob 28'', to engage the projection 11' of the spring 11 which holds the negative.

29 is a piece of flexible material to close the slot in the front wall of the frame when
15 the shutter 16 is withdrawn therefrom.

The operation of the invention may be described as follows: The negative holder 8 is first inserted in the frame with its edges in the recess 7'' and pressed downwardly
20 against the bottom face of the latter by the springs 9. The frame is then placed upon the top of the tray 14 containing a suitable developing mixture, whereupon the shutter 16 is withdrawn as is also the lower of the
25 slides 12 from the holder. A plate 10 is now exposed and is disengaged from the holder by giving a partial turn to the rod 28 so as to swing the finger 28' thereof against the projection 11' of the spring to
30 cause the spring to be receded from the plate and allow the latter to fall out of the holder and upon the rack when the whole apparatus together with the tray is tilted slightly toward the rear. The rack is then
35 lowered into the developing solution by pressing downwardly upon the bar 24 and brings the plate, which is borne upon the rack, into the solution. The plate is retained in the solution for a time sufficient to
40 effect the development of the negative, or picture, and according to the strength of the solution as well as the sensitiveness of the film upon the plate, after which the developed negative is withdrawn from the
45 solution by raising the rack through the medium of the rods 19 and 23 and the connected rod 24 to a height above the groove 16'. The shutter 16 is then replaced and the frame detached from the tray containing
50 the developer and transposed to a like tray containing a solution for fixing the negative. The shutter 16 is again removed and by partially rotating the rod 19 to swing the arm 19' into the position in
55 which it is indicated by broken lines in Fig. 1, the side member 17 of the rack is correspondingly retracted to occupy the position in which it is represented by broken lines in the same view and by such retraction of the side of the rack, the negative is
60 liberated and falls into the fixing bath, and thus completes the operation.

From the foregoing, it is evident that the operation of developing a negative may be

performed in the most exposed position as
65 regards light, there is no exposure of the plate to light during the entire process, and the operation is so simple that it can be manipulated by novices without fear of ruining the work. 70

The powders or salts for the solutions for use in the trays are obtainable in such uniform conditions as to strength that the solutions may be mixed with a fair knowledge as to efficiency and duration of action so
75 that there is practically no likelihood of failure through continuing the development for predetermined lengths of time and without scrutinizing the work.

The apparatus is not cumbersome nor
80 likely to become deranged even with rough usage and affords a valuable addition to the equipment of amateur or professional photographers where they are at distances remote from a "dark room". 85

Having described my invention, what I claim, is—

1. A developer comprising the combination with a plate-holder and a tray for containing a developing solution, of a frame
90 arranged to be placed upon the tray so as to prevent the passage of light therebetween, said frame being provided in proximity to its top with a receptacle for the holder, a rack arranged for vertical movement and
95 also adapted to be distended laterally, means to accomplish such vertical movement of the rack, and means to effect the distention thereof.

2. A developer comprising the combination with a plate-holder and a tray for containing a developing solution, of a frame
100 arranged to be placed upon the tray so as to prevent the passage of light therebetween, said frame being provided in proximity to its top with a receptacle for the holder, a shutter removably connected with the frame in proximity to the lower edge of the same, a rack arranged for vertical movements and
105 also adapted to be distended laterally, means to accomplish such vertical movements of the rack, and means to effect the distention thereof. 110

3. The combination with a frame provided in proximity to its top with a receptacle for
115 a plate-holder, a rack arranged for reciprocation so as to be moved into the frame or exteriorly and below the bottom edge thereof, means connected with the rack whereby such movements may be accomplished, means
120 whereby one side of the rack may be moved in a lateral direction toward or away from the other side, and means whereby a plate within the holder therefor may be disengaged from the holder so as to be deposited
125 upon the rack.

4. The combination with a frame provided in proximity to its top with a receptacle for

a plate-holder and a groove at the bottom to receive the edge of a tray, a removable shutter in proximity to the lower edge of the frame, a rack arranged for reciprocation so as to be moved into the frame or exteriorly and below the bottom edge thereof, means connected with the rack whereby such movements may be accomplished, and means whereby a plate within the holder therefor may be disengaged from the holder and deposited upon the rack.

5. The combination with a frame provided in proximity to its top with a receptacle for a plate-holder, and a groove at the bottom of said frame to receive the edge of a tray, a rack arranged for reciprocation so as to be moved into the frame or exteriorly and below the bottom edge thereof, means connected with the rack whereby such movements may be accomplished, means whereby one side of the rack may be moved in a lateral direction toward or away from the other side, and means whereby the plate within the holder therefor may be disengaged from

the holder so as to be deposited upon the rack. 25

6. The combination with a frame provided in proximity to its top with a receptacle for a plate-holder and a groove at the bottom to receive the edge of a tray, a removable shutter in proximity to the lower edge of the frame, a rack arranged for reciprocation so as to be moved into the frame or exteriorly and below the bottom edge thereof, means connected with the rack whereby such movements may be accomplished, means whereby one side of the rack may be moved in a lateral direction toward or away from the other side, and means whereby a plate within the holder therefor may be disengaged from the holder so as to be deposited upon the rack. 30 35 40

In testimony whereof I affix my signature in presence of two witnesses.

JOHN S. MILLER.

Witnesses:

HORACE BARNES,
ROBT. B. GILLIES.