

No. 609,677.

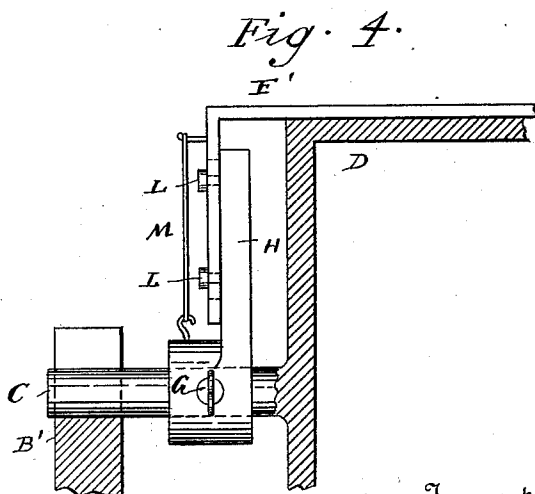
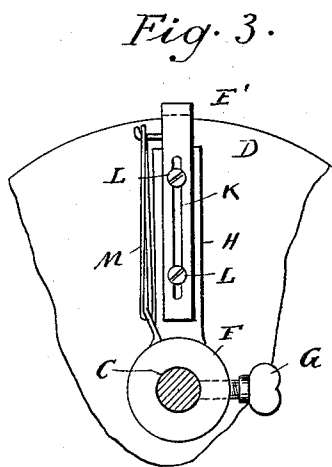
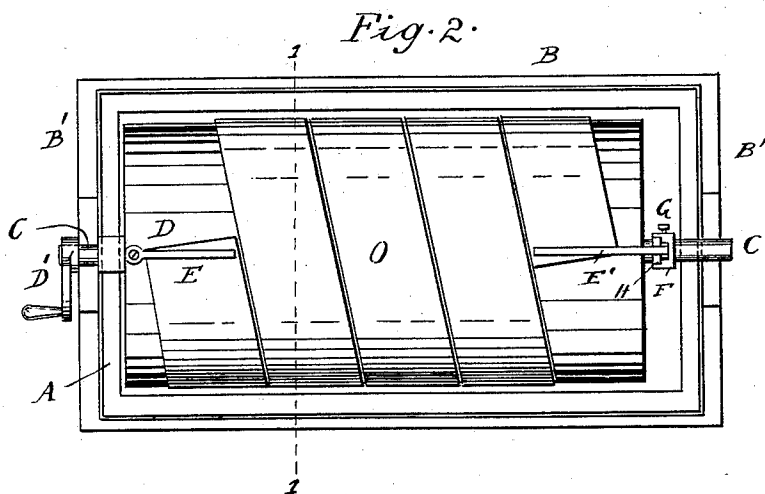
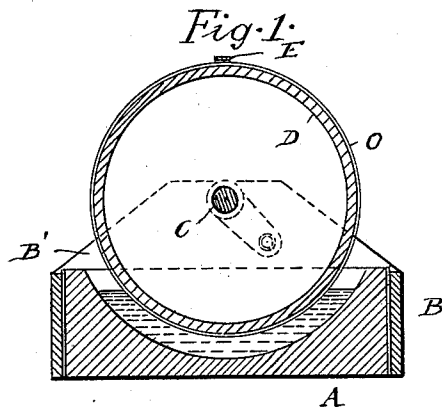
Patented Aug. 23, 1898.

J. S. JOHNSTON.

APPARATUS FOR DEVELOPING PHOTOGRAPHIC FILMS.

(Application filed Oct. 7, 1897.)

(No Model.)



Witnesses
Peter Albertine Jr.
C. H. Boaz

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 By his Attorney
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UNITED STATES PATENT OFFICE.

JOHN S. JOHNSTON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
FRANK SACHSE, OF SAME PLACE.

APPARATUS FOR DEVELOPING PHOTOGRAPHIC FILMS.

SPECIFICATION forming part of Letters Patent No. 609,677, dated August 23, 1898.

Application filed October 7, 1897. Serial No. 654,322. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. JOHNSTON, a citizen of Great Britain, and a resident of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Apparatus for Developing Photographic Films, of which the following is a specification.

This invention relates to improvements in apparatus for developing photographic films on which a series of negatives have been produced.

Heretofore it has been customary to cut such films into as many sections or parts as there were negatives on it and to develop, fix, and wash each section or negative separately, which method consumes much time, is laborious, and requires a frequent handling of the films, whereby they are apt to be injured and broken.

The object of my invention is to provide a new and improved apparatus for developing all the negatives on a photographic film at once and without requiring cutting or subdividing of the film and in such a manner that the film need not be handled, and thus is not apt to be damaged, torn, or broken, and whereby much valuable time is saved and better results produced.

In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate like parts in all the views, Figure 1 is a vertical transverse sectional view through my improved apparatus for developing photographic films on the line 1 1 of Fig. 2. Fig. 2 is a plan view of the same. Fig. 3 is a detail end view of part of the cylinder. Fig. 4 is a detail vertical longitudinal sectional view of one end part of the cylinder.

The trough or tray A for receiving the developing solution or fixing-bath is rounded on the upper surface of its bottom, as shown, although this is not absolutely necessary.

A frame B of such size as to fit quite snugly around the trough or tray A is provided in the upper edge of each of its end pieces B' with a bearing for a shaft C, on which a drum or cylinder D is secured, which is of such length and diameter that it can be placed

within the trough or tray A and rotated in the same, the cylinder or drum dipping into the liquid in the tray or trough.

The shaft C is provided with a crank-handle D' or equivalent device for turning it.

A spring-clamp E is applied on the circumferential surface of the drum D at each end, and said clamps may be of any approved construction; but I prefer to form them of a strip of spring material—such as, for example, hard rubber—which is attached at one end to the circumference of the drum. As it is very convenient to have one of the clamps adjustable and this better adapts the device for films of different lengths, I provide a loose collar F on the shaft C at one end, and said collar has a binding-screw G for locking it on the shaft, and from said collar an arm H projects.

The clamp E' is made rectangular in shape and is mounted to slide on the arm H in such a manner that one arm of the clamp projects over the circumferential surface of the drum, the other arm being provided with a longitudinal slot K, through which screws L pass into the arm H to guide the clamp.

A rubber spring M is attached to the clamp E' and the collar F and serves to press that arm of the clamp E' extending over the drum down on the circumferential surface of the same.

To develop and fix the negatives on a film, one end of the film O is placed under the permanent clamp E on the cylinder with the sensitive face outward and the cylinder is turned, whereby the film is wound on the drum spirally, as shown, and then the other clamp E' is raised and the end of the film placed under it and the said clamp E' released, whereby the film is held on the cylinder. The frame B, with the drum D and the film O thereon, is then placed over a tray or trough A, containing the developing solution, so that the cylinder dips into the solution and the cylinder is slowly rotated until the negatives on the film are sufficiently developed. The drum is then removed and the film washed either by dipping the drum into a vessel containing water or by rotating the drum in another tray or trough containing

clean water, and then the frame B and drum D, with the film thereon, is placed over a trough or tray containing a fixing solution and the drum is rotated until the negatives
 5 are fixed. The drum with the film thereon is then placed into a suitable vessel containing running water or a vessel the water in which is frequently changed until the film is thoroughly washed. The film is then per-
 10 mitted to dry on the drum and when dry is unwound from the drum. The film can thus be developed very rapidly without requiring any handling of the film after it has been wound on the drum, and there is thus no dan-
 15 ger of injuring the film or breaking or tearing it.

The clamp E' can easily be adjusted so that it will be at that part of the drum at which the end of the film comes, all that is
 20 necessary being to loosen the screw G and to turn the arm H until the clamp E' thereon is in the proper position.

If desired, an endless rubber band may be applied lengthwise on the drum before the film
 25 is wound on and the ends of the film inserted below said band; but I prefer to use clamps such as shown.

Having described my invention, what I claim as new, and desire to secure by Letters
 30 Patent, is—

1. An apparatus for developing photographic films, consisting of a drum on which the film can be wound and means for holding the film on the drum, substantially as herein
 35 shown and described.

2. In an apparatus for developing photographic films, the combination with a drum on which the films can be wound and means for mounting said drum over a trough con-
 40 taining a solution and for rotating said drum

while immersed in the solution, substantially as herein shown and described.

3. In an apparatus for developing photographic films the combination with a drum on which the films can be wound, of an open
 45 frame having bearings for said drum to adapt rotating the drum on its axis, which frame fits over a trough for receiving a liquid, substantially as herein shown and described.

4. In an apparatus for developing photo-
 50 graphic films, the combination with a drum, on which the films can be wound, of clamps on the end parts of the drum for holding the ends of the films on the drum, substantially as herein shown and described.

5. In an apparatus for developing photo-
 55 graphic films, the combination with a drum, on which the films can be wound, of a clamp adjustable circumferentially on the end part of the drum, substantially as herein shown
 60 and described.

6. In an apparatus for developing photographic films, the combination with a drum, of a collar mounted loosely on the shaft of the drum at one end of the latter, an arm on said
 65 collar, a sliding clamp on said arm, extending over the circumferential surface of the drum and a spring acting on said clamp to press it toward the circumferential surface of the drum, substantially as herein shown and de-
 70 scribed.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of September, 1897.

JOHN S. JOHNSTON.

Witnesses:

OSCAR F. GUNZ,
 P. ALBERTINE, Jr.