

No. 659,498.

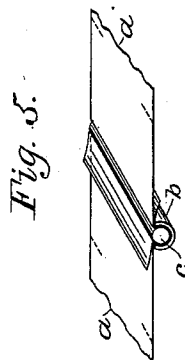
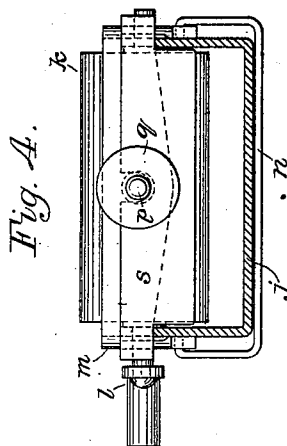
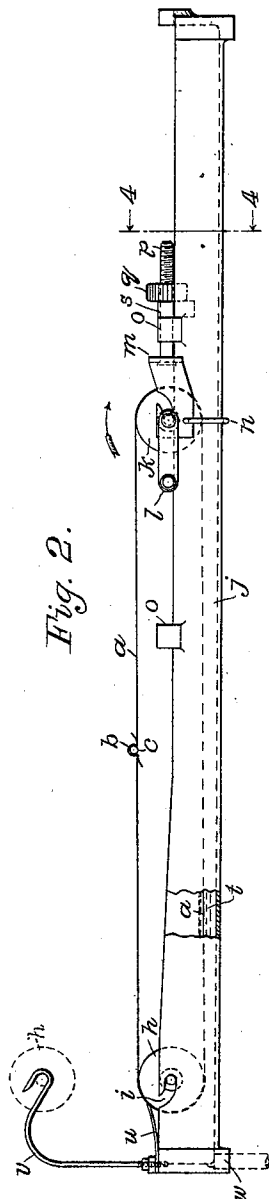
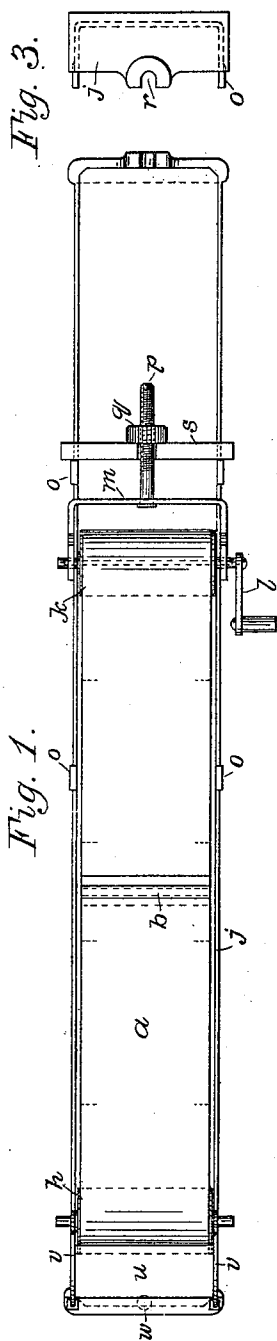
Patented Oct. 9, 1900.

C. TRAXLER.
PHOTOGRAPHIC FILM DEVELOPING APPARATUS.

(Application filed Aug. 29, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,
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Frank Miller.

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2 Sheets—Sheet 2.

Fig. 6.

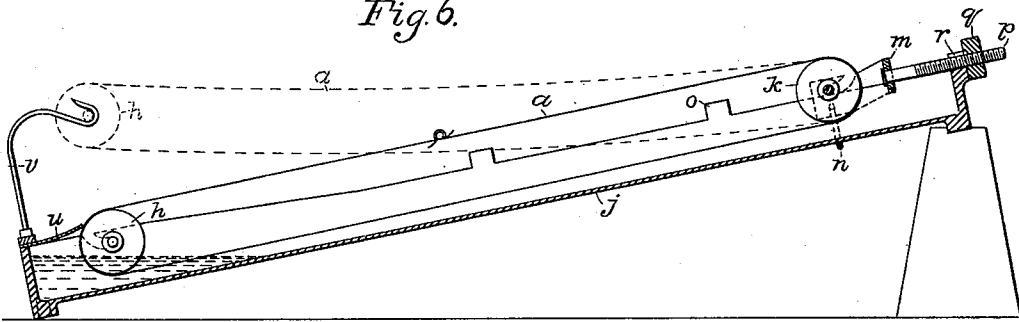


Fig. 7.

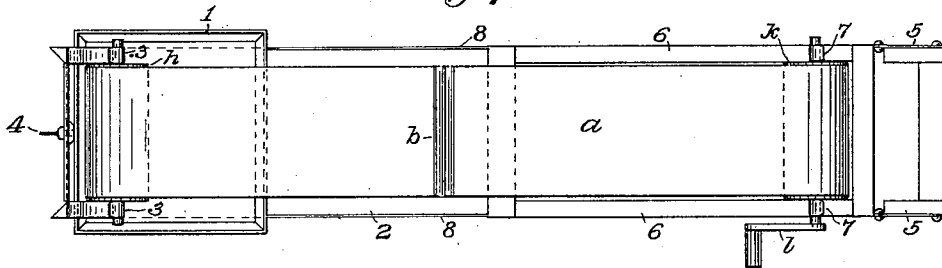
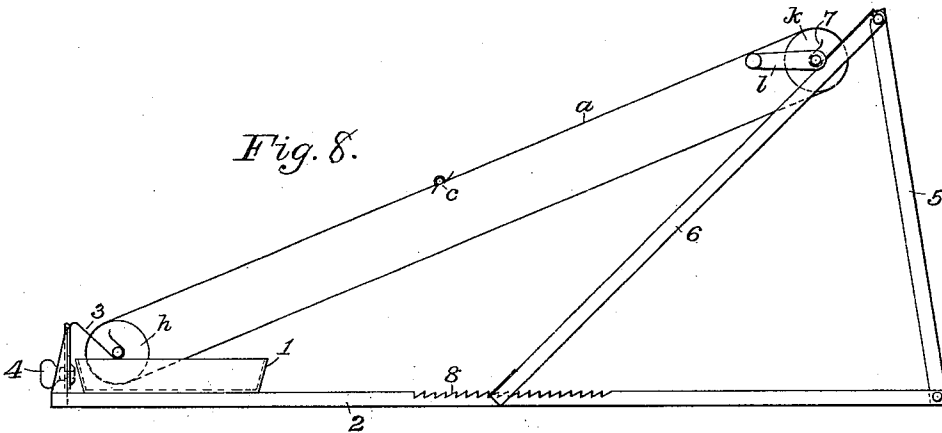


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES TRAXLER, OF AKRON, OHIO, ASSIGNOR OF TWO-FIFTHS TO
JOSEPH DANGEL AND EDWARD D. EDWARDS, OF SAME PLACE.

PHOTOGRAPHIC-FILM-DEVELOPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 659,498, dated October 9, 1900.

Application filed August 29, 1899. Serial No. 728,873. (No model.)

To all whom it may concern:

Be it known that I, CHARLES TRAXLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Apparatus for Developing Photographic Films, of which the following is a specification.

My invention relates to improvements in apparatus employed in the development of negatives upon sensitized transparent films which have previously been exposed to light in a properly-constructed camera, and is designed especially for developing a strip of film upon which several consecutive exposures have been made.

My object is to provide apparatus of this class which will develop the full length of a roll of film as taken from a camera, thereby avoiding the danger of ruining exposed portions by cutting into them when endeavoring to separate them one from another before the pictures are visible or of spoiling the end pictures of the roll by handling when they are not cut apart; also, by means of my apparatus the annoying tendency of the films to curl up at the ends is prevented. Half of the pictures being always in full view of the operator, the progress of the developing process may be closely watched, and a great saving of time is effected.

To these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, an embodiment thereof being illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the apparatus, and Fig. 2 is a side elevation of the same. Fig. 3 is an elevation of the rear end of the tray. Fig. 4 is a sectional elevation taken on line 4 4 of Fig. 2. Fig. 5 is a perspective view showing the ends of the film fastened together by the clamp. Fig. 6 is a longitudinal section showing the rear end of the tray elevated. Fig. 7 is a plan view, and Fig. 8 is a side elevation of a modified form of the apparatus.

The reference-letter *a* indicates a strip of film which has been exposed to light in a photographic camera and from which it is desired to make negatives by treating it with a chemical solution in a dark room for a proper

length of time and then washing with water and drying it. The usual practice is to cut the strip apart between the pictures at the points indicated by the dotted lines in Figs. 1 and 5; but as these lines do not appear upon the film itself, and as the pictures are not visible before being treated with the solution, it is difficult to separate the pictures without cutting into them. Another way is to develop the entire strip in an ordinary tray; but this method necessitates handling the ends of the strip, thereby often spoiling the end pictures. To obviate these difficulties, I have devised a spring-clamp to fasten the ends of the strip rigidly together, which can readily be affixed while the film is dry without danger of injuring the pictures, thus making a continuous belt of the film, which may be run smoothly over rolls. The clamp consists of a spring-piece *b*, shaped like a hollow cylinder, with a portion of one side cut away, and a cylindrical mandrel *c*, around which the ends of the film are turned when it is forced into the hollow spring-piece *b*, as plainly shown in Fig. 5. The film is then passed around an idler pulley or roll *h*, having journals at each end, adapted to revolve freely in the hook-shaped notches *i* in the sides of the tray *j*. A similar roll *k*, provided with a crank *l* or other suitable means for turning it, is placed in the opposite bight of the film-belt, and its journals are inserted in hook-shaped notches in the ends of the yoke *m*, which extends across the tray and overlaps the sides thereof, so that the journals of the driving-roll, while being held against the tension of the belt by the yoke, are also supported by the sides of the tray. A bent rod *n*, connected freely to the yoke at each end and passing under the tray, serves to hold the roll down; but the roll being removed the yoke may be revolved forward on the pivotal ends of rod *n*, so as to clear the projecting stops *o* on the sides of the tray, the purpose of which stops is to provide for varying lengths of film. Extending rearwardly from the middle of said yoke is a tension-bolt *p*, threaded to receive a thumb-nut *q*. When the full length of film is to be developed, said bolt is dropped into the groove *r*, and the tension-nut bears against the end of the tray, as shown in Fig. 6; but when

shorter lengths of film are used a cross-piece *s*, having a groove for the bolt and ends projecting over the sides of the tray, is placed against the rear faces of a pair of the stops *o*, as in Figs. 1, 2, and 4. The tray is partly filled with developing solution, as shown at *t*, Fig. 2, and the driving-roll is revolved in the direction shown by the arrow, which, while keeping the fluid constantly agitated and one-half of the film immersed, the upper half of the film is in plain view of the operator. A wiper *u*, of felt or similar light and soft material, may be fastened to the front of the tray with its rear edge bearing against the film on the idler-roll to keep back surplus solution. Hangers *v* are provided to hold the idler-roll when it is desired to raise the film out of the tray for drying it or any other purpose. The tray is also provided with an outlet *w*, which may be used to draw off the chemical solution; but its main purpose is to discharge water which is allowed to run into the opposite end of the tray when the apparatus is used for washing the solution from the film.

When it is found that some pictures on the film are slower in developing than others, the tray may be elevated at its rear end, as in Fig. 6, and the slow pictures worked back and forth in the solution at the lower end.

While I prefer the apparatus as hereinbefore described, modifications may be made whereby some of the parts may be dispensed with and cheaper devices substituted in their place without departing from the leading principles of my invention. One such form is shown in Figs. 7 and 8, in which an ordinary tray 1 is used in connection with the endless film-belt and the rolls, as before described. A light frame 2 is provided with adjustable hangers 3 3 for the idler-roll, which may be moved upward or downward and clamped in desired position by the thumb-screw 4. Hinged to the opposite end of the base-frame is an upright frame 5, to the top of which is hinged a diagonal frame 6, carrying near its upper end hangers 7 7 for the driving-roll. Notches 8 are made in the base-frame to engage the bottom edge of the diagonal member 6, by means of which the proper tension may be produced in the film-belt.

The material of which the trays, rolls, and other parts liable to come into contact with the solution are made should be acid-proof. Hard rubber is preferable, but japanned metal or wood or other materials which the solution will not affect may be employed.

Having described the application of my in-

vention as above, what I claim as new, and desire to secure by Letters Patent, is—

1. In a photographic developing apparatus, a driving-roll adapted to carry a film-belt and to which power may be applied, an idler-roll rotated by said belt, said rollers serving both to support and actuate said belt, suitable open-ended bearings in or attached to a tray for the journals of said rollers, means for adjusting the distance between the two rollers to suit varying lengths of film, and a tray for developing solution in which the film-belt may run, substantially as set forth.

2. In apparatus for developing photographic films, the combination of an idler-roll and a driving-roll adapted to carry a belt formed by joining the ends of a strip of sensitized film, an approximately-rectangular tray for developing solution of sufficient length and depth to receive said belt, having suitable bearings for the journals of one of said rolls in its sides near its front end, and provided with oppositely-registering pairs of lugs projecting above its sides, a yoke extending across the tray having at each end suitable bearings for the journals of the other one of said rolls, and means for holding the yoke to the tray, a tension-bolt carrying a nut and attached to the middle of the yoke, and a cross-piece adapted to engage said bolt and provided with projecting ends supported upon the sides of the tray and bearing against the lugs thereon, substantially as set forth.

3. In apparatus of the class described, the combination of an idler-roll and a driving-roll adapted to carry a continuous belt of film, a tray for developing solution of a suitable length and depth to receive said belt and rolls, and provided with hook-shaped notches in its sides near its front end fitted to receive the journals of one of said rolls, oppositely-registering pairs of stops on the sides of said tray, a yoke extending across the tray having at each end hook-shaped notches to receive the journals of the other one of the said rolls, a bent rod passing under the tray and pivotally secured at each end to the ends of the yoke, a tension-bolt attached to the middle of the yoke and provided with a nut, and a cross-piece adapted to receive said bolt having projecting ends to engage the stops on the sides of the tray, substantially as set forth.

In testimony whereof I affix my signature, in the presence of two subscribing witnesses, at Cleveland, Ohio, August 25, 1899.

CHARLES TRAXLER.

Witnesses:

GEORGE B. RILEY,
L. G. HOPPER.