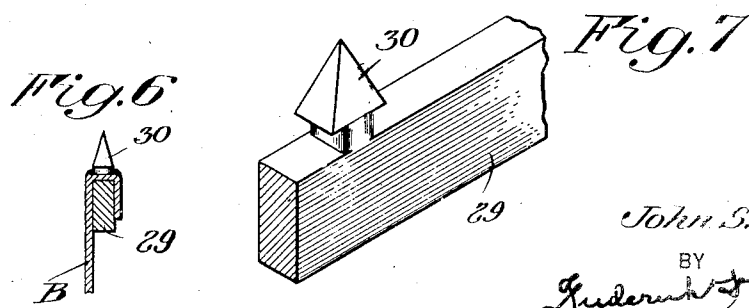
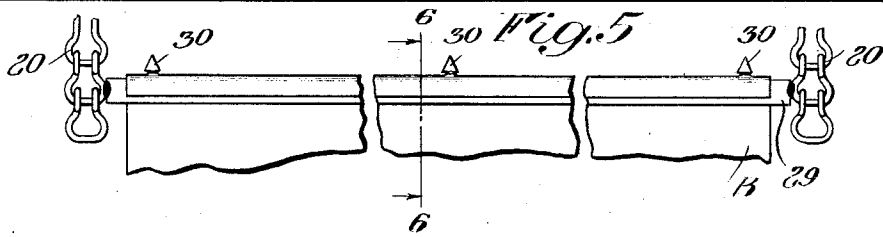
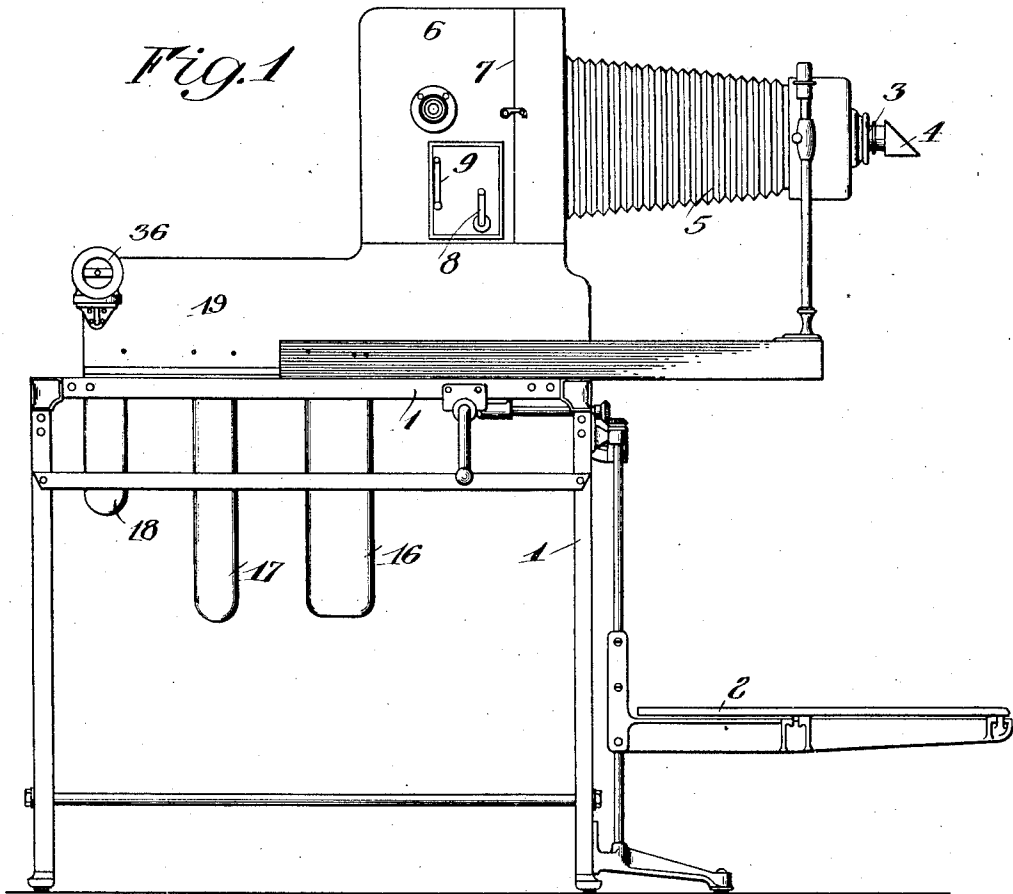


J. S. GREENE.
PHOTOGRAPHIC DEVELOPING APPARATUS.
APPLICATION FILED MAY 20, 1921.

1,421,079.

Patented June 27, 1922.
3 SHEETS—SHEET 1.

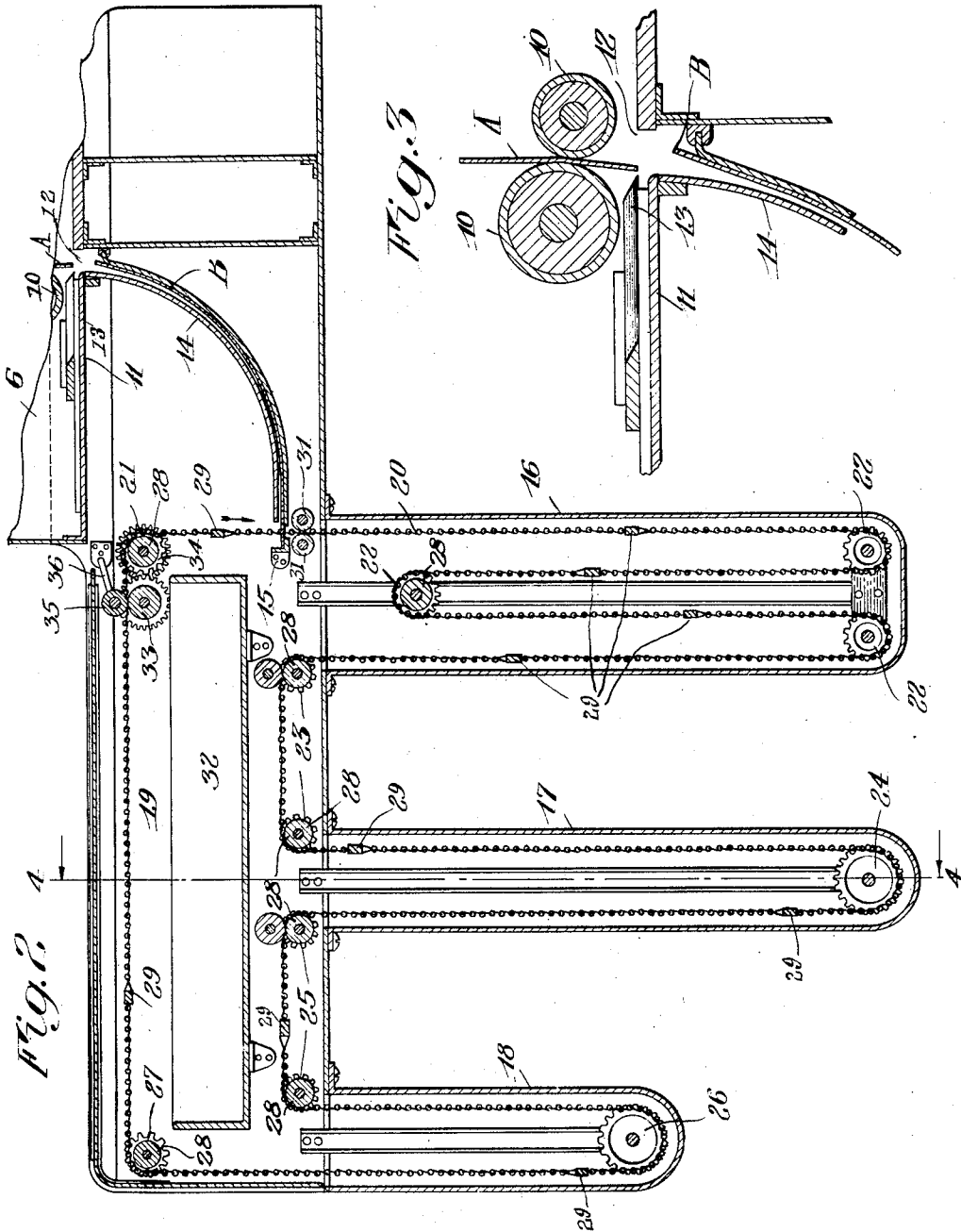


INVENTOR
John S. Greene
BY
Gudmund J. Church
his ATTORNEY

J. S. GREENE.
PHOTOGRAPHIC DEVELOPING APPARATUS.
APPLICATION FILED MAY 20, 1921.

1,421,079.

Patented June 27, 1922.
3 SHEETS—SHEET 2.



INVENTOR
John S. Greene

BY
Frederick G. Church
his ATTORNEY

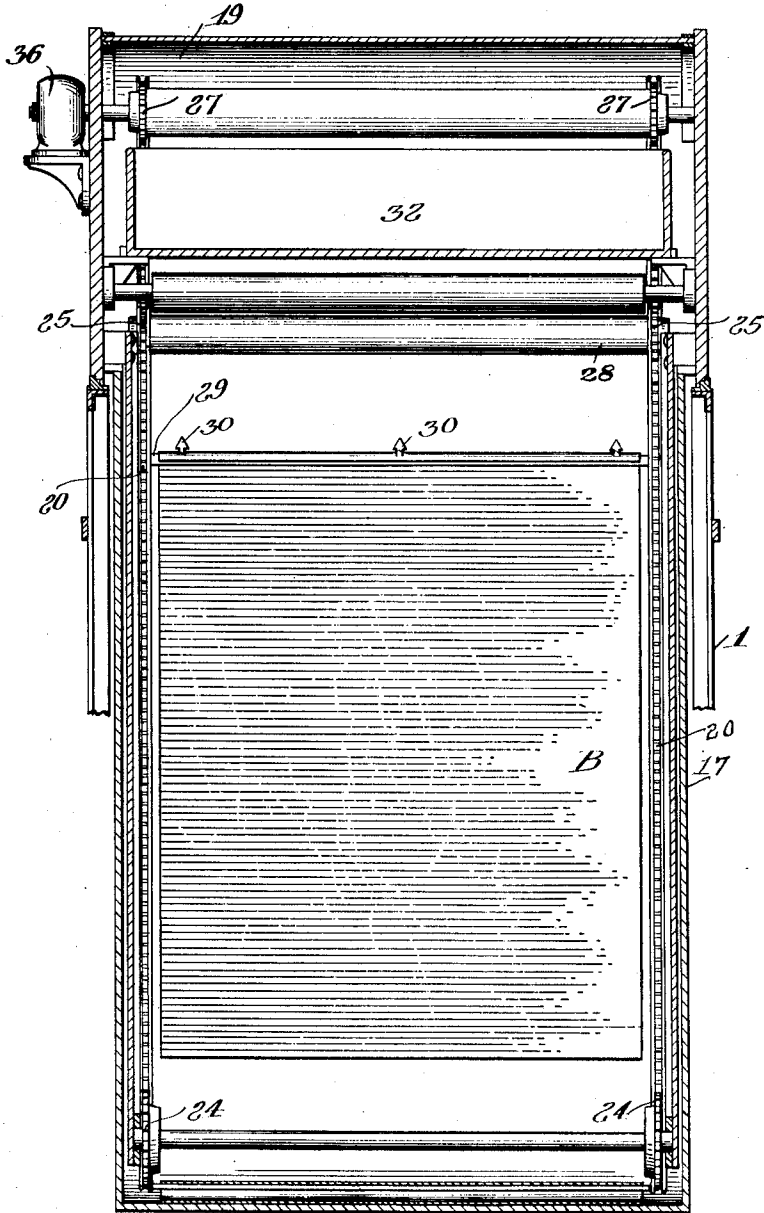
J. S. GREENE.
PHOTOGRAPHIC DEVELOPING APPARATUS.
APPLICATION FILED MAY 20, 1921.

1,421,079.

Patented June 27, 1922.

3 SHEETS—SHEET 3.

Fig. 4



INVENTOR
John S. Greene
BY
Frederick H. Church
his ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN S. GREENE, OF ROCHESTER, NEW YORK, ASSIGNOR TO PHOTOSTAT CORPORATION, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

PHOTOGRAPHIC-DEVELOPING APPARATUS.

1,421,079.

Specification of Letters Patent. Patented June 27, 1922.

Application filed May 20, 1921. Serial No. 471,092.

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 machines for developing photographic prints, and it has for its object to provide a simple, economical and durable apparatus of this nature which may be used to advantage associated with what is known as the commercial or copying type of camera to receive the prints therefrom immediately after exposure and automatically conduct them in an improved manner through the various required baths. The improvements are directed in part toward the means for catching and carrying the prints and toward means for releasing them automatically and depositing them when the treatment has been completed. To these and other ends the invention consists 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 side elevation of a copying camera of known type fitted with a developing apparatus constructed in accordance with and illustrating an embodiment of my invention;

Figure 2 is an enlarged central vertical longitudinal section through the developing apparatus and showing a fragment of the cooperating camera mechanism;

Figure 3 is an enlarged fragmentary section through the print feeding mechanism of the camera;

Figure 4 is an enlarged transverse section on the line 4-4 of Figure 2 looking in the direction of the arrows;

Figure 5 is an enlarged fragmentary detail view of one of the print carrying devices of the conveyor;

Figure 6 is a section on the line 6-6 of Figure 5, and

Figure 7 is a fragmentary perspective of one of the print impaling members.

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

As before stated, the camera in connection with which I have illustrated my invention is of a familiar commercial type comprising generally a stand or table 1 having a vertically adjustable copying board 2 mounted thereon to support the papers or other articles to be copied in the focus of a lens system 3 which, through the provision of a prism 4, projects the image through bellows 5 into the camera body 6 carried on the stand 1. The focal plane of the camera is approximately indicated by the dividing line 7 (shown in Figure 1) between the separable parts of the camera body. As is well known, this type of camera feeds a strip of film or sensitive paper from a roll at the top downwardly through the focal plane and, as each area is exposed on the continuous strip, it is fed downwardly and severed into an individual sheet or print while a new area is being drawn into the focal plane.

The feeding and severing devices (operated respectively by cranks 8 and 9 in Figure 1) are partially shown in Figures 2 and 3, and the former embodies a pair of rolls 10 between which the film or paper A is drawn. They are located transversely above and adjacent to the floor 11 of the camera body 6 which floor is provided with a discharge slot or opening 12 directly beneath the rolls to receive the sensitive material that has been exposed and wound through. A suitable severing device embodying a knife 13 between the rolls and the floor 11 cuts the strip as indicated in Figure 3 and deposits the individual print B in a chute 14 ready for development.

In the practice of my present invention I arrange this chute, guide or conductor 14 between the side rails of the stand 1 below the camera floor 11 and form it in a downward and rearward curve as shown in Figure 2 so that its rear end is disposed substantially horizontally. Spaced slightly from its mouth and in alinement with it is a stop 15 consisting in the present instance of an angle iron extending across between

the rails of the stand. The advancing edge of the print B, issuing from the conductor 14, is halted temporarily by this stop in the position shown in Figure 2.

5 The said stop 15 is arranged above the mouth of a vertically arranged tank 16 carried by and depending from the under side of the stand 1. There are three of these tanks in the present instance, similarly
10 formed and arranged and spaced progressively toward the rear of the apparatus. The first one, 16, referred to, contains the developing solution, the second one, 17, a hypo solution and the third one, 18, the water
15 bath. A conveyor (that may be composed of any suitable flexible element) travels progressively and endlessly through these tanks within a closed developing chamber 19 suitably formed on the stand 1 in rear of the camera 6. It consists in the present instance
20 of two side chains 20 that travel downwardly at the sides of the tanks and extend from upper sprockets 21 to sprockets 22 within tank 16 which loop the conveyor as shown
25 if desired; upwardly over sprockets 23 in chamber 19 and downwardly into tank 17 around sprockets 24 in the latter; upwardly over sprockets 25 similar to sprockets 23; into tank 18 around sprocket 26 therein;
30 thence upwardly out of the tanks over another upper sprocket 27 and horizontally back to sprocket 21. The sprockets are mounted on the various transverse shafts shown in Figure 2 which shafts carry rollers
35 28 where not immersed in the tanks to support the prints as they are dragged along in the manner about to be described.

The individual side chains of the conveyor are connected at intervals by cross members
40 in the present form of bars 29, best shown in Figures 5, 6 and 7, which are secured at their ends to the respective chains. Each bar is provided with a plurality of impaling devices 30 having the present form of barbed
45 spurs or pins. They are located on the under sides of the bars as they travel downwardly from sprocket 21 into the first tank and the parts are so arranged that the bars pass between the mouth of the chute or conductor 14 and the stop 15. The prints B in
50 the described position of Figure 2 project between the side chains 20 and their margins adjacent to the stop lie in the path of the bars being supported on both sides by
55 the stop and the chute respectively. The result is that the impaling devices 30 pierce the dry edge of the print at a normal angle and catch and carry it downwardly out of the chute 14 and between rolls 31 into the
60 first tank 16. The print is thus dragged through the successive tanks along the path of the conveyor and given the desired successive immersions or baths.

When the print emerges from the last
65 tank 18 and is carried over the last upper

roll (of sprockets 27) it may be removed and given final washing or other treatment by hand, but I prefer to provide a final hypo or other bath in a horizontal tank or tray 32 arranged in chamber 19 above the other
70 tanks. The print is so delivered in a position above this tank or tray 32 and I provide means for automatically releasing it from the impaling devices of the cross members so that it will fall into this tray. This
75 means consists in the present instance of a lower roll 33 at the forward end of tray 32 and adjacent to the roll 28 of sprockets 21 from which it is driven in the opposite direction by gearing 34, in combination with
80 an upper yielding idle roll 35 mounted to swing on carrying links 36 pivoted to the sides of the stand. When the cross bar 29 carrying a print that is trailing over tray 32 reaches roller 33 it lifts and rides beneath
85 roller 35 and continues on over sprocket 21 and its roll 28. Roller 35, however, immediately drops back on roll 33 by gravity which is the equivalent of spring action and confines the print 13 between itself and the
90 surface of roll 33. As such surface is traveling rearwardly or in the reverse direction from the conveyor, this halts the print and tends to feed it backwards between the rolls. The result is that the margin of the wet
95 print is torn from the impaling devices 30 and the print falls between the chains into tray 32. As this advance edge of the print that is torn carries no part of the image or picture, having been between feed rolls 10
100 during the exposure, there is no objection to tearing it.

As shown in Figure 4, the conveyor of the apparatus may be driven by an exteriorly
105 arranged motor 36 having a driving connection with any one of the sprocket shafts.

I claim as my invention:

1. In a photographic developing apparatus, the combination with a tank, of a conveyor movable downwardly into said tank,
110 means for feeding prints to said conveyor from a relatively transverse direction and impaling devices on the conveyor adapted to catch and carry the prints.

2. In a photographic developing apparatus, the combination with a tank, of a conveyor movable downwardly into said tank,
115 means for feeding prints to said conveyor from a relatively transverse direction, a stop for positioning the prints with reference to
120 the conveyor and impaling devices on the latter adapted to catch and carry the prints.

3. In a photographic developing apparatus, the combination with a tank, of a conveyor movable downwardly into said tank
125 and comprising flexible side members and cross members connecting them, means for feeding prints to said conveyor from a relatively transverse direction and between the side members thereof, and impaling devices
130

on the cross members adapted to catch and carry the prints.

4. In a photographic developing apparatus, the combination with a tank, of a conveyor movable downwardly into said tank and comprising flexible side members and cross members connecting them, and provided with impaling devices, means for feeding prints to said conveyor from a relatively transverse direction and between the side members thereof and a stop for positioning the print with reference to the conveyor to cause the impaling devices to catch it at the margin thereof and carry it into the tank.

5. In a photographic developing apparatus, the combination with a lower tank and an upper tank, of an endless conveyor movable downwardly into the lower tank and thence across the top of the upper tank, means on the conveyor for catching and carrying a print, means for feeding prints thereto previous to the entrance of said means into the lower tank and means for automatically releasing the print therefrom as the latter is carried over the upper tank.

6. In a photographic developing apparatus, the combination with a lower tank and an upper tank, of an endless conveyor movable downwardly into the lower tank and thence across the top of the upper tank, means on the conveyor for catching and carrying a print, means for feeding prints

thereto previous to the entrance of said means into the lower tank and means for automatically releasing the print therefrom as the latter is carried over the upper tank comprising rollers between which the print passes, said rollers being driven in a direction opposite to that of the print and conveyor.

7. In a photographic developing apparatus, the combination with a tank, of a conveyor provided with impaling means for catching and carrying a print on the tank and means for gripping the print during the travel of the conveyor to tear it from the impaling means and drop it into the tank.

8. In a photographic developing apparatus, the combination with a tank, of a conveyor movable across the same and comprising flexible side members and cross members connected thereto and provided with impaling devices adapted to catch and carry a print, a roll between the side members over which the print is adapted to pass, a second roll cooperating with the first and adapted to be displaced by the cross members to introduce the prints carried by the latter between the rolls, and means for driving the rolls in a direction opposite to that of the print and conveyor to detach the print from the impaling devices and drop it into the tank.

JOHN S. GREENE.