

1,051,789.

J. E. WALLACE.
DEVELOPING TUBE.
APPLICATION FILED JUNE 14, 1912.

Patented Jan. 28, 1913.

2 SHEETS-SHEET 1.

Fig. 1.

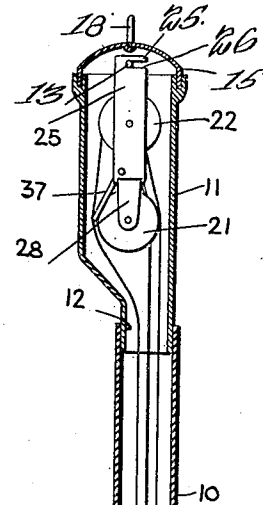
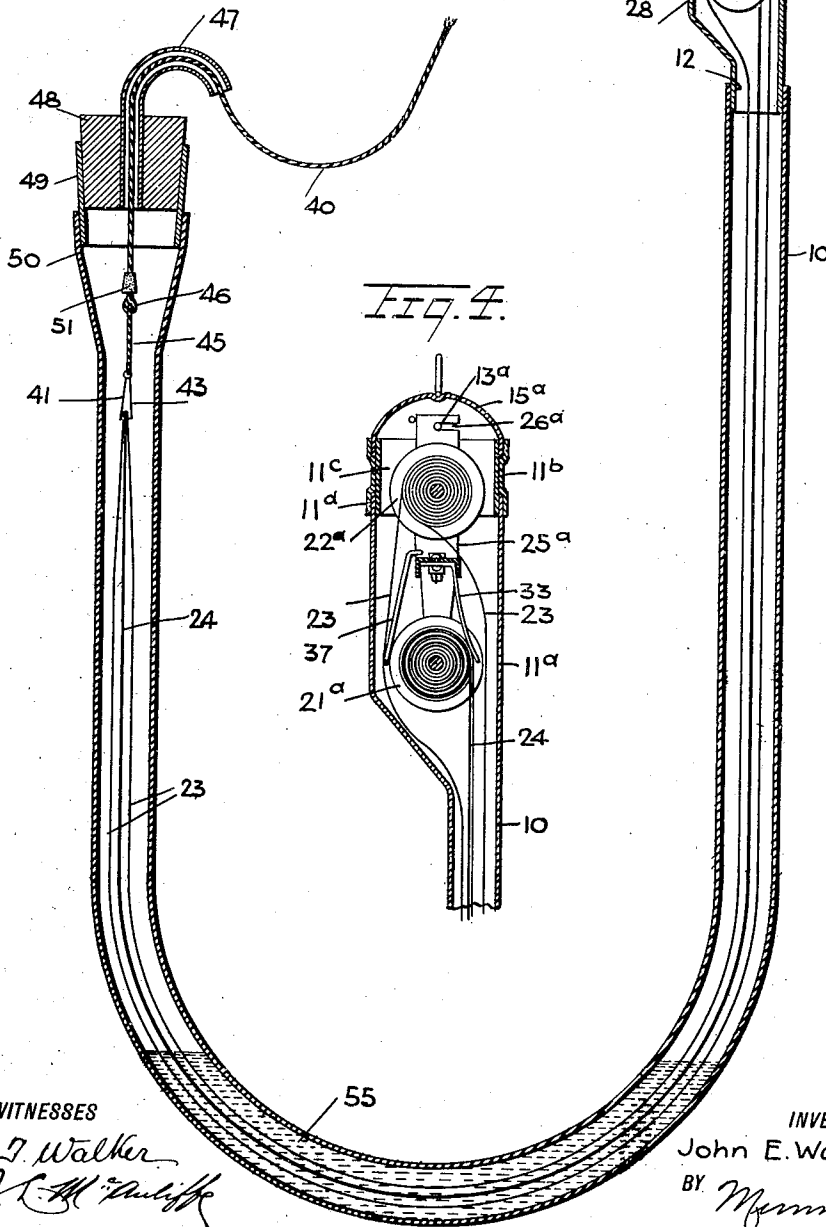


Fig. 4.

WITNESSES

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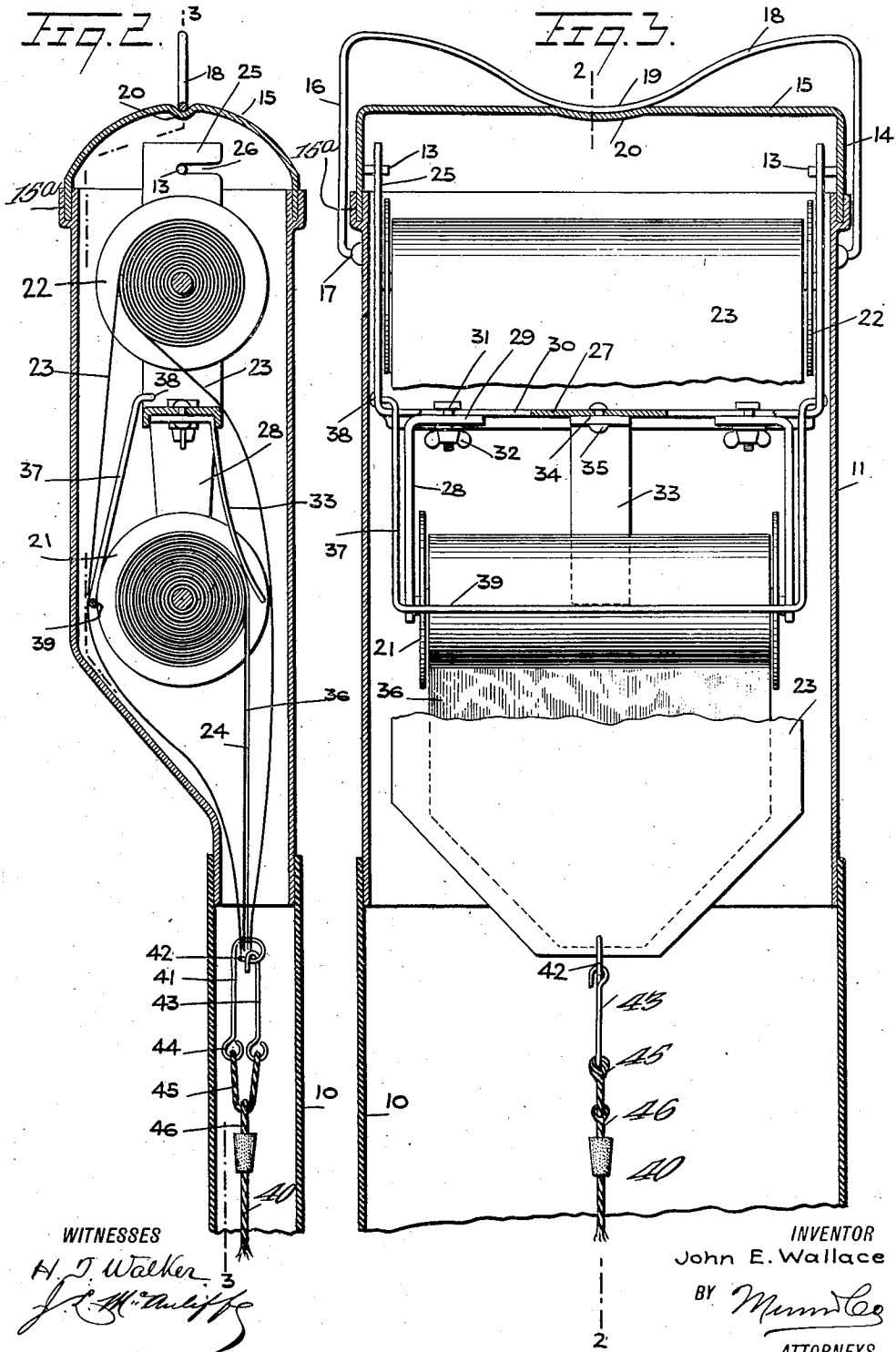
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UNITED STATES PATENT OFFICE.

JOHN EDWARD WALLACE, OF VARNA, ILLINOIS.

DEVELOPING-TUBE.

1,051,789.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed June 14, 1912. Serial No. 703,642.

To all whom it may concern:

Be it known that I, JOHN E. WALLACE, a citizen of the United States, and a resident of Varna, in the county of Marshall and State of Illinois, have invented a new and Improved Developing-Tube, of which the following is a full, clear, and exact description.

An object of my invention is to provide an improved means whereby photographic films may be developed in daylight.

A further object is to provide a form of device convenient for carrying without liability of injury.

A further object is to provide a developing means that may be conveniently manipulated and which will insure that the film is effectively subjected to the developing fluid.

The distinguishing features of my invention and the important structural elements characterizing the preferred embodiment which is illustrated as an example, will be more particularly explained in the specific description hereinafter to be given.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of my developing tube and its appurtenances; Fig. 2 is a sectional elevation on a larger scale of means appurtenant to one end of the developing tube, taken on about the line 2—2 of Fig. 3; Fig. 3 is a sectional elevation, the section being taken on about the line 3—3 of Fig. 2; and Fig. 4 is a sectional elevation of one end of the developing tube, illustrating a slightly different form.

In forming the illustrated practical embodiment of my device, an elongated tube 10 is provided formed of flexible material made waterproof and lightproof, and of a length to contain any desired length of film.

At one end the tube is provided with a detachable spool box 11, in which a spool frame is suspended. The box 11 has a tubular neck 12 at its lower end for connection with the tube 10. The spool frame hereinafter described is suspended prefer-

ably from interior pins 13 formed on the flange 14 of a cover 15, said cover preferably being received at its lower end in an annular groove 15^a formed in the upper end of the box 11. The cover 15 may be held in place by a fastener belt 16, pivoted as at 17, on the body 11, and having a cross bar 18 formed with a curved portion 19 that is received in a depression 20 in the cover for holding the cover tightly in place.

Within the box frame members are provided for revolvably supporting a film spool 21 and a spool 22 on which is wound aprons 23, the aprons being in the form of strips of any suitable material, said aprons serving to receive the film 24 between them and constitute shields to protect the film against injurious contact with the sides of the tube 10. The apron spool is journaled in hangers 25 which are slotted, as at 26, to receive suspending pins 13, and to a cross bar 27 connected with the arms 25 hangers 28 are secured, in which the film spool 21 is journaled. The upper ends 29 of the hangers 28 are laterally and adjustably secured to the cross bar 27 of the upper frame, as by forming slots 30 in said cross bar, there being bolts 31 passed through the said slots and through the bent upper ends 29 of the arms 28, the bolts being provided with wing nuts 32, or equivalent.

A brake device is provided for the film spool, consisting, in the form shown, of a spring plate 33 secured at its upper end 34 to the cross bar 27 by a rivet 35, or otherwise, the said plate spring bearing at its lower end against the usual duplex paper 36, which is wound with the film. A stirrup-shaped brake or frame 37 is pivoted at its upper end, as at 38, to the hanger frame 23 of the apron spool, and the cross bar 39 of said belt, rests on the film spool 21 at its perimeter, beneath one of the aprons 23 to hold the same outward from the film spool.

In practice, the film is drawn through the tube from the spool box 11 to the opposite end of the said tube, and for this purpose a cord 40 carries at one end a fastener for engaging the film, said fastener being shown as consisting of a hook 41 adapted to have

its bill 42 passed through the aprons, the film, and the duplex film paper, and a companion hook 43 to engage the bill 42, the hooks 41, 43 being shown as formed with eyes 44 that are connected by a cord 45 or the like, with an eye 46 on the end of the cord 40. The cord passes through an inlet tube 47 which is desirably curved inward at its end, to better exclude light, said tube being carried by a stopper 48 that fits in a nipple 49 adapted to the end 50 of the tube. The cord 40 carries a plug 51 adapted to close the inner end of the tube 47.

To employ the described developing tube and its appurtenances, the film spool, with the exposed film, is placed in the arms 28 below the apron spool, and the aprons 23 are drawn downward over opposite sides of the film spool. The usual sticker on the film roll is then broken, and the paper drawn off until the end of the film is exposed. A hole is then punched through the ends of the aprons through the duplex paper of the film and through the film, and the bill of the fastener hook 41 is passed through said hole, and said hook 41 engaged with the companion hook 43 of the fastener. The cord is passed through the tube to the opposite end 50, and the tube is adjusted on the spool box 11. The cord is then drawn to unroll the film and the protective aprons. The tube is charged with a sufficient quantity of developing fluid 55, the end 50 of the tube is closed with the stopper 48, and the cord is drawn to bring the plug 51 in position to close the inner end of the tube 47. The tube may now be flexed, the opposite ends of the tube alternately being raised and lowered to run the fluid over the film. It will be understood that the tube should be kept in agitation while the developer 55 is being poured thereinto. The developing having been completed, the developer may be poured out of the tube and water substituted, and the tube then manipulated as before to wash the film.

In the form shown in Fig. 4, the tube 10^a is formed with an enlarged integral end portion 11^a, similar in shape to the spool box 11 previously described and constituting in effect a flexible spool-receiving box, and in connection with said end 11^a, a neck or stiffening ring may be employed, comprising inner and outer members 11^b and 11^c, between which the upper end of the tube is secured, as at 11^d. A cover 15^a is receivable between the upper ends of the members 11^b, 11^c, and is provided with side pins 13^a, which are received in slots 26^a of hangers or depending frame members 25^a which carry spools 21^a, 22^a, for the film 24 and aprons 23 respectively. The previously described spring plate 33 and the brake

frame 37 are also employed in the construction shown in Fig. 4. With the integral enlarged part 11^a the spool frame may be placed in the tube and withdrawn from the same by placing and removing the cover 15^a in a manner similar to that previously described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A developing device, comprising a flexible tube adapted to contain a fluid, and means for drawing a film into said tube.
2. A developing device, comprising a flexible tube, a spool box attachable to one end, means for closing the opposite ends, 80 and means for drawing a film from the spool box toward the opposite end of the tube.
3. In a photographic developing apparatus, a flexible tube adapted to contain a fluid, said tube being of a character to exclude deleterious light rays, and spool-holding means at one end of said tube.
4. A photographic developing apparatus, comprising a water-proof and light-proof flexible tube, and means for drawing a film into said tube.
5. A photographic developing apparatus, comprising a member adapted to receive a developing fluid, a spool box having a duplicate apron wound thereon, means for mounting a film spool in said box, means for drawing the film and aprons from said box toward the opposite end of the tube, and means for effecting a closure of said opposite end.
6. In a developing device, the combination of a flexible tube adapted to contain a developing fluid, a spool box, a cover for said box, a frame carried by said cover, an apron spool mounted in said frame, means for supporting a film spool in said frame, and means for drawing the film and aprons together toward the opposite end of the tube.
7. A developing device, comprising a flexible tube, a spool box attachable to said tube, a frame in said box, an apron spool mounted in said frame, supports for a film spool below said apron spool, a device carried by said frame to sustain an apron away from the film spool, and means for drawing the apron and film toward the opposite end of the tube.
8. A photographic device, comprising a flexible water-proof and light-proof tube, a spool box attachable to one end of said tube, means for mounting a film spool in said box, a cord movable in said tube and having means for engaging a film, and a closure for the opposite end of the tube, said closure having a passageway for the said cord.

9. A developing device, comprising a flexible tube, a spool carrier, means at one end of said flexible tube for receiving and supporting said spool carrier, said carrier comprising means for supporting a film spool, and a spool supported on said carrier and provided with aprons.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN EDWARD WALLACE.

Witnesses:

M. LEAH SWEM,
GEO. H. DANIELS.