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J. E. STROMBERG.  
PHOTOGRAPHIC FILM OR PRINT DEVELOPING APPARATUS.  
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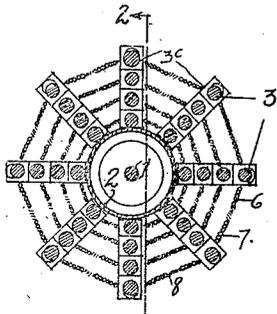


Fig. 1.

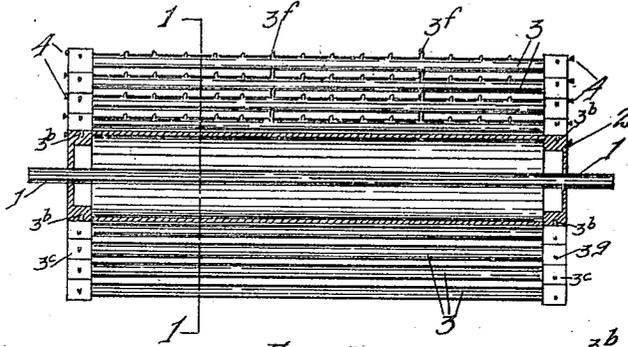


Fig. 2.

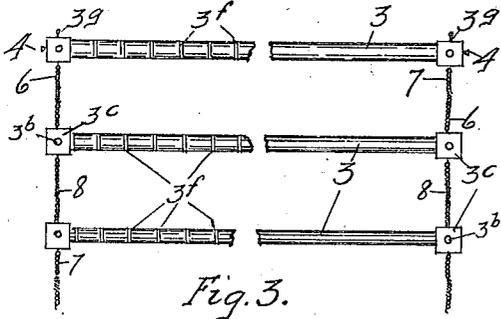


Fig. 3.

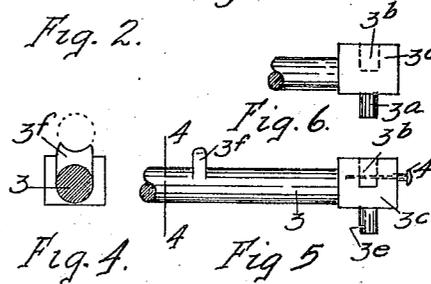


Fig. 4.

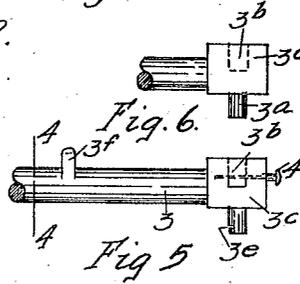


Fig. 5.

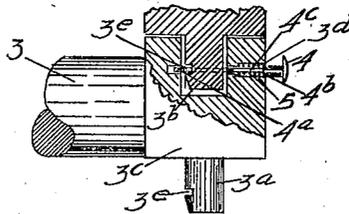


Fig. 6.

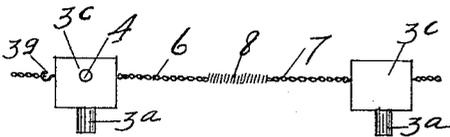


Fig. 7.

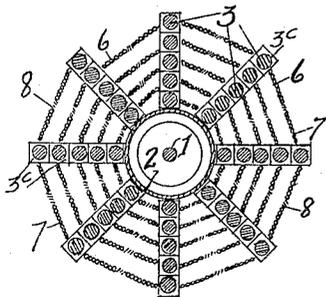


Fig. 8.

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## UNITED STATES PATENT OFFICE.

JEAN E. STROMBERG, OF SAN DIEGO, CALIFORNIA.

PHOTOGRAPHIC FILM OR PRINT DEVELOPING APPARATUS.

Application filed January 13, 1921. Serial No. 436,912.

*To all whom it may concern:*

Be it known that I, JEAN E. STROMBERG, a citizen of the United States, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Photographic Film or Print Developing Apparatus, of which the following is a specification.

My invention relates to a reel shaped apparatus for developing, fixing, washing and drying photographic films or prints of great length and the objects of my invention are: First, to provide a reel apparatus which is so constructed that photographic films or prints of great length may be wound thereon for convenient handling during developing, fixing, washing and drying. Second, to provide a reel apparatus of this class in which the supports are built up as needed, one upon the other either in concentric or spiral form. Third, to provide a reel apparatus of this class with novel means for supporting the film supporting members one upon the other in their certain relative positions. Fourth, to provide a reel apparatus of this class on which a narrow film may be wound in spiral form with means for supporting it in position. Fifth, to provide a reel apparatus of this class in which the various supporting members are supported in spaced relation with yieldable means in connection therewith to provide for variation. Sixth, to provide a novelly constructed developing, fixing, washing and drying reel apparatus of this class. Seventh, to provide a reel apparatus on which photographic films and prints may be wound in such a manner that sensitized surfaces cannot come in contact with any of its parts or with portions of itself. Eighth, to provide a reel apparatus on which photographic films and prints may be wound and provided with proper space for the proper movements of chemicals and liquids for developing, washing and fixing and providing proper clearance for ventilation for drying purposes; and ninth, to provide a reel apparatus of this class which is very simple and economical of construction, durable, easy to operate and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the

appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a transverse sectional view of my apparatus in one form through 1—1 of Fig. 2; Fig. 2 is a longitudinal sectional view through 2—2 of Fig. 1; Fig. 3 is a detailed fragmentary side elevational view of the supporting members in their extended position; Fig. 4 is a sectional view through 4—4 of Fig. 5; Fig. 5 is an enlarged detailed fragmentary side elevational view of one of the supporting bars; Fig. 6 is a similar view showing the same in a slightly modified form; Fig. 7 is an enlarged fragmentary side elevational view of one of the supporting bars in the form shown in Figure 5 and showing a portion broken away and in section to facilitate the illustration; Fig. 8 is a view of two of the supports in their certain spaced relation to each other and showing the yieldable means for supporting them in such relation and Fig. 9 is a similar view to Fig. 1 showing the same in a slightly modified form.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

The shaft 1, drum 2, supporting bars 3, latch member 4, spring 5, chains 6 and 7 and spring 8 constitute the principal parts and portions of my apparatus.

The shaft 1 is an ordinary shaft which is adapted to be journaled in any supporting member and revolved therein; secured thereto is a drum member 2, which is preferably metallic and liquid tight, so mounted that the extended ends of the shaft 1 protrude past the ends of the drum 2. Secured to this drum are a plurality of supporting members 3, constructed as shown best in Figures 5 and 7 of the drawing with the lugs 3<sup>a</sup> extending inwardly. Then the rest of the reel is built up by means of a series of these supports 3, positioned one upon the other by means of the lugs 3<sup>a</sup> and supported in certain spaced relation to each other by means of the chains 6 and 7 and spring 8 which connects the chains 6 and 7, thus providing a spring take up for holding the supporting members 3 in spaced relation and permitting the placing of the supports one upon the other. Each of the supporting members 3 is provided on each of its extended ends with an enlarged portion 3<sup>b</sup> which enlarged por-

tion 3<sup>c</sup> is provided with a recess 3<sup>b</sup> and a lug 3<sup>a</sup>. The lug 3<sup>a</sup> is adapted to fit into the recess 3<sup>b</sup> of an adjacent supporting member when they are positioned one upon the other as shown best in Figures 1, 2, and 9 of the drawings. Portion 3<sup>c</sup> is provided on its sides with a hook 3<sup>e</sup> for supporting the chains 6 and 7.

In order to more securely support these supporting members 3 in their relative position to each other, I have provided a latch member 4 which is provided with an annular member 4<sup>a</sup> adapted to extend around the lug member 3<sup>a</sup> and fit into the recess 3<sup>c</sup>. Secured to the annular member 4<sup>a</sup> and extending out through the member 3<sup>c</sup> is a shaft member 4<sup>c</sup> provided with a shoulder 4<sup>b</sup> against which one end of the spring 5 rests. The other end of the spring 5 rests against the inner end of a recess 3<sup>d</sup> in the member 3<sup>c</sup>. This spring 5 tends to hold the annular member 4<sup>a</sup> in engagement with the notch 3<sup>e</sup> of the lug 3<sup>a</sup> but may be readily released by pressing the member 4 which compresses the spring 5.

It will be here noted, however that the latch member 4 may be dispensed with if desired.

The supporting members 3 are also provided with a plurality of extended lugs 3<sup>f</sup> adapted to support the photographic film or print between said lugs and these lugs 3<sup>f</sup> are positioned in spiral form on each series of supports so that a film or print is wound on these supports in spiral form starting at one end of the reel and ending at the other if the film or print is of sufficient length. This film or print is first secured in any suitable manner to one of the supports 3.

It will be here noted, however, that these lugs 3<sup>f</sup> may be dispensed with if desired, (particularly when a film or print of great width is to be developed).

Though I have shown and described a particular construction, combination and arrangement of parts and portions and slight modifications thereof, I do not wish to be limited to this particular construction, combination and arrangement nor to the modifications thereof, but desire to include in the purview of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

It is obvious that with this construction

there is provided a reel apparatus for use in developing, fixing, washing and drying films, prints and the like, whereby films or prints of any length may be developed, fixed, washed and dried. That the apparatus may be enlarged and is so constructed that the supports are positioned with one series upon another series so that the apparatus may be extended to any size desired for supporting the films or prints. That the supports are held in their certain relation to each other by yieldable resilient means to facilitate their fitting one upon the other. That the device as a whole is very simple and economical of construction, easy to operate, easy to wind the film or print upon, may be readily immersed with the film or print in position thereon for developing, fixing and washing and also used for drying the film or print while positioned thereon.

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

1. An apparatus of the class described including a drum member, an axis for supporting said drum member, a series of supporting members mounted around said drum member, another series of supporting members resiliently connected together and provided with means for engaging the first mentioned supporting members for holding them in certain relation to said first mentioned supporting members.

2. An apparatus of the class described including a drum member provided with an extended axis, a plurality of supporting members secured to said drum member, each provided with a plurality of separators on its outer surface.

3. An apparatus of the class described including, a drum member provided with an extended axis, a plurality of supporting members secured to said drum member, each provided with a plurality of separators on its outer surface, and a plurality of series of similar supporting members resiliently connected together and provided with means whereby one series is engaged by its adjacent series for supporting them in certain relation to each other.

In testimony whereof, I have hereunto set my hand at San Diego, California, this 6th day of January, 1921.

JEAN E. STROMBERG.