D. R. WINSLOW.

FILM DEVELOPING APPARATUS.

APPLICATION FILED MAY 20, 1916.

1,245,848.

Patented Nov. 6, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

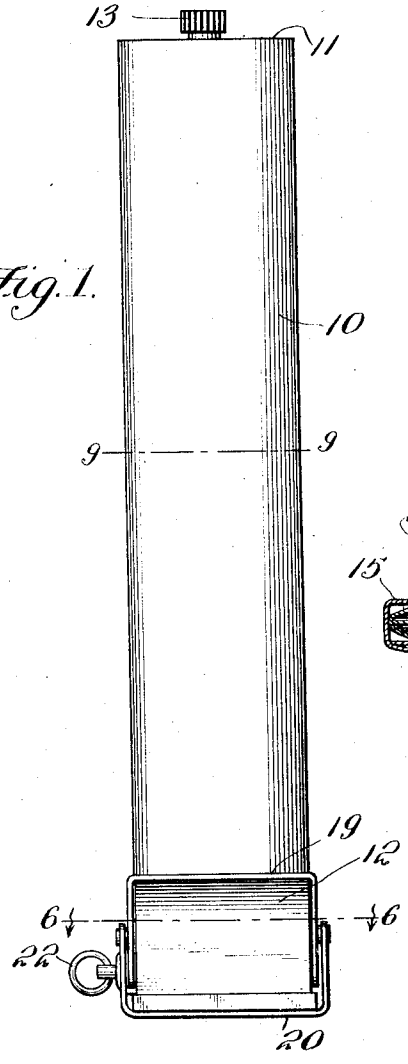


Fig. 2.

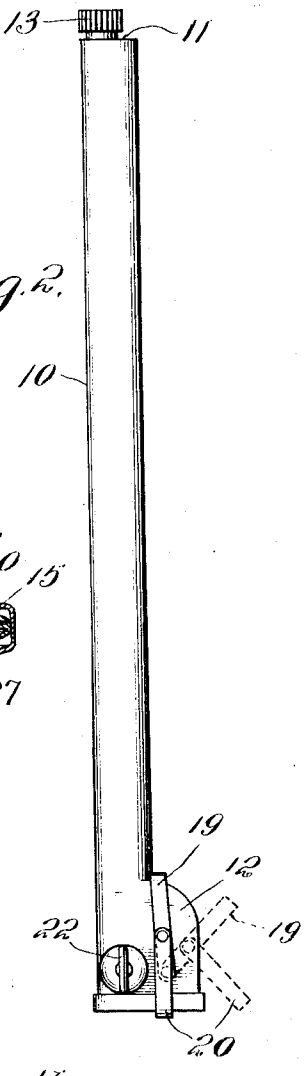


Fig. 3.

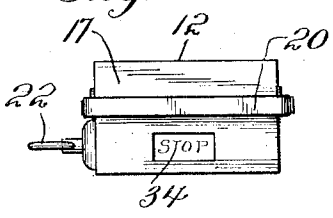


Fig. 4.

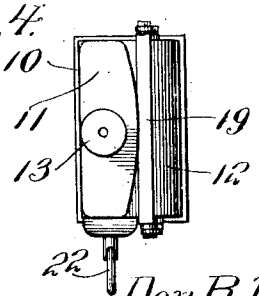
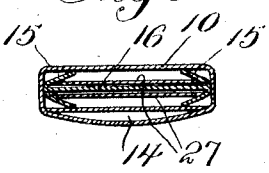


Fig. 9.



Witnesses

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2 SHEETS—SHEET 2.

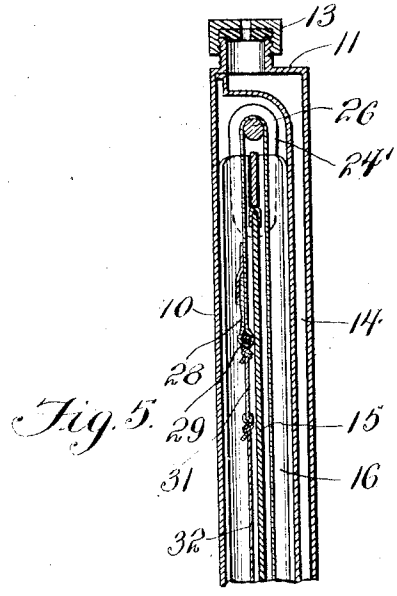


Fig. 5.

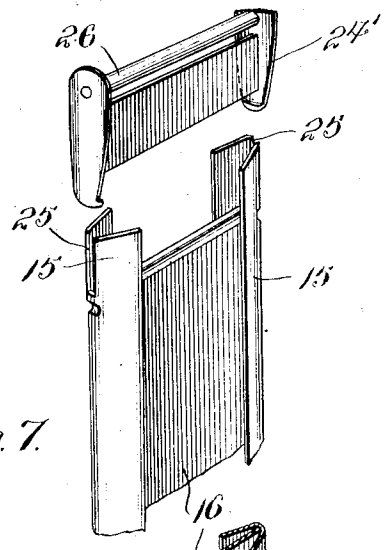


Fig. 7.

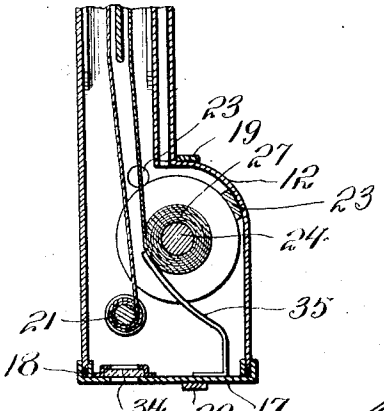


Fig. 6.

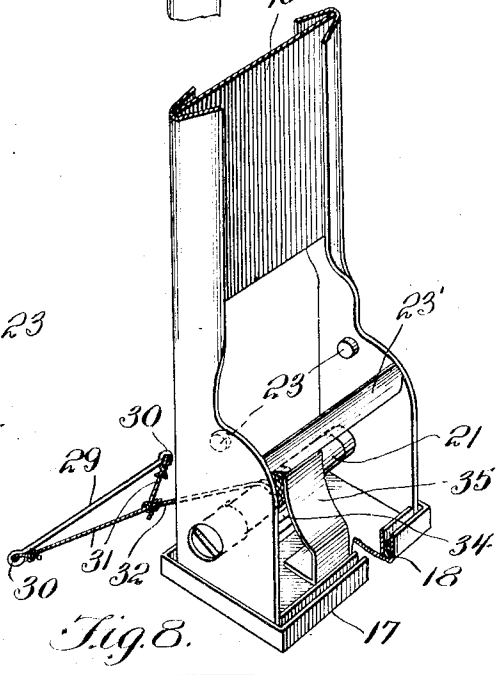
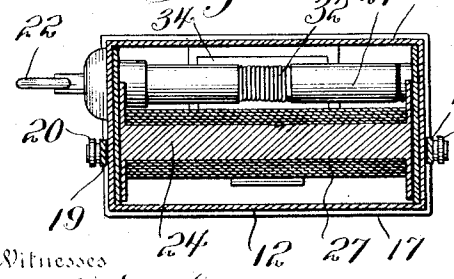
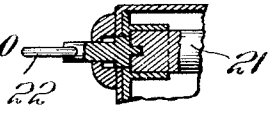


Fig. 8.





Witnesses

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UNITED STATES PATENT OFFICE.

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FILM-DEVELOPING APPARATUS.

1,245,848. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed May 20, 1916. Serial No. 98,837.

To all whom it may concern:

Be it known that I, DON R. WINSLOW, a citizen of the United States, residing at Zumbrota, in the county of Goodhue and State of Minnesota, have invented new and useful Improvements in Film-Developing Apparatus, of which the following is a specification.

The invention relates to a film developer, and more particularly to the class of roll film developing apparatus.

The primary object of the invention is the provision of a developing apparatus of this character wherein a film roll, after being taken from a camera, or the like in the daylight, can be conveniently placed in the developer for the developing of the entire roll with despatch, the film strip being advanced within the apparatus in a novel manner to assure the successful developing thereof.

Another object of the invention is the provision of a developing apparatus of this character wherein the construction thereof is novel in form so that the film roll can be readily introduced therein during daylight for the development of the film strip, as the said apparatus is absolutely lightproof and one or a number of films can be successfully developed, the apparatus being readily portable so that it can be conveniently carried from one point to another.

A further object of the invention is the provision of a developing apparatus of this character wherein minimum developing fluid is required and the developing can be carried forth in the least possible time.

A further object of the invention is the provision of a developing apparatus wherein the film strip, when being developed, cannot possibly become broken or torn and the same will be perfectly developed prior to the removal of the film roll from the said apparatus.

Other objects will be in part obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a side elevation of an apparatus constructed in accordance with the invention;

Fig. 2 is an edge elevation;

Fig. 3 is a bottom plan view;

Fig. 4 is a top plan view;

Fig. 5 is a vertical longitudinal sectional view;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1;

Fig. 7 is a perspective view of the film carrier and tank head removed from the casing of the apparatus;

Fig. 8 is a fragmentary transverse sectional view showing in detail the winding key engaged with the winding roller;

Fig. 9 is a sectional view on the line 9—9 of Fig. 1.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring to the drawings in detail, the developing apparatus comprises an elongated shell or casing 10, preferably made from metal, closed at the end 11 thereof, while its opposite flared end 12 is open, the closed end 11 being provided with a removable screw cap 13 which, when detached, permits the introduction of developing solution therein. Arranged interiorly of the shell or casing 10 is an air duct 14, the inner end of which opens into the said shell or casing, while the outer end of the same opens through the top of the said shell or casing to the atmosphere.

Insertible within the said shell or casing 10 at the open flared end 12 thereof is a film carrier comprising V-shaped longitudinal guide strips 15 which are fixed to opposite longer edges of a partition 16 which is mounted on a tank head 17, the mouth edge of which has fitted thereto a packing 18 so that when the tank head 17 is joined with the flared end 12 of the shell or casing 10 the joint therebetween will be rendered fluid-tight and air-tight to avoid leakage.

At opposite sides of the flared end 12 and pivotally supported thereon are yoke-like latch members 19 and 20 which are pivoted to each other and adapted for detachable engagement with the tank head 17 and the flared end 12 of the shell or casing 10 for locking the shell or casing in position and holding the tank head tight thereon.

Journaled in the tank head 17 at one side of the partition 16 is a winding spool 21 which has detachably engaged in one end thereof a winding key 22 suitably mounted upon the flared end 12 of the shell or casing

10, and this key permits the manual rotation of the winding spool, as will be obvious. Formed in the carrier 15 at the end thereof which carries the head 17, this end being correspondingly shaped to the flared end 12, are lugs 23 and supporting bar 23′ providing a seat for the film roll spool 24 which is of the ordinary well known construction, and upon this spool is normally wound the film strip to be developed.

The guide strips 15 of the carrier have fitted thereon a removable end 24′, the carrier being slitted at 25 for the feeding of the end 24′ thereon, and in this end is journaled a guide roller 26, over which is adapted to travel the film strip 27 for guiding the same from one side of the partition 16 to the other within the shell or casing 10 for the successful development of the film.

The film strip is normally rolled upon the spool 24 with the usual light-proof paper covering the same to avoid the film being light struck when transferred from the camera to the developing apparatus. This light-proof paper carries at its free end a loop 28 to which is connected a bail 29 having eye terminals 30 to which are connected the branches 31 of a pull cord 32, the same being also connected to the spool 21 for the winding of the same thereon, whereby the film strip can be advanced from one side of the partition 16 to the other for the positioning of the film to permit the developing thereof.

In the use of the developing apparatus, initially, the shell or casing 10 is in inverted position, with the flared end 12 upward, and through this flared end is inserted the film carrier after the placing of the film roll therein and the connecting of the pull cord 32 with the light-proof strip on the film.

When the tank head 17 has been locked with the flared end 12 of the shell or casing 10 the film is then wound into position and this is accomplished by turning the winding key 22 engaged with the receiving spool 21 until the word "Stop," which is on all films, shows through the colored glass 34 in the top of the tank head 17, thus indicating that the film strip has been advanced from one side of the partition 16 to the other for the distance of the stretch of said film. The film thus operated upon is now in position before the solution is poured into the tank and is not moved after the solution is introduced for the process of development of the film. It is of course understood that the colored glass 34 permits one to determine when the film is in position before the solution is introduced.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the herein described film developing apparatus will be readily understood and, therefore, a more extended explanation has been omitted.

Having thus described my invention, I claim:

1. A developing tank including a casing, and a film carrier removably inserted in the casing and formed at opposite ends for directing the film, said carrier having inwardly divergent side walls to overlie the edges of the film.

2. A developing tank including a casing, and a film carrier removably inserted in the casing and formed at opposite ends for directing the film, said carrier having inwardly divergent side walls to overlie the edges of the film, the film guiding means at one end of the carrier being removably connected with said carrier.

3. A developing tank comprising a casing of elongated form having an open enlarged bottom, a carrier slidably mounted within the casing and having side walls to engage edges of the casing to guide the carrier in movement, a film supporting member mounted in the lower portion of the carrier, a film guiding member removably connected with the upper part of the carrier, and a plate arranged on the lower end of the carrier and formed to receive the lower edges of the casing when the carrier is in place therein, to seal the open end of the casing.

In testimony whereof I affix my signature.

DON R. WINSLOW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."