Sept. 16, 1924. 1,508,947

J. O. ALLEN

FILM DEVELOPING, FIXING, AND DRYING FRAME

Filed Oct. 18, 1922

Fig. 1

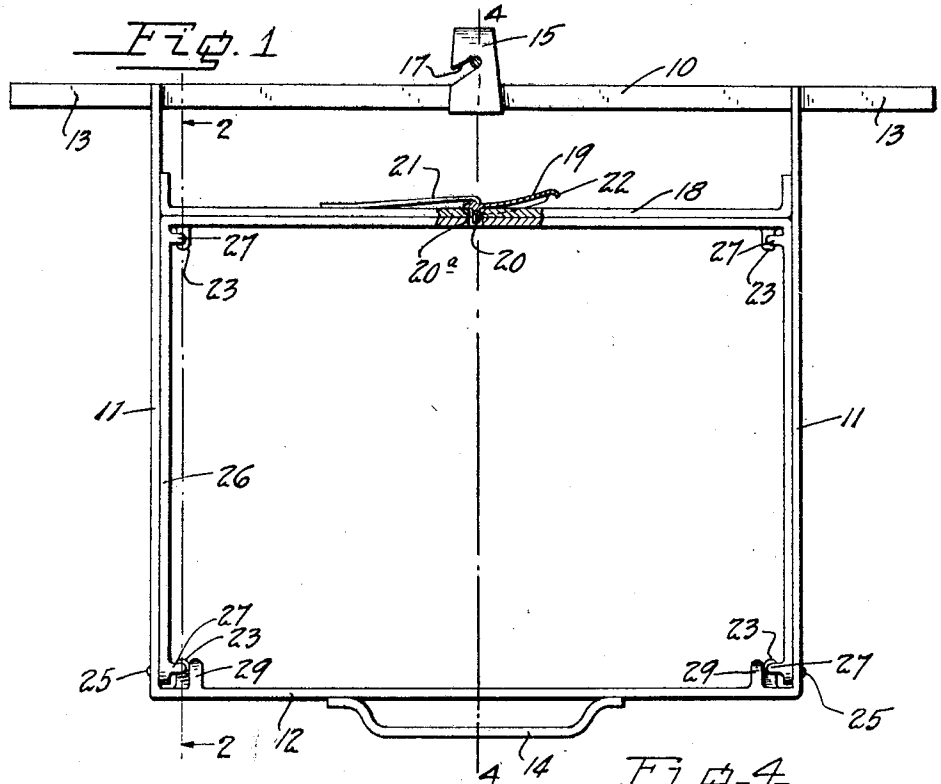


Fig. 4

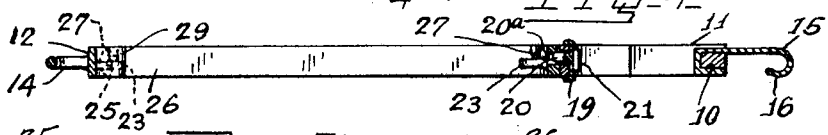


Fig. 2

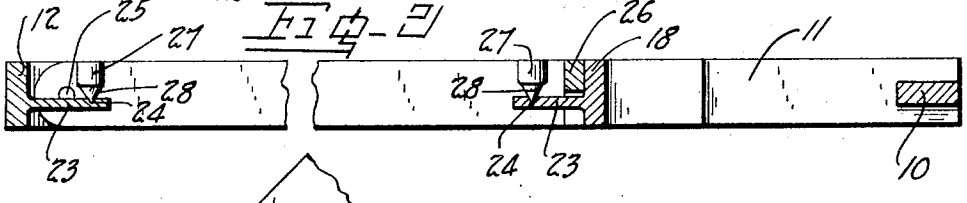
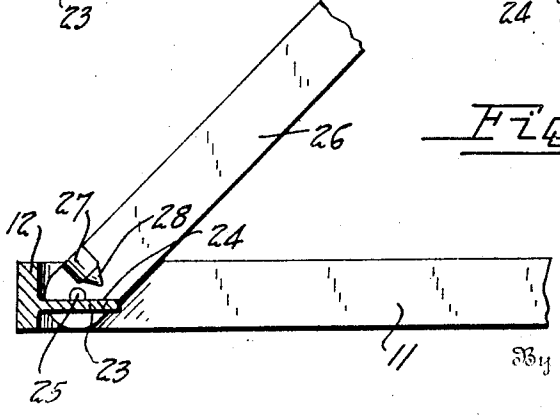


Fig. 3.



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UNITED STATES PATENT OFFICE.

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FILM DEVELOPING, FIXING, AND DRYING FRAME.

Application filed October 18, 1922. Serial No. 595,438.

To all whom it may concern:

Be it known that I, JOHN O. ALLEN, a citizen of the United States, residing at Salt Lake City, in the county of Salt Lake and State of Utah, have invented certain new and useful Improvements in Film Developing, Fixing, and Drying Frames, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to devices for holding photographic films while they are being developed, fixed and dried, and the general object of the invention is to provide a very simple and effective device of this character which will hold the film after it has been exposed while it is being developed within the tank, while it is being fixed, and while it is being dried, and which is so constructed that the film will be clamped firmly at the corners and held stretched and while in this condition may be readily manipulated.

A further object is to provide a means for supporting the film and frame while the film is being inserted in the frame which will prevent all danger of the film being scratched and which will positively guide the film into proper position within the frame.

Still another object of the invention is to provide a frame of this character so constructed that the frame with the film in it may be readily hung up to dry in such position that the frames are arranged in series, either one behind the other or one beside the other, and which is further so constructed that another frame may be hung from the first named frame.

Another object is to so construct the film holder that the film cannot become damaged and will be held securely in place during the operations referred to.

Figure 1 is an elevation of one of the film holding frames;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a fragmentary section on the same line as Figure 2 but showing the clamping frame raised;

Figure 4 is a section on the line 4—4 of Figure 1.

Referring to Figure 1, it will be seen that the frame is rectangular in general form and comprises a cross bar 10, end bars 11, and a cross bar 12. The cross bar 10 has a length greater than the cross bar 12 so that it projects out at the ends, as at 13. The cross bar 12 is provided at its middle with a longitudinally extending loop or hanger 14, and the cross bar 10 at its middle is provided with the hook 15 made of sheet metal and bent upon itself to provide a bill 16, the shank of this hook being formed with an upwardly extending slot 17.

Extending transversely of the frame parallel to the bars 10 and 12 and disposed below the cross bar 10 is the cross bar 18 (see Figs. 1 and 2). This is formed at its middle with a perforation, and mounted upon the cross bar is a latch 19 having a stud 20 which is adapted to project through the perforation in the cross bar 18, this latch being urged to its operative position by means of a spring 21. The latch is so formed as to provide a finger piece 22 whereby the latch may be retracted.

At the corners of the frame formed by the cross bars 12 and 18 and by the end bars 11 are formed the inwardly projecting lugs 23 which are disposed on a level with the lower edge faces of the frame, these lugs 23 having slight depressions 24 formed in their upper faces. Pivoted to the lower ends of the end bars 11 by pivots 25 is a rectangular clamping frame 26 which is provided adjacent its corners with inwardly projecting lugs 27 having downwardly projecting prongs 28. These are so located that when the clamping frame 26 is turned down flush with the outer frame formed by the members 11, 12 and 18, the prongs 28 will enter the recesses or depressions 24. Projecting from the upper edge of the cross bar 12 are inwardly projecting guide tongues 29 which are located slightly inward of the lugs 23.

The clamping frame above described is designed to be used in connection with a loading frame or block, as is usual with film clamping frames of this general character.

In the use of this device, the inner frame 26 is raised and the frame is disposed upon a loader or holder. The film is then disposed upon the upper face of the block between the guards 36 and below the guides 29. Thus the film is centered with its corners disposed between the lugs 24 and the lugs 27. These lugs 24 and 27 constitute the jaws and when the inner frame is closed down flush with the outer frame, the prongs

28 will pierce the film at the corners and these jaws will hold the film firmly within the frame. When the inner frame is closed down, the latch, bolt or stud 20 enters an aperture 20^a in the inner frame and locks the inner frame in its closed position. The frame with the film in place may then be supported upon the tank by the downwardly projecting portions 13 of the cross bar 10 and the film may then be developed, fixed, washed and dried in the usual manner, during which operations the film is held flat and in such condition as to be readily observed at any time and readily manipulated.

After the film has been developed, fixed and washed, it may be dried by hanging the film holder up. The film holders may be disposed in a series side by side upon a wire or rod by hanging the film holders on the rod with the rod or wire passing through the slots 17 in the film holders, or the bills 16 may be passed over a wire or rod and the film holders hung up one after another end to end. The loop 14 permits other film holders to be hung below the first film holder and thus a very large number of film holders may be readily supported within the dark room or other laboratory.

It will be seen that this device embodies an outer supporting frame and a film clamping frame pivoted in the outer frame and adapted to be turned down to clamp the corners of the film. The device is very simple and convenient and permits the film to be manipulated without any danger of scratching or otherwise injuring the film during the manipulations incident to developing, washing, fixing and drying.

While I have illustrated an embodiment of my invention which I have found to be very effective in practice. I do not wish to be limited thereto, as it is obvious that many changes might be made in the details of construction and arrangement of parts without departing from the spirit of the invention.

I claim:—

1. A film holder comprising a rectangular supporting frame having supporting means, a rectangular clamping frame within the supporting frame and pivoted thereto, coacting film engaging jaws projecting inward from the supporting and clamping frames, and means for latching the clamping frame within and parallel to the supporting frame.

2. A film holder comprising a rectangular supporting frame having supporting means, a rectangular film clamping frame fitting within the supporting frame and pivoted at one end thereto, the supporting frame and the clamping frame having coacting film clamping jaws projecting inward therefrom and adjacent the corners thereof, and means for latching the film clamping frame within and parallel to the supporting frame and with the jaws closed.

3. A film holder comprising a rectangular supporting frame comprising end bars, a cross bar at one end of the end bars, a cross bar at the opposite end of the end bars and projecting beyond the end bars and having a supporting hook, a cross bar disposed inward of the last named cross bar and having inwardly projecting, film clamping jaws, the first named cross bar having inwardly projecting, film clamping jaws, and a clamping frame pivoted to the end bars adjacent the first named cross bar for movement into or out of flush relation to the supporting frame, the clamping frame having inwardly projecting, film clamping jaws coacting with the jaws on the supporting frame, and a latch for holding the clamping frame locked in flush relation with the supporting frame.

4. A film holder comprising a rectangular supporting frame comprising end bars, a cross bar at one end of the end bars, a cross bar at the opposite end of the end bars and projecting beyond the end bars and having a supporting hook, a cross bar disposed inward of the last named cross bar and having inwardly projecting, film clamping jaws, the first named cross bar having inwardly projecting, film clamping jaws, a clamping frame pivoted to the end bars adjacent the first named cross bar for movement into or out of flush relation to the supporting frame, the clamping frame having inwardly projecting, film clamping jaws coacting with the jaws on the supporting frame, and a latch for holding the clamping frame locked in flush relation with the supporting frame, the first named cross bar of the supporting frame having an elongated, outwardly projecting loop.

5. A film holder comprising a rectangular supporting frame including end bars, a cross bar at one end of the end bar, a second cross bar at the opposite end of the end bars and projecting laterally beyond the same at each end, an intermediate cross bar disposed adjacent the last named cross bar and having a latching device, a rectangular clamping frame pivoted to the end bars adjacent the first named cross bar, the first and third named cross bars having inwardly projecting, film engaging jaws, and the clamping frame having coacting inwardly projecting, film clamping jaws and the first named cross bar having inwardly projecting film guides disposed above but laterally spaced from the adjacent jaws.

In testimony whereof I hereunto affix my signature.

JOHN O. ALLEN.