E. B. HANSBURY.

DEVELOPING FRAME FOR PHOTOGRAPHIC FILMS.

APPLICATION FILED MAR. 25, 1908.

917,940. Patented Apr. 13, 1909.

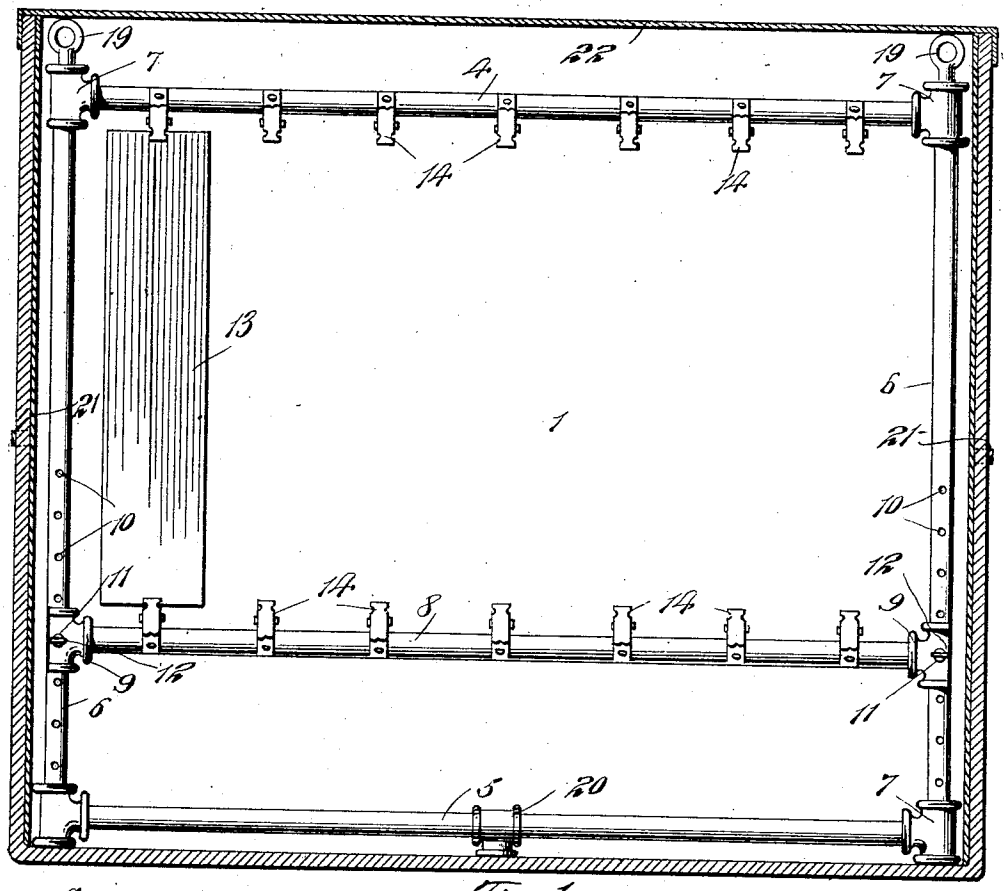


Fig. 1.



Fig. 2.

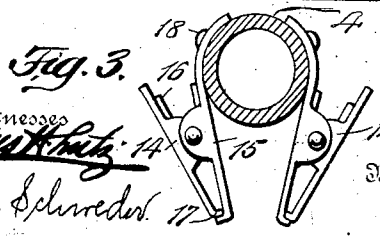


Fig. 3.

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DEVELOPING-FRAME FOR PHOTOGRAPHIC FILMS.

No. 917,940. Specification of Letters Patent. Patented April 13, 1909.

Application filed March 25, 1908. Serial No. 423,160.

To all whom it may concern:

Be it known that I, EDWARD B. HANSBURY, a citizen of the United States of America, and a resident of the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Developing-Frames for Photographic Films, of which the following is a specification.

My invention relates to means for developing photographic films of different kinds, sizes, lengths and styles, the object being to provide a frame for supporting the films in the developing liquid in such a manner that they can be thoroughly and effectively treated without coming into contact with each other, or with the tank, or with anything which might scratch, mar, or injure them, so that they are thus developed in a much more perfect state than has heretofore been possible with the other forms of developing tanks now in common use.

The invention, therefore, consists essentially in a frame for supporting the films; in means for attaching the films to the frame at top and bottom, and in adjusting the frame to films of different lengths; and also it consists in numerous details and peculiarities in the construction, arrangement and combination of parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings illustrating my invention, Figure 1 is a sectional view of a tank with a removable film-supporting frame, shown in operative position within said tank, the frame being shown in side elevation. Fig. 2 is a top plan view showing a couple of frames in position in the tank. Fig. 3 is a cross section of the frame and illustrates one form of spring catch for holding the film.

Similar characters of reference designate corresponding parts throughout all the different figures of the drawings.

1 denotes a tank like that ordinarily used for containing developing chemicals in which photographic films may be immersed for a greater or less time for developing pictures thereon. This tank, which I have illustrated in the drawings, is given simply by way of example and as a single specimen. Its size, shape and material may vary widely. Ordinarily the tank as commonly used at the present time has a plain inside surface, and one of the points of my invention consists in providing the interior of the tank with guides to receive and hold the developing frames. These guides are susceptible of being built in a great variety of ways. In that form which I have selected for illustration, the end parts 1^a of the tank are provided with supplemental pieces 2 secured thereto in some suitable manner, said pieces being formed with a series of parallel grooves 3 which are preferably curved or concave, and which are suitable to receive the developing frames carrying the films. These guiding grooves 3, in the specimen I am explaining, are preferably vertical in order that the developing frames may remain in a vertical position while in the tank. There may obviously be any number of the guiding grooves 3. In the view in Fig. 1, the tank is indicated as broken in half at one point to show that there are more than merely the four guide grooves indicated, and in said figure I have shown two frames occupying two of the grooves, and two grooves which are vacant; but, of course, as already stated, there may be as many guides as desired to accommodate the number of frames which it is desired to employ.

The developing frame which supports the films is clearly illustrated in side elevation in Fig. 1, in top plan view in Fig. 2, and in cross section in Fig. 3. The general shape thereof is preferably rectangular, and it consists of the horizontal upper rail 4, the horizontal lower rail 5, and the two vertical rails 6, which connect horizontal rails 4 and 5, there being some suitable unions or couplings 7 at the corners to unite the parts. These rails 4, 5 and 6 may consist of sections of piping or tubing, and the corner couplings 7 may be internally screw-threaded to receive the ends of the pipes; but while this is a preferable construction, I am not limited thereto, and the rails may be solid, if desired, and the means for fastening them together at the corners may vary widely. Since the tubing and the round shape of the couplings 7 are thought more desirable, the shape of the guiding grooves 3 is made curved or concave to correspond. Opposite to the upper horizontal rail 4 and between it and the lower horizontal rail 5, being usually nearer to the latter, is another horizontal rail 8, having sockets 9, 9, at the ends which engage the vertical rails 6, surrounding the latter partly or wholly and being vertically adjustable thereon by hand, this horizontal rail 8 being consequently adjustable toward and away from the upper horizontal rail 4. The ver

tical rails 6 are provided with series of perforations 10, and the end sockets 9 are also perforated at 11. Pins 12 pass through the perforations 11 and perforations 10, and there being a series of the latter, it is possible to regulate the height of the rail 8 as may be desired, and adjust it closer to or farther away from the top rail 4, and hold it in any desired position of adjustment, the object of so adjusting the rail 8 being to accommodate films of different lengths between them.

The top rail and the movable rail 5 are provided with a suitable number of clasps, clamps, or some other suitable fastening device which will hold the films.

13 designates an example of film held between a fastener on the rail 4, and another fastener on the rail 8, as illustrated in Fig. 1. One form of fastener, which I have illustrated in the drawings merely by way of example, is shown in enlarged detail in Fig. 3, and consists of a spring clasp comprising two interpivoted members 14 and 15 between which is a spring 16 for normally forcing the ends 17 of the clasp toward each other, one member of said clasp, as 15, being longer than the other and being secured to the rail 4, or the rail 8, as the case may be by suitable rivets or other fastening means 18. A clasp like this will tightly grip, between the ends 17 of the members 14 and 15, the film as shown in Fig. 1. In order to enable the frame to hold as many films as possible, I find it convenient to provide the rail 4 and also the rail 8 with two series of clasps, one on each side, as shown in Fig. 3. Two series of films can in this way be stretched between the rail 4 and the rail 8 without coming in contact with each other, and they will be held in a proper position to be effectively acted upon by the chemicals in which they are submerged.

The retaining pins 12 may be used or not as preferred. Oftentimes they will not be needed, for generally the weight of the lower rail 8 will be sufficient to hold the films properly in place. It will also be noted that the lower rail 8, or the upper rail 4, may be divested of clasps, only one rail in this case being provided with them, so that a film which is of unusual length may be carried around over the other rail and held fastened by the clasps on only one of the rails. In this case, as stated, it is better to have the clasps omitted from the rail around which the film passes, in order that there may be no projecting pins to scratch and mar the delicate surface of the negative.

Obviously, the frames may be built for use with short or long films, and hence any particular frame will not require any great amount of adjustment, and for films of unusual length the frame will be built as just suggested with one of the rails, the top one, or the lower one unprovided with clasps. The frame is furthermore furnished at the top with a suitable number of hooks, eyes, or other projecting devices 19, by means of which the frame can be suspended when it is not in the tank.

According to the common process of developing films, they are first placed in a bath of suitable developing chemicals and kept there for, say, twenty minutes; then transferred from that to another bath of hyposulfite of soda, in which they remain a suitable length of time, say, twenty minutes, and then are transferred into a tank containing water, where they are left for a suitable time, say, half an hour. One of these tanks may be provided with guides similar to the guiding grooves 3 to receive and keep in place the film-supporting frames, and said frames will be transferred from one tank to the other as fast as the operation requires. When the frame is in the tank, the unions or couplings 7 at the corners serve as feet on which the frame rests; but in lieu of having two feet thus at the ends of the frame, it may sometimes be found sufficient to have one near the center of the lower rail 5, as I have indicated at 20 in Fig. 1. This is simply suggested as a convenient device.

It sometimes happens that the chemicals used in developing the films will not be absolutely homogeneous at all times throughout the tank, because that nearer the bottom may become heavier through a settling action that may occur, and consequently it may be found advisable to agitate the contents of the tank at certain times for the purpose of securing a uniform and homogeneous quality of the chemical contents throughout. In order to do this most efficiently, I provide the ends of the tank with projecting journals or pins 21 which are adapted to be supported in the bearings of some suitable frame that may be provided (not shown). The tank 1 is also furnished with a cover 22 which can be securely fastened thereon. When the cover is fixedly attached, so that there will be no leakage, and the tank has been supported in the bearings of the frame referred to, it can be revolved a greater or less number of times, and the contents thereof agitated sufficiently to secure entire uniformity, and thus the action on the films immersed in said contents will be exactly the same on every part and the proper developing result will be attained without any difficulty.

Many changes in the precise details of construction and combination may be made without going outside of the legitimate scope of the invention, and I reserve the liberty of making all such changes as may be found desirable and essential in the practical application of my improvements.

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

1. A developing frame for photographic

films, consisting in the combination with a rectangular frame having parallel uprights and parallel connections therefor, between which latter parallel connections the films are adapted to be supported, of means for fastening the films to said parallel connections so that a series of them may be properly supported for immersion in the bath.

2. A film-supporting frame, consisting essentially of a rectangular frame having vertical uprights at the ends and horizontal bars connecting them, an intermediate movable rail between the top and bottom of the frame and adjustable up and down on the uprights, a series of fasteners on the top rail of the frame, and a series of fasteners on the movable rail, all arranged so that a series of films may be supported by means of the fasteners in the frame.

3. The combination with a developing tank having guiding means therein, of one or more developing frames for supporting photographic films and removably placed within the guiding means of the tank, each of said frames consisting of a rectangular frame and a movable intermediate rail, said rail and the top bar of the rectangular frame being provided with clasps for grasping the films between them.

4. The combination in a frame of the class described, of a rectangular structure having a top rail provided with a series of clasps thereon, and a lower rail likewise provided with a series of clasps, vertical side uprights supporting said rails, all arranged so that between the upper and lower rails the films may be carried by means of the clasps.

5. In a frame for developing photographic films, side uprights, upper and lower horizontal connections between them, a movable rail intermediate between the top and bottom rails, and fastening means on the top rail and on the movable rail for holding a series of films, together with means for securing the movable rail at any desired point in its vertical adjustment.

Signed at New York city, this 20th day of March, 1908.

EDWARD B. HANSBURY.

Witnesses:

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