

1,031,459.

Patented July 2, 1912.
 2 SHEETS-SHEET 1.

Fig. 1.

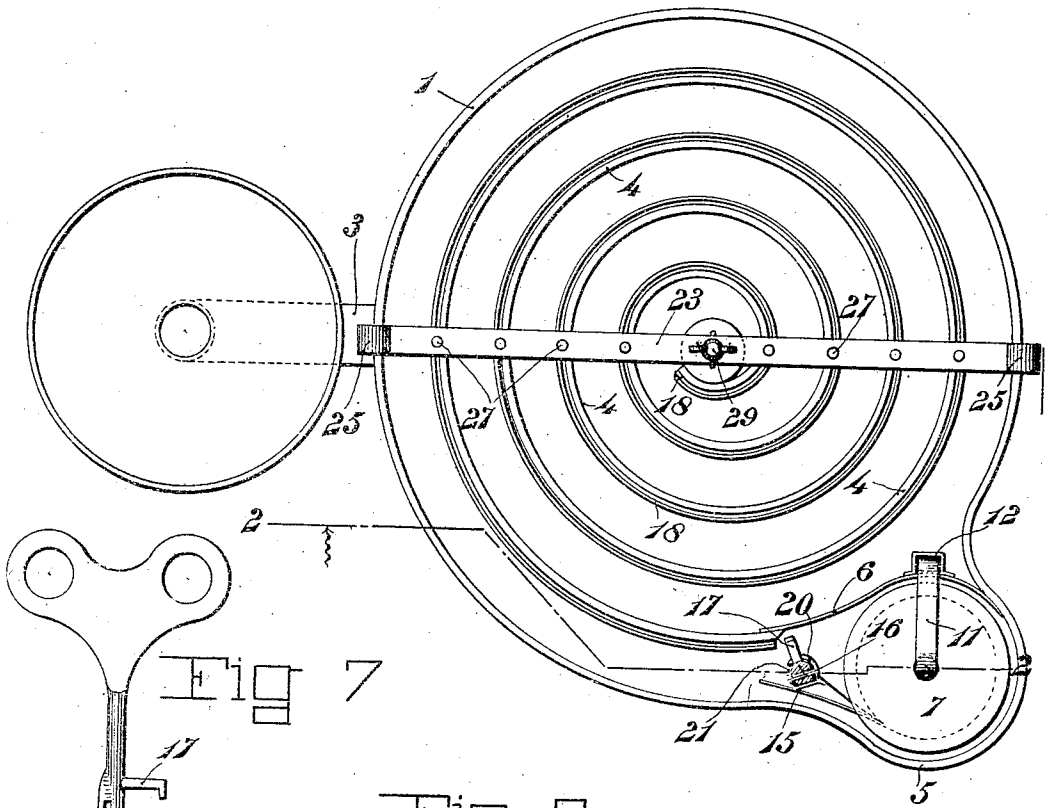


Fig. 7

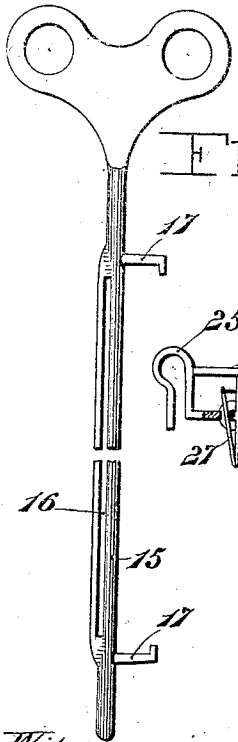


Fig. 8

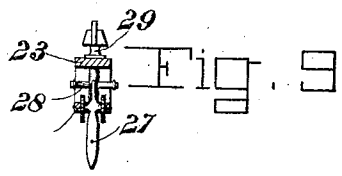
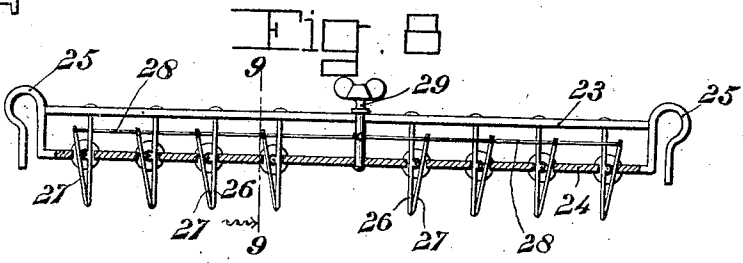


Fig. 9

Fig. 10



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2 SHEETS-SHEET 2.

Fig. 2.

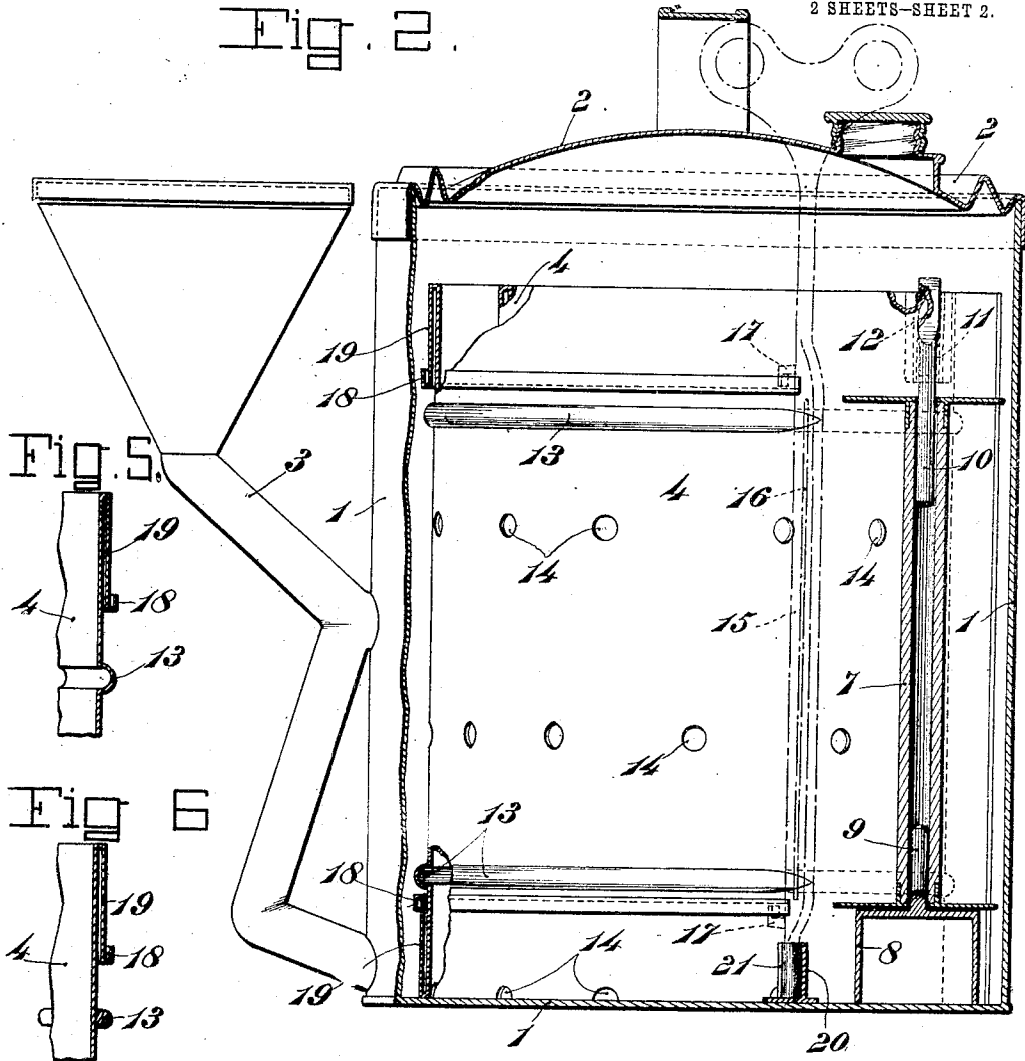


Fig. 5.

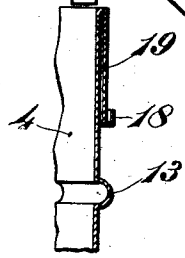


Fig. 6.

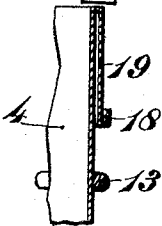


Fig. 4.

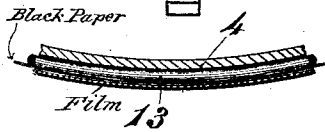
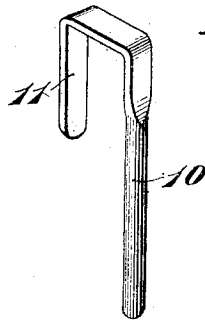


Fig. 3.



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UNITED STATES PATENT OFFICE.

FREDERICK FRANCIS NYČ, OF KERRVILLE, TEXAS.

FILM DEVELOPING, FIXING, AND WASHING APPARATUS.

1,031,459.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed September 5, 1911. Serial No. 647,633.

To all whom it may concern:

Be it known that I, FREDERICK F. NYČ, a citizen of the United States, residing at Kerrville, in the county of Kerr and State of Texas, have invented new and useful Improvements in Film Developing, Fixing, and Washing Apparatus, of which the following is a specification.

This invention relates to improvements in combined film developing, fixing, and washing apparatus, more particularly of the general type disclosed in my prior U. S. Patent, No. 1,000,287, granted Aug. 8, 1911.

The structure shown in my said patent includes a tank which incloses a flat coil upon which the film to be treated is wound; and the principal object of the present invention is to improve the manner of associating the film with the coil that this operation may be carried out more quickly and with greater convenience.

The invention also includes an improvement in the device for removing the treated film from the tank, according to which the clasps by which the treated film is engaged are operated in a quick and convenient manner by a common actuating device.

The invention also includes an improvement in the coil, having in view the object of furnishing a better and more uniform support for the film.

The accompanying drawings illustrate an apparatus embodying the features of improvement referred to.

In the said drawings:—Figure 1 is a plan view of the improved apparatus; Fig. 2 is a vertical sectional view thereof on the line 2—2 of Fig. 1; Fig. 3 is a detail perspective view of an element which forms the upper bearing for the film spool; Fig. 4 is a detail sectional view showing the relation between the film and the coil; Fig. 5 is a detail sectional view showing the construction of the coil; Fig. 6 is a similar view showing a slight modification in the construction of the coil; Fig. 7 is a detail elevation of a key by means of which the film is wound upon the coil; Fig. 8 is a view partly in elevation and partly in section illustrating the device for removing the treated film from the tank; Fig. 9 is a sectional view on the line 9—9 of Fig. 8; and Fig. 10 is a detail view of one of the clamps which is used to secure the film upon the coil.

Similar characters of reference designate

corresponding parts throughout the several views.

An apparatus of the type shown in my prior patent referred to includes a tank 1, having a lid 2; a funnel 3 at one side of said tank and preferably of Z shape; and a vertical coil 4 within the tank and upon which the film to be treated is wound.

The tank 1 has at one side thereof an extension 5 which, together with an internal wall 6, forms a casing for the film spool 7. The lower bearing for this spool comprises a raised platform 8, provided with a centering pin 9 and the upper bearing for the spool comprises a centering pin 10. The pin 10 is provided with a gooseneck extension 11, the vertical leg of which has frictional engagement in a box or sleeve 12 which is suitably located on the wall 6.

The coil 4 is provided with a suitable number of circumferential beads 13. Two of these beads are shown in the drawings and they may be formed as shown in Fig. 5 by stamping the metal of the coil with a projection of suitable outline; or they may be formed as shown in Fig. 6 by the provision of wires which are suitably secured to the coil. The office of these beads is the same as that of the projections 14 shown in my prior patent, viz., to form a bearing for the paper lined non-sensitive surface of the film and to space the film throughout as great an extent as possible from the coil. The beads 13 are, however, superior to the projections referred to in that they afford a more uniform support for the film and at the same time have a smaller film contacting area. The coil is provided with suitably arranged openings 14 through which the liquid in the tank may have circulation.

The film is wound about the coil by means of a key 15, which is formed with a longitudinal slot 16, and adjacent the ends of the slot, though beyond the same, with fingers 17 which point toward one another. The fingers 17 engage in guide channels 18, which are formed circumferentially upon the coil 4 and preferably at the mean edges of overturned extensions 19 at each end of the coil. The outer sides of the channels 18 are flush with the outermost face of the beads 13.

In loading the apparatus, the film spool is positioned upon the platform 8, being centered by the pin 9 and thereupon the pin 10

is fitted into the spool, the leg of the extension 11 of said pin being fitted in the box or sleeve 12 and having sufficient frictional engagement in said box or sleeve to avoid becoming displaced. The black paper of the film roll is threaded through the slot 16 and the key is then given one or two turns to secure the paper which has been threaded through said key. Thereafter, the film and the black paper are connected by the gummed sticker with which the film is provided near where the word "Stop" occurs. In performing this operation the lower end of the key is centered in a socket 20 which is suitably located upon the base of the tank and which is provided with a slot 21, so arranged that the key may be withdrawn laterally from the socket in a direction to engage its fingers 17 in the channels 18. After the adjoining ends of the film and the black paper have been pasted together in the manner explained, the film is wound upon the coil, the key 15 being caused to follow the windings of the coil by the engagement of the fingers 17 in the channels 18. In winding the film upon the coil care must be taken that the black paper lining adjoins the beads 13 in order that the sensitive side of the film may be fully exposed to the action of the liquid in the tank. After the film has been completely wound upon the coil and the fingers 17 have passed from the channels 18, the key is disengaged from the end of the black paper lining by being given a sufficient number of turns for this purpose, and the film is thereupon secured at the ends of the coil by means of the clamps 22, one of which is shown in Fig. 10; and which are similar in all respects to the clamps 11 shown in my patent referred to.

After the film has been wound upon the coil, the lid 2 is applied and the operations of developing, fixing, and washing are carried out in the manner explained in my patent referred to. When these operations are completed, the film is removed by the device shown in Figs. 8 and 9. This device includes a pair of parallel upper and lower bars 23 and 24, the length of which corresponds to a diameter of the tank. The bar 24 has at its ends upstanding goosenecks 25 and together with the bar 23 supports a plurality of clasps 26, the number of which corresponds to the number of convolutions of the coil along a diameter of the tank. Each clasp 26 includes a spring-pressed finger 27, the upper end of which terminates at a point between the bars 23 and 24; and the said upper ends of the fingers 27 are connected to wires 28 of which there are two. The inner ends of the wires 28 are suitably connected to studs which project laterally from a post 29. The latter is journaled in the bars 23 and 24 and has at its upper end a suitable finger piece.

After the film has been completely treated the lid is removed from the tank and the film removing device is operated, the goosenecks 25 of said device being passed over the upper edge of the tank at opposite points thereof and the post 29 being turned so as to effect the simultaneous opening of the clasps 26. The film removing device is then lowered with its clasps open until about an eighth of an inch of the upper edge portion of the film has passed between the members of said clasps. Thereupon the post 29 is released and the springs with which the clasps are provided close the fingers 27 upon the film. The clamps 22 are then removed and the film is lifted from the tank.

The construction shown in my prior patent is not adapted for daylight loading, it being necessary to perform this operation in the dark room. With the present construction, however, the loading may be carried out either in the dark room or in daylight, according to the choice of the user, and depending on the materials employed. If daylight loading is desired, the spool is removed from the kodak and the superfluous part of the backing paper is torn away to within two or three inches of the word "Stop," or at the point where the gummed sticker is located. The film is then connected to the backing paper by means of this sticker and the end of the paper is trimmed in order that it may be readily threaded through the slot 16. The film spool is then fitted into the tank in the manner explained and the key 15 is engaged with the channels 18. Before unwinding the film from the spool, the developer should be poured into the tank as quickly as possible, and to a level about an inch or three quarters of an inch at least, above the top of the spool. For this operation the developer should have been previously made non-actinic by the use of any of the well known preparations for this purpose, care of course being taken as to the selection of strength and proportion with regard to the work at hand. After the developer has been added in the manner explained, the film is wound upon the coil and secured by the clamps 22, the lid is applied to the tank and the several steps of treatment are carried out.

The several parts of the apparatus are, where practical, constructed of copper and are heavily nickel-plated, in order that deterioration of the metal by the solutions brought into contact therewith during the several operations may be prevented.

Having fully described my invention, I claim:

1. In an apparatus of the type set forth, in combination, a tank, a perforate coil inclosed therein, means within the tank and at one side of the coil by which a film spool may be supported for turning movement, a

key constructed for engagement with the end of the film on said spool, and means including coacting parts on the coil and on the key whereby the latter may be caused to follow the convolutions of the coil in winding the film thereupon.

2. In an apparatus of the type set forth, in combination, a tank, a perforate coil inclosed therein, means within the tank and at one side of the coil by which a film spool may be supported for turning movement, a key constructed for engagement with the end of the film on said spool, the coil being provided with guide channels throughout the length thereof and projecting fingers provided on the key for engagement in said channels to cause the key to follow the convolutions of the coil in winding the film thereupon.

3. In an apparatus of the type set forth, in combination, a tank and a perforate coil inclosed therein and upon which a film to be treated may be wound, the coil having projections which extend circumferentially and continuously throughout the length of the coil and by means of which the film may be spaced uniformly from the body of the coil.

4. In an apparatus of the type set forth, in combination, a tank having perforate means therein upon which a film may be wound and by means of which the film may be exposed to the action of the solutions in the tank, a pin located at one side of the means and upon which a film spool may be centered, a second pin adapted to removably fit the upper end of the spool and having a gooseneck extension, and a fixed sleeve in which the depending leg of the gooseneck extension may be frictionally engaged.

5. In an apparatus of the type set forth, in combination, a tank, a perforate coil inclosed therein, means within the tank and at one side of the coil by which a film spool may be supported for turning movement,

a key constructed for engagement with the end of the film on said spool, means including coacting parts on the coil and on the key whereby the latter may be caused to follow the convolutions of the coil in winding the film thereupon, and a socket in which the lower end of the key may be fitted and which has a slot enabling the lateral withdrawal of the key.

6. In an apparatus of the type set forth, in combination, a tank, a perforate coil inclosed therein, means within the tank and at one side of the coil by which a film spool may be supported for turning movement, a key constructed for engagement with the end of the film on said spool, the coil being provided with guide channels throughout the length thereof, projecting fingers provided on the key for engagement in said channels to cause the key to follow the convolutions of the coil in winding the film thereupon, and a socket in which the lower end of the key may be fitted and which has a slot enabling the withdrawal of the key in a direction to engage the fingers of the latter in the channels of the coil.

7. As an element of a film treating apparatus which embodies a tank and a perforate coil therein upon which a film may be wound, a device for removing a treated film from the coil, which comprises a bar equipped with a plurality of clasps, a post arranged centrally of the bar for turning movement, and cords connecting corresponding members of the several clasps, and the post, whereby a turning movement of the latter provides for the simultaneous opening or the closing of the clasps.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FREDERICK FRANCIS NYC.

Witnesses:

L. A. SCHREINER,
CHAS. SCHREINER, Jr.