

1,347,032.

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M. HAMMOND, ADMINISTRATRIX OF W. A. HAMMOND, DEC'D.
FILM DEVELOPING DEVICE.
APPLICATION FILED FEB. 27, 1918.

Patented July 20, 1920.
2 SHEETS—SHEET 1.

FIG. 2

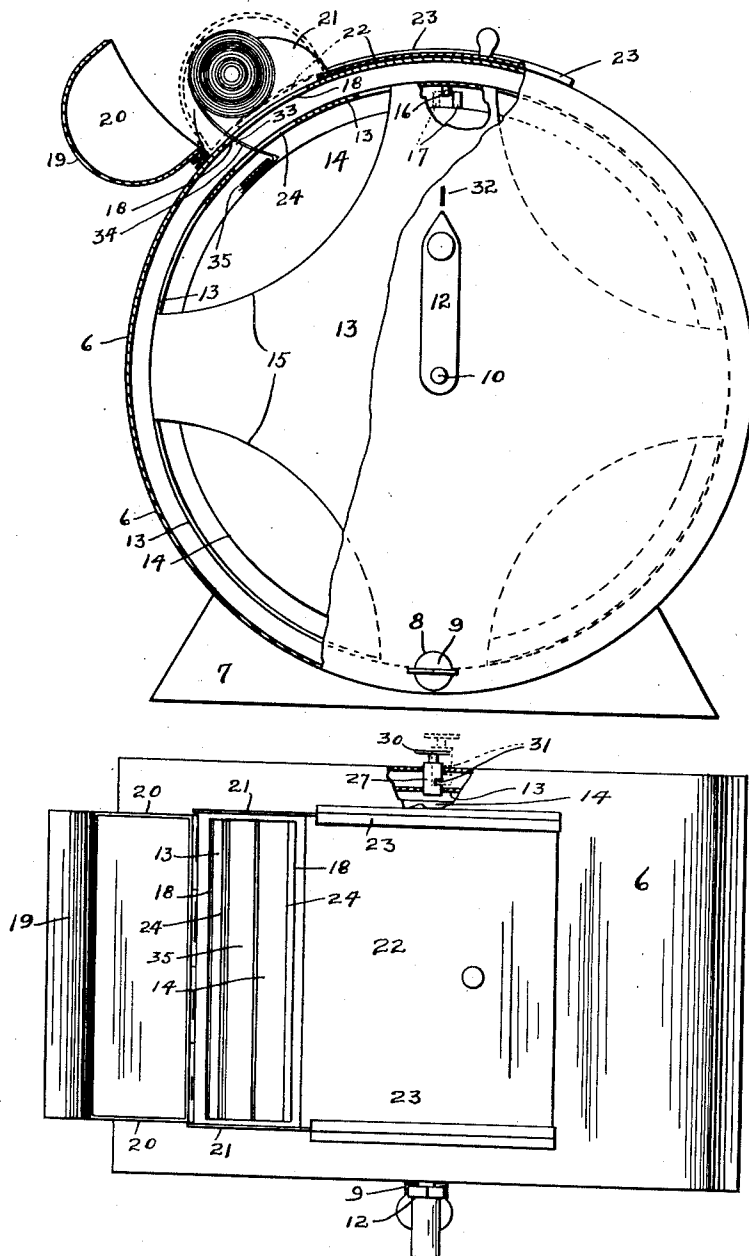


FIG. 1

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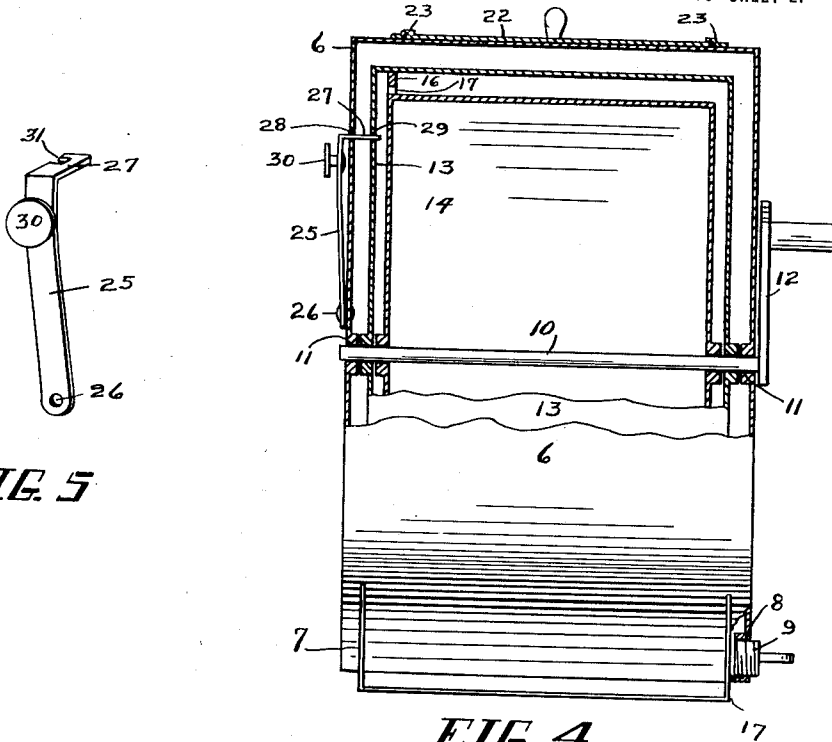


FIG. 4

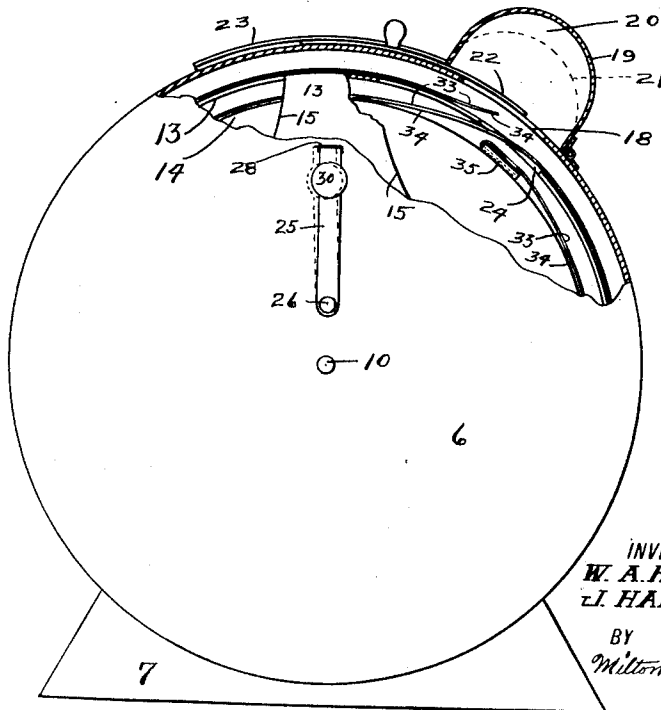


FIG. 3

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WINSLOW A. HAMMOND AND JAMES HAMMOND, OF RANDOLPH, NEBRASKA; METTA HAMMOND ADMINISTRATRIX OF SAID WINSLOW A. HAMMOND, DECEASED.

FILM-DEVELOPING DEVICE.

1,347,032.

Specification of Letters Patent.

Patented July 20, 1920.

Application filed February 27, 1918. Serial No. 219,385.

To all whom it may concern:

Be it known that we, WINSLOW A. HAMMOND and JAMES HAMMOND, citizens of the United States, and residents of Randolph, in the county of Cedar and State of Nebraska, have invented certain new and useful Improvements in Film-Developing Devices, of which the following is a specification.

This invention aims primarily to provide an improved means whereby photographic films may be properly and rapidly developed without the use of a dark room.

Another object of the invention is the production of an improved means whereby the time required for developing photographic films is reduced to the minimum.

Still another object of the invention is the production of a film-developing device particularly adapted for roll films.

Furthermore, the invention contemplates a film-developing device embodying certain novel and simplified features of construction whereby its size and cost of production is reduced to the minimum and the efficiency increased.

With these and other objects in view, the invention, consisting in the construction, combination and novel arrangement of parts, will be fully understood from the following description, reference being had to the accompanying drawings, which form a part of this application and in which like characters of reference indicate corresponding parts throughout the several views, of which:

Figure 1 is a plan of a device constructed in accordance with the invention, a portion being cut away;

Figs. 2 and 3 are opposite side elevations, parts being cut away and shown in section;

Fig. 4 is a front elevation of the same, parts being cut away and shown in section; and

Fig. 5 is a perspective view of the reel latch.

While we have illustrated and hereinafter described the preferred embodiment of the invention, we would not be understood as being limited to the specific structure chosen for illustration, for various alterations and modifications in the details of construction and arrangement of parts, may be made without departing from the spirit and scope

of the invention as defined in the appended claims.

The invention contemplates, broadly, a structure including a developing-fluid container which incloses a rotatable reel mechanism. The container is provided with an opening adjacent which is a film receptacle which normally closes the opening and yet permits the film to pass through the opening and be wound upon the reel mechanism, carrying the film through the developing fluid, all of which will presently be made clear.

An advantageous embodiment of our invention consists of a cylindrical case, 6, mounted on a suitable support, 7, and adapted to contain developing fluid. The case may be provided with a suitable drain-opening, 8, normally closed by a plug, 9. Extending coaxially through the case is a shaft, 10, journaled in suitable bearings, 11, in the side walls of the case. At one end the shaft is provided with a crank, 12.

The case incloses a drum, 13, which rotates freely on the shaft, 10, and within the drum, 13, is mounted a second drum, 14, fixed on the shaft, 10. The side walls of the drum, 13, are pervious or cut away as at 15, to permit passage of the fluid between the drums.

The drum, 13, is provided with an inwardly-extending part as the lug, 16, engageable by a tappet, 17, on the drum, 14, whereby rotation of the shaft in one direction causes the drums to turn in unison while rotation in the opposite direction causes the drum, 14, to rotate independently of its companion. The periphery of the case is provided with a transverse slot, 18, and adjacent the said opening is hinged a concavo-convex case, 19, which serves as a film receptacle and also as a closure for the opening, 18. The case, 19, is provided with end walls, 20, which, when the receptacle is closed over the opening, fit closely between flanges, 21, on the case to facilitate exclusion of light from the opening. 22 is a plate which slides on the periphery of the case toward and from the opening under suitable guides, 23, mounted on the case.

The periphery of the drum, 13, is provided with a transverse slot, 24, which registers with the slot, 18, when the said drum is in normal position. The drum, 13, is releasably locked in normal position by any preferred means.

In the present embodiment we provide for this purpose an elongated strip, 25, pivoted at one end as at, 26, to the case, its upper end being outwardly yieldable and provided with an arm, 27, which protrudes through an opening, 28, in the wall of the case and normally enters an opening, 29, in the adjacent wall of the drum, 13, thereby preventing rotation of the drum. The strip, 25, may be provided with a finger-grip, 30, whereby the strip may be withdrawn to disengage the arm, 27, from the drum, in which position the latch may be retained by slight lateral movement to engage a notched part, 31, of the arm, with the wall of the case.

The crank, 12, serves as an indicator which registers with a character, 32, on the wall of the case to indicate that the opening, 29, in the wall of the drum, 13, is in position to receive the latch member, 27.

To operate the embodiment illustrated, developing fluid is first introduced into the case through the opening, 18. The drums are then brought to the positions indicated in Fig. 2, by turning the crank counterclockwise, bringing the tappet into engagement with the stud, 16, and continuing rotation until the indicator registers with the character, 32. The latch, 25, is then released to engage the outer drum. The crank is then turned clockwise until the tappet, 17, engages the opposite side of the stud, 16. The film roll, which usually consists of the film strip, 33, wound in a roll together with a protecting strip of paper, 34, is then placed in the film receptacle and the ends of the strips introduced through the slots, 18, and 24, of the case and outer drum, respectively, and inserted under a strip, 35, mounted on the inner drum and adapted to hold the film end.

Obviously the film engaging member, 35, and the tappet, 17, should be so related that when the latter is in engagement with the stud, 16, the former will be accessible through the openings of the case and outer drum. The plate, 22, is then slid over to reduce the size of the slot, 18, and serves as a support for the film-roll, when the film receptacle, 19, is closed as shown in dotted lines in Fig. 2.

The inner drum is then turned clockwise until the film is partially wound thereon. The latch, 25, is then disengaged from the drum, 13, whereupon the remainder of the film is wound upon the outer drum as shown in Fig. 3. Rotation of the drum is then continued until the developing process is complete. The film is then readily removed by withdrawing its end from the case until the film is removed from the outer drum, then locking the outer drum against rotation while withdrawing the remainder of the film from the inner drum.

Having thus described our invention,

what we claim as new and desire to secure by Letters Patent, is:—

1. A film-developing device comprising a developing-fluid container, reel mechanism rotatable therewithin, the container having a film passage, a case hinged to the container to open and close the passage, and adapted to rotatably inclose a film roll, and film-engaging means on the reel mechanism, whereby the film may be wound from the case onto the reel mechanism.

2. A film-developing device comprising a developing-fluid container, reel mechanism rotatable therewithin, the container having a film passage, a case pivoted on the container to open and close the passage and adapted to inclose a film roll, film-engaging means on the reel mechanism whereby the film may be wound from the case onto the reel mechanism, and a plate mounted on the container to reduce the size of the passage.

3. A film-developing device comprising a cylindrical horizontally-disposed developing-fluid container, reel mechanism rotatable therewithin, the container having a peripheral film-receiving opening, a concavo-convex cover hinged to the container to open and close said opening and adapted to rotatably inclose a film roll, and film-engaging means on the reel mechanism, whereby the film may be wound from the cover onto the reel mechanism.

4. A film-developing device comprising a cylindrical horizontally-disposed developing-fluid container, reel mechanism rotatable therewithin, the upper periphery of the container being provided with a film-receiving opening, a case pivoted on the container to open and close the opening and adapted to rotatably inclose a film-roll, film-engaging means on the reel mechanism, whereby the film may be wound from the case onto the reel mechanism, and a plate slidably supported by the container to partially close the opening and support the film roll.

5. A film-developing device comprising a fluid container, a rotatable shaft therewithin, a film-engaging drum fixed on the shaft, a second drum rotatable outside said first drum, said container and second drum having openings through which a film may be engaged with the first drum, coacting parts on the drums to cause the drums to rotate in unison, and an indicating arm on the shaft to indicate the relative positions of the openings.

6. A film-developing device comprising a fluid container, inner and outer drums therewithin, film-engaging means on the inner drum, the outer drum and container having openings through which a film may be passed to be engaged by said means, means for rotating the inner drum and subsequently rotating the drums in unison, and a latch for releasably locking the

outer drum, including an elongated strip mounted on the container to move inwardly and outwardly and having an inwardly-extending part, the container having an opening to receive said part, and a shoulder on the end of the outer drum engageable by said part, said part being disengageable from the shoulder by moving the strip outwardly.

7. A film-developing device comprising a fluid container, inner and outer drums there-within, film-engaging means on the inner drum, the outer drum and container having openings through which a film may be passed to be engaged by said means, means for rotating the inner drum and subsequently rotating the drums in unison, and a latch including a strip pivoted on the container to move laterally, a free end of the strip being yieldable outwardly and provided with an inwardly-extending laterally-shouldered part, the container having an opening to receive said part, and the end of the outer drum having a recess to receive said part, the shoulder of said part being engageable with the container wall when the strip is moved laterally to hold the part from the recess.

8. A film-developing device comprising a fluid container, outer and inner film-winding drums within the container, means for rotating the inner drum a distance and subsequently rotating both drums in unison,

and a latch to releasably hold the outer drum against rotation, including an elongated strip on the container, yieldable outwardly and having an inwardly-extending shouldered part, the container having an opening to receive said part, and the outer drum having a recess to receive said part, said shouldered part being engageable with the container wall when the strip is moved outwardly, to hold said part from the recess.

9. A film-developing device comprising a developing-fluid container, a pervious drum rotatable therein, a second drum rotatable within said first drum, film-engaging means on said second drum, the container and said first drum having openings, a case on the container adapted to inclose a roll-film and cover the opening of the container, said openings and means being so related as to register when said drums are in normal position whereby the film end may be introduced through the openings and engaged with said means, means for rotating said second drum to wind a portion of the film thereon, and means for subsequently rotating both drums, whereby the remainder of the film is wound on said first drum.

In testimony whereof we have hereunto set our hands this 4th day of Febr., 1918.

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