J. S. GREENE.

PHOTOGRAPHIC DEVELOPING APPARATUS.

APPLICATION FILED DEC. 24, 1917.

1,261,926.

Patented Apr. 9, 1918.

2 SHEETS—SHEET 1.

Fig. 1

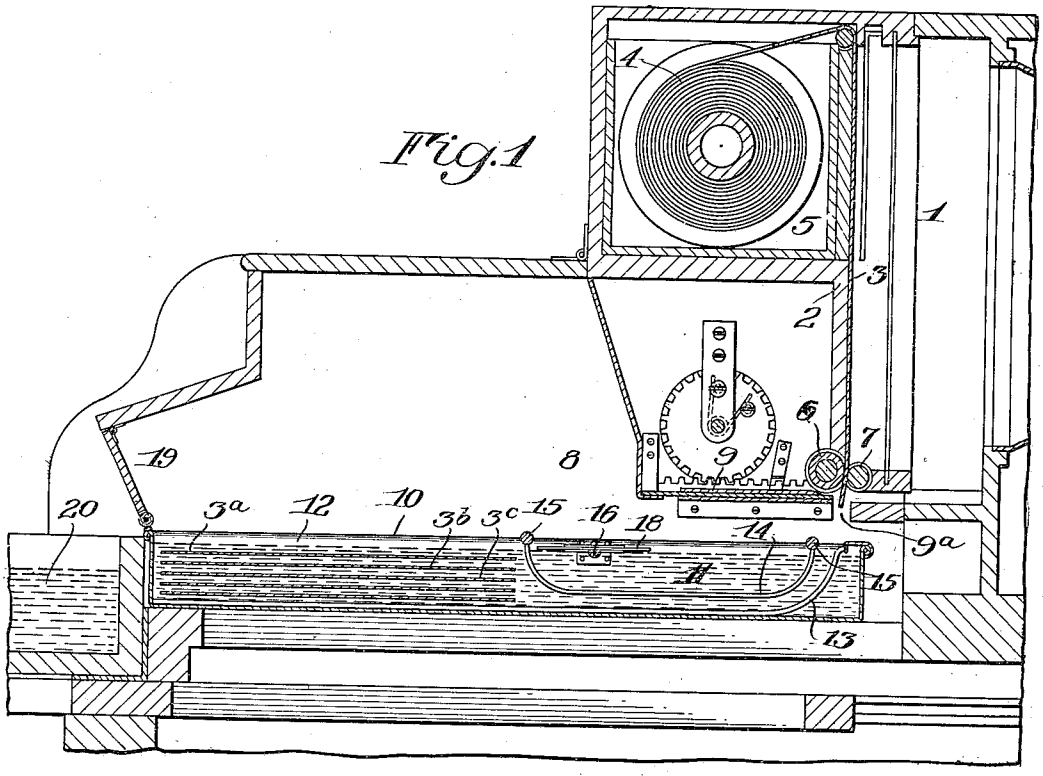
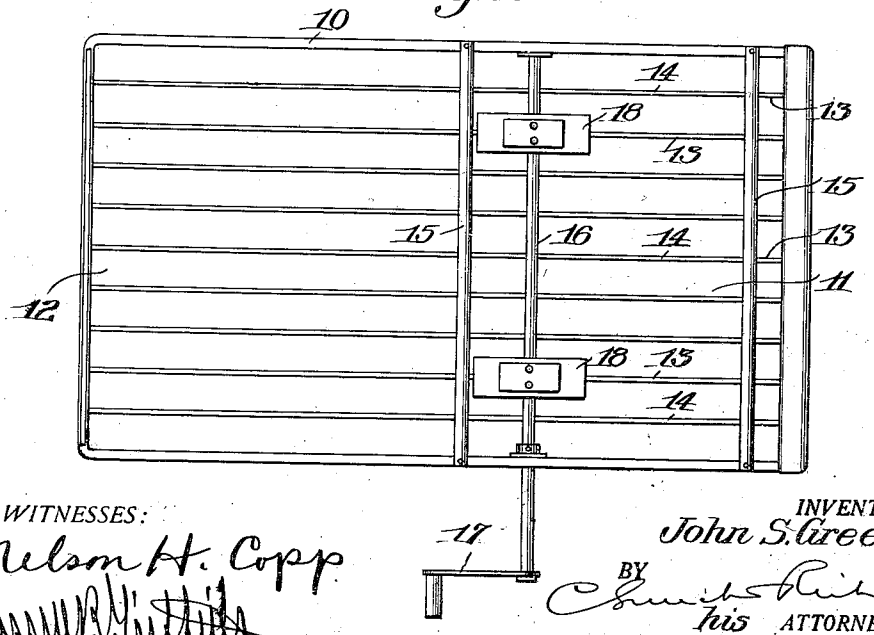


Fig. 2



WITNESSES:

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Fig. 3

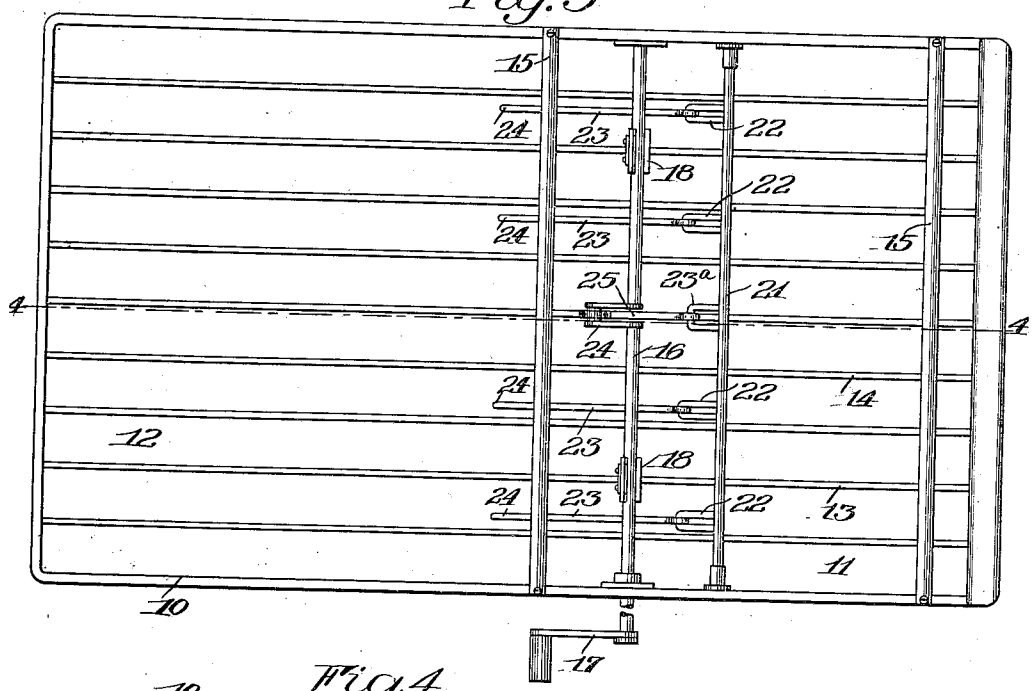


Fig. 4

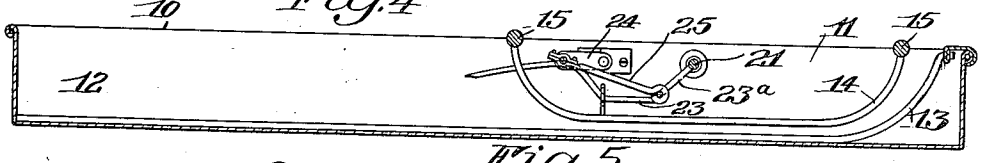


Fig. 5

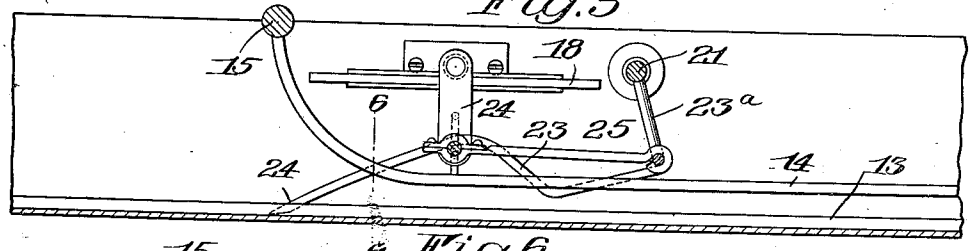
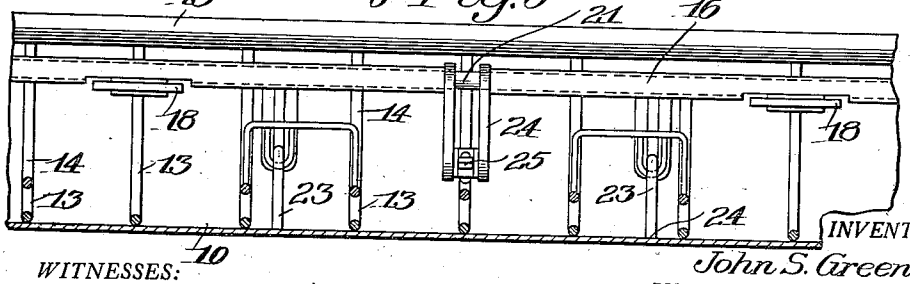


Fig. 6



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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC DEVELOPING APPARATUS.

1,261,926. Specification of Letters Patent. Patented Apr. 9, 1918.

Application filed December 24, 1917. Serial No. 208,544.

To all whom it may concern:

Be it known that I, JOHN S. GREENE, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Photographic Developing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to photography and more particularly to photographic developing apparatus of the kind used in connection with commercial cameras wherein a continuous sensitized strip is fed through the apparatus, exposed, severed and developed as a continuous process and the invention has for its object to provide a developing machine of simple construction and small proportions that will accommodate a large number of prints or severed sheets as rapidly as they can be fed from the exposing device and will deliver them in the order in which they have been exposed. 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:

Figure 1 is a longitudinal vertical sectional view through an exposing and developing apparatus constructed in accordance with and illustrating one embodiment of my invention, in its simpler form;

Fig. 2 is a top plan view of the developing tank;

Fig. 3 is an enlarged top plan view of the tank when fitted with additional features of my invention;

Fig. 4 is a longitudinal section through the tank taken substantially on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmentary section similar to Fig. 4 but showing the parts in different positions, and

Fig. 6 is a transverse section taken substantially on the line 6—6 of Fig. 5.

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

Referring first to Fig. 1, there is there shown portions of a camera comprising an exposure chamber 1 in rear of which is a wall 2 defining the focal plane and against which is supported for exposure a sheet 3 of sensitized material that is fed in a continuous strip from a roll 4 in a supply chamber 5. Feed rollers 6 and 7 at the bottom of the wall 2 and suitably operated, grip the strip and roll it downwardly into a developing chamber 8 past a reciprocatory knife 9 that severs the exposed area which is thereafter handled as a separate sheet. In the practice of my present invention, I arrange in the developing chamber 8 with its forward end below a slot 9^a through which the sheets are fed from the camera a developing tank 10. This tank may be said to be divided into a feed chamber 11 at its forward end and a float chamber 12 at its rear end. In the feed chamber 11 and extending from front to rear thereof in spaced relation are parallel curved wire guides 13 and 14 that receive the sheet as it emerges from the slot 9^a and direct it toward the bottom of the tank. The ends of the guides 14 of the submerging device are curved upwardly in the present instance and supported by bars 15 laid across the tank.

Spanning the tank above the feed chamber 11 is a transverse shaft 16 terminating in an operating crank 17 that is accessible from the exterior of the apparatus. Fixed to this shaft at intervals are two or more yielding paddles or wipers 18 that may be made of rubber strips and which graze the bottom of the tank or the guide wires 13 as the shaft is rotated. After the sheets have been thrust into the feed chamber by the rollers 6 and 7 and severed by the knife 9, they come under the influence of these paddles 18 which engage their upper surfaces as the crank 17 is operated and carry the sheets rearwardly along the bottoms of the chambers 11 and 12, finally depositing them in the chamber 12 in a flat condition. As each sheet arrives in the last mentioned chamber and escapes from the restraint of the submerging device 13—14 and of the paddles 18, it floats to the top of the body of developer and permits the next succeeding sheet to be delivered beneath it so that the accumulated sheets become piled up one above the other in the order in which they were exposed, the sheet last exposed always

going beneath. The float chambers 12 must give ample space for the sheets to rise naturally and in a flat condition toward the surface and in Fig. 1, they are lettered 3^a, 3^b, 3^c, etc., in the order in which they were exposed, severed and fed. Thus the operator can remove the sheets one at a time very readily from the exposure chamber 8 through a door 19 to transfer them to an adjacent washing or hypo bath at 20 as the case may be. In this way a great number of exposed sheets or prints can be accommodated and developed at the same time in a relatively small tank.

The sensitized material 3 is usually an emulsion film carried on a paper backing. Certain kinds of paper float more readily than others, the better grades usually being the most buoyant. Where a paper of low buoyancy is used, I sometimes find it necessary to assist its upward progress in the float chamber 12, particularly at its forward edge where it is necessary to make room for the advance of the succeeding sheet. To this end I may employ the additional devices illustrated in Figs. 3 to 6. A shaft 21 parallel with the shaft 16 and arranged forwardly of it carries a plurality of depending crank bearings 22 upon which are pivoted the forward ends of a plurality of inclined wire fingers 23, the rearward extremities 24 of which engage the bottom of the tank as shown in Fig. 5, just forwardly of the float chamber 12. Another crank journal 23^a on the shaft 21 is connected to a crank 24 on a shaft 16 by a connecting rod or link 25 so that as the shaft 16 is rotated, the shaft 21 is rocked. This carries the fingers 23 back and forth as the feeding paddles 18 rotate and as the fingers travel rearwardly, their extremities 24 raise the forward edges of the pile of sheets in the float chamber 12 and insure the passage of the sheet that is entering the float chamber beneath the pile. With this mechanism, working in unison with the feeding device, there is no opportunity for the sheets to get out of order or become crumpled in passing from one chamber to the other.

I claim as my invention:

1. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of means in the feeding chamber adapted to feed successive sheets edge-wise from the feeding chamber along the bottom of the float chamber.

2. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of a submerging device in the feeding chamber adapted to direct sheets along the bottom of both chambers as they pass from the feeding chamber to the float chamber.

3. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of a submerging device in the feeding chamber adapted to direct sheets along the bottom of both chambers as they pass from the feeding chamber to the float chamber, and a feeding device in the float chamber.

4. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of a flexible paddle device in the feeding chamber adapted to feed successive sheets edge-wise therefrom along the bottom of the float chamber.

5. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of means for feeding successive sheets edge-wise from the feeding chamber along the bottom of the float chamber and a lifting device adapted to raise the rear edge of the bottom sheet in the float chamber prior to the entrance into said chamber of the succeeding sheet.

6. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of means for feeding successive sheets edge-wise from the feeding chamber along the bottom of the float chamber and a lifting device adapted to raise the rear edge of the bottom sheet in the float chamber prior to the entrance into said chamber of the succeeding sheet, said device embodying a rock shaft and an inclined finger eccentrically connected thereto.

7. In a photographic developing apparatus, the combination with a fluid container having a feeding chamber and a float chamber, the latter adapted to accommodate sheets in a flat condition, of a rotary device for feeding successive sheets edge-wise from the feeding chamber along the bottom of the float chamber, a drive shaft for said rotary device, a rock shaft connected for movement to the drive shaft and inclined lifting fingers eccentrically connected to the rock shaft to raise the rear edge of the bottom sheet in the float chamber prior to the entrance into said chamber of the succeeding sheet.

8. In a photographic developing apparatus, the combination with an oblong developing tank having curved submerging guides extending along its bottom near one end, of a drive shaft spanning the tank, paddles thereon arranged to turn between the

submerging guides and feed photographic sheets along the bottom of the tank to the opposite end thereof, a rock-shaft spanning the tank and geared to the drive shaft and inclined lifting fingers eccentrically connected to the rock shaft and adapted to raise the rear edge of a sheet that has been fed beyond the submerging guides and feeding device and permit a succeeding sheet to be fed beneath it.

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Witnesses:
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