

April 24, 1928.

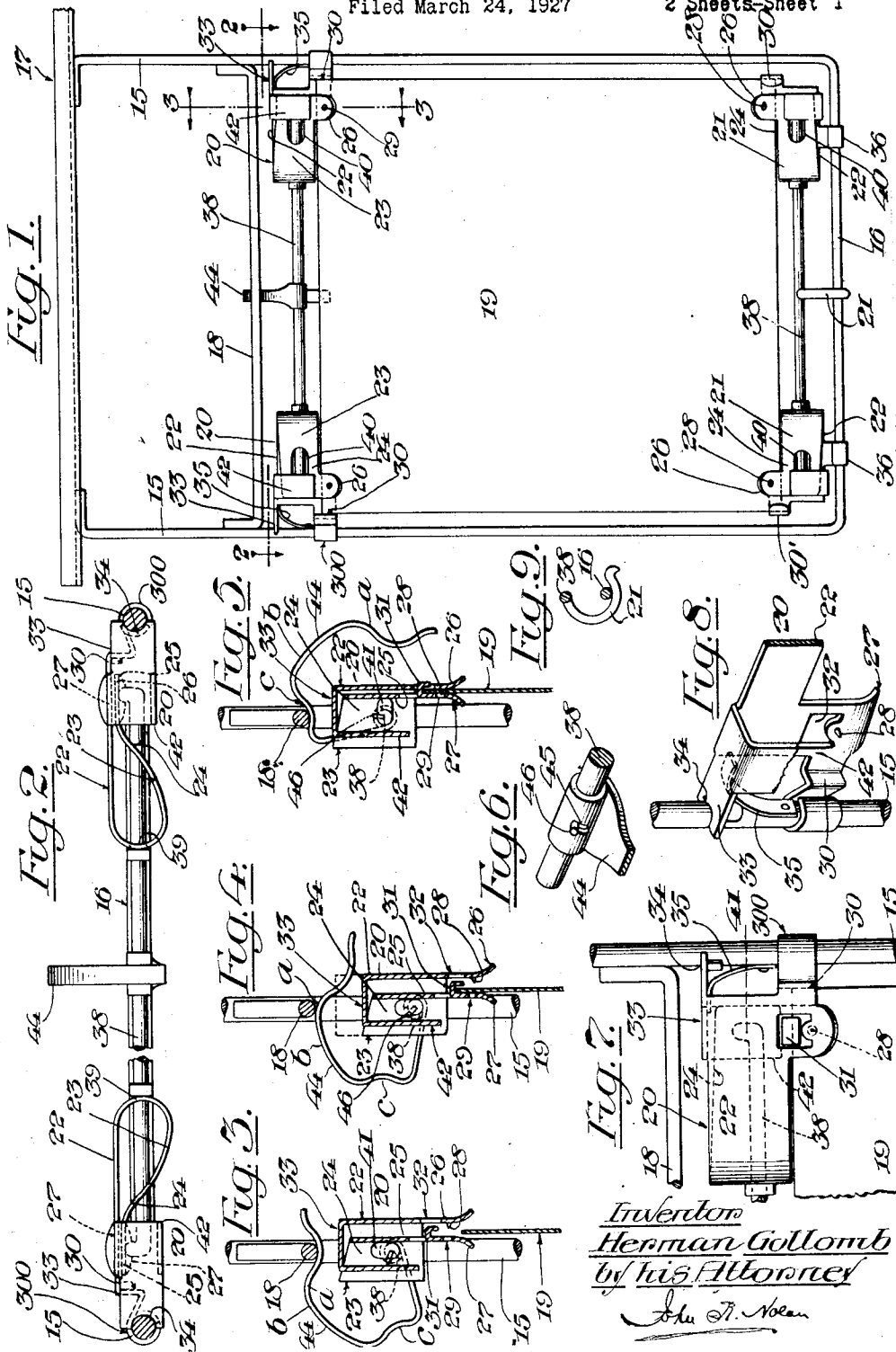
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PHOTOGRAPHIC FILM HANGER

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2 Sheets-Sheet 1



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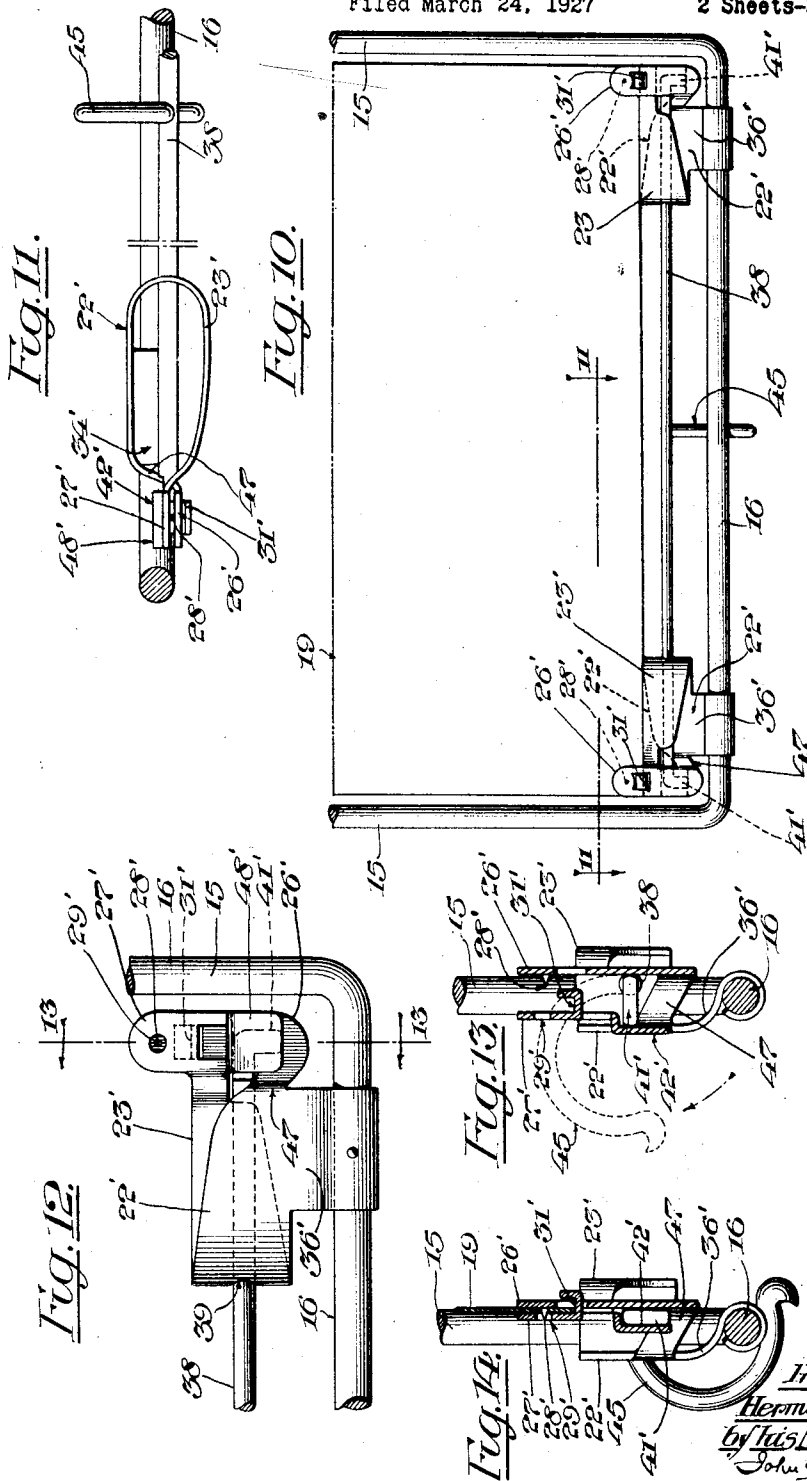
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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PHOTOGRAPHIC-FILM HANGER.

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This invention relates to photographic film hangers, having reference especially to that class of hangers whereby photographic films, during the developing and drying stages, are held in an open frame by means of spring clips arranged and designed to engage the respective end corners of the film.

As heretofore constructed such clips have been difficult to manipulate to effect the clamping and releasing of the film, in that it was necessary to manipulate the springs individually by thumb pressure, and hence, where many films were being treated in a large developing plant, the work of the operator became laborious and irksome. Moreover much skill was required to ensure the accurate positioning and clamping of the film.

An object of my invention is to provide a novel construction and arrangement of the film holding clips within the frame and combine therewith simple and efficient actuating devices which can be manipulated with ease and facility to open or close the clips for the purpose of gripping or releasing the film.

Another object of my invention is to provide a novel arrangement of stops for ensuring the accurate positioning of the edges of the films in the clips.

Another object of my invention is to provide a novel means for separating or stripping the edges of the film from the pins and jaws of the clips.

Another object of my invention is to provide a construction whereby the film is maintained under uniform longitudinal tension within the supporting frame.

With these and other objects in view my invention comprises novel features of construction and combinations of parts which will be hereinafter described, and the scope of the invention then be defined in the appended claims.

In the drawings—

Figure 1 is a front elevation of a photographic film hanger embodying my invention, showing a film as supported thereby.

Fig. 2 is a transverse horizontal section through the hanger, as on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section through one of the upper clips, and adjuncts, as on the line 3—3 of Fig. 1, but showing the clip in normal raised and open condition.

Fig. 4 is a similar view, but showing the open clip depressed and embracing the edge of the film, preparatory to the closure of the clip.

Fig. 5 is a similar view, but showing the clip as engaged with the film and yieldingly raised and locked.

Fig. 6 is a perspective view of the cam lever connection for actuating the upper clips.

Fig. 7 is an elevation of one of the upper clips and adjuncts.

Fig. 8 is a perspective view from the rear of a portion of one of said clips.

Fig. 9 is a section through the lower portion of the frame showing the latch lever for the adjacent rocker shaft which controls the operative position of the clips.

Fig. 10 is a front elevation of the lower portion of the hanger showing a modified form of the clips as engaged with a film.

Fig. 11 is a partial horizontal section, enlarged, as on the line 11—11 of Fig. 10, but showing the clip in normal or closed position and the film omitted.

Fig. 12 is a rear elevation of one corner of the hanger showing the adjacent clip.

Fig. 13 is a vertical section through the clip, as on the line 13—13 of Fig. 12.

Fig. 14 is a similar view showing the clip in closed or clamping position.

As illustrated in the drawings the hanger comprises an open rectangular frame embodying side bars 15, a bottom bar 16 and a top bar 17, the latter bar having end extensions which afford suspension members, as usual. The side bars are connected at their upper portions by a cross-bar 18 which is spaced somewhat below the top bar. The film, as 19, to be treated is supported between the cross-bar 18 and the bottom bar of the frame by means of upper and lower pairs of clips 20, 21, respectively, which are associated with the frame and are arranged and designed to receive and grip the upper and lower edges of the film, at the corners, in a manner to maintain the film efficiently under slight tension. The clips are substantially similar in construction and operation saving as to formal variations incident to their right and left hand positions within the frame, as will hereinafter appear.

Each of the clips, in the preferred construction illustrated, comprises a piece of relatively thin resilient metal appropriately formed and bent into substantially U-shape

to provide a fixed body portion 22 and a forward spring member 23, the latter having an inwardly inclined portion 24 terminating in a foot portion 25 parallel to and normally separated from the body portion. The body 22 and the free end portion 25 of the member 23 are formed with substantially parallel extensions which constitute complementary clamping jaws 26, 27, respectively. These jaws in the case of each of the upper clips extend downwardly and in the case of each of the lower clips extend upwardly, as shown. The free ends of the jaws 26, 27 are preferably flared to facilitate the entry therebetween of the adjacent horizontal edge of the film. One of the jaws of each clip is preferably provided with a point or teat 28 which is arranged and adapted to engage and firmly hold the opposing surface of the film, the companion jaw having therein a suitable opening 29 to accommodate the point. The jaw 27 of each of the upper clips is provided at its outer edge with an extension which is bent at right angles, or substantially so to the plane of the jaw, as at 30, to afford a guide and stop for the adjacent lateral edge of the film, and which extension is also suitably bent and formed with an eye 300 which is slidably fitted to the adjacent side bar 15 of the frame. The jaw 27 of each of the lower clips is provided at its outer edge with a curved lip 30' which serves as a guide and stop for the adjacent lateral edge of the film. Each of the free end portions 25 of the member 23 has struck therefrom an angular tongue 31, which is spaced from the body 22 when the clamping jaws are open, such body having therein an opening 32 to permit the free passage of the tongue therethrough during the closing and opening of the jaw 27. The tongue 31 of each of the lower clips affords a stop for the opposing edge of the film when it is positioned between the jaws, and the vertical lip of each lower and upper clip pulls the film from the adjacent pin 28 when the jaw 27 is opened preparatory to the removal of the film. Moreover, in the event of the adherence of the film to a jaw 26, the proximate vertical lip strips the film from the jaw.

The outer end of the body portion 22 of each of the upper clips is formed with a horizontal overhanging portion 33 which is recessed, as at 34, and slidably fitted to the adjacent side bar 15 of the frame. The free upper end of a leaf spring 35, which is secured at its lower end to the adjacent side bar 15, bears against the under side of the portion 33 and tends to maintain the clip yieldingly in raised position.

In the case of each of the lower pair of clips the body portion 22 is formed with a suitably-disposed depending tongue 36 terminating in an eye which tightly engages the

bottom cross-bar 16 of the frame. By this construction the lower clips 21, which receive the lower edge of the film, are fixedly secured to the frame, while the resiliently supported upper clips, which receive the upper edge of the film, are vertically movable below the cross-bar 18. Hence when the upper clips are lowered against the pressure of the springs 35 and engaged with the adjacent edge of the film, they tend to pull the film upward and maintain it under uniform tension.

Simple and efficient means are provided whereby the clips of each pair are simultaneously actuated either to clamp or to release the adjacent edge of the film positioned within the frame. The preferred means for this purpose comprises a transverse rocker shaft 38 which extends through perforations 39 in the curved ends of the respective clips and through slots 40 in the inclined portions 24 of the spring members 23. Each end of the shaft is provided with a cam or pressure member 41 which is interposed between the outer face of the yielding end portion 25 of the adjacent clip and a depending tongue 42, which is spaced from such portion 25, and which tongue is preferably formed on or secured to the body of the clip. The cam members 41 at the respective ends of the shaft 38 are so formed and positioned that when the rod is partially turned in one direction said cam members bear against the opposing clip portions 25 and force them, against the spring action, toward the respective bodies 20, thereby pressing the respective jaws 26, 27 against the proximate edge of the film in a manner to clamp the latter firmly in place. The rocker shaft has fixed thereto, midway between its ends, one end of a latch lever 44, by the manipulation of which the shaft may be readily operated to effect the film clamping or the film releasing action of the clips. This lever is formed with a curved cam portion, which in the case of the lower shaft 38 bears against the upper surface of the bottom frame bar 16 when the lever is swung downwardly and rearwardly, and which lever in the case of the upper shaft 38 bears against the under side of the cross-bar 18 when the lever is swung upwardly and rearwardly.

The lower lever is fast on the lower shaft, and the contour of the cam surface of this lever is such that its frictional contact with the bar 16, when the lever is moved sufficiently to effect the clamping of the lower edge of the film by the clips 21, holds the parts in effective clamping relation. To release the lower edge of the film from the grasp of the clips 21 it is merely necessary to swing the lower lever forcibly outward from engagement with the frame bar.

The upper lever is mounted on the upper

shaft 38 so as to have slight relative movement thereon, and to this end the hub of the lever has therein an arcuate slot 45 for the passage of a stop pin 46 projecting from the shaft. The contour of the cam surface of this lever is such that when the lever is swung upwardly and rearwardly an inclined portion *a* of such surface bears against the opposing cross-bar 18 in a manner to force the shaft 38 and its clips 20 downward against the action of the springs 35 until the open jaws 26, 27 of said clips embrace the upper edge of the film, as seen in Fig. 4, which film has previously been clamped at its lower edge by the clips 21. In this movement the lever turns freely on its shaft by virtue of the pin and slot connection. This done a concentric portion *b* of the cam contacts with the cross-bar, and the shaft and its clips are thereby maintained at their lower level for a brief interval, during which the trailing end of the slot 45 bears against the pin 46 and partially turns the shaft 38 so as to close the jaws 26, 27, as seen in Fig. 5, thereby clamping the interposed edge of the film and causing the points 28 to pierce the latter. The concentric portion *b* of the cam terminates in a depression or socket *c* which, when it is brought beneath the cross-bar 18, is engaged by the latter by virtue of the slight upward movement of the shaft and clips by the retractive effect of the springs 35. The film is thus maintained uniformly taut and the upper shaft 38 is effectively held in clamping relation to the clips.

To release the upper edge of the film from the grasp of the clips 20 it is merely necessary to swing the upper lever forcibly outward from the cross-bar 18; whereupon the said clips are automatically opened and raised above the film.

In Figs. 10 to 14, inclusive, of the drawings, a modified form of film holding and releasing clip is shown as applied to the bottom bar of the hanger frame. In this form the clip is normally closed by its inherent elasticity and the rocker-shaft 38 is operative to open the companion clips or to permit them to close. The spring metal blank from which each clip is formed is bent or folded to provide the front and rear members 22', 23', respectively. The rear member is formed with a depending retaining piece 36' which is secured to the frame bar 16, and which piece is formed with an extension 47 that projects below and forwardly of the front member, terminating in a fixed vertical jaw 26' having on its inner face a point 28'. The free end of the forward or spring member is offset and inclined so as to cross the extension 47, terminating in a vertical jaw 27' which is normally separated from the jaw 26', as seen in Fig. 13. The jaw 27' is provided with an inwardly extending and up-turned stripper lip 31'

which is adapted to receive and support the lower edge of the film 19 when it is interposed between the jaws, and this jaw 27' is also provided with an orifice 29' to accommodate the point 28' when the movable jaw 27' is closed to clamp the film. The jaw 27' is also formed with an offset portion 42' against which bears a cam member 41' on the end of the rocker shaft 38, which member is so formed and disposed that when the shaft is partially turned by actuation of the lever 45 the spring jaw 27' is forced outward. The lever 45 on the shaft engages the bottom bar 16 of the frame and latches the jaw 27' in open position, thus permitting the ready positioning of the edge of the film between the jaws. When the film is seated in the two clips and the lever is unlatched the spring jaws automatically close and grasp the film.

It is to be understood that my invention is not limited to the particular illustrative constructions herein disclosed, as the same may be modified within the principle of the invention and the scope of the appended claims.

I claim—

1. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, the jaws of the respective clips being held by spring action in a normal position, and means for simultaneously actuating said clips in opposition to the spring action and locking them in abnormal position.

2. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, the jaws of the respective clips being held by spring action in a normal position, and means for simultaneously actuating said clips in opposition to their spring action and locking them in abnormal position, said means comprising a transverse shaft having cam portions which co-act with the respective clips and having also a latch member arranged in co-operative relation to an adjacent portion of the frame.

3. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, the jaws of the respective clips being held by spring action in a normal position, and means for simultaneously actuating said clips in opposition to their spring action and locking them in abnormal position, said means comprising a transverse shaft having its bearings in the said clips and having cam portions which co-act with the respective clips, and having also a latch member arranged in co-operative relation to an adjacent portion of the frame.

4. A film hanger comprising a frame hav-

ing a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, each of said clips comprising a piece of spring metal bent substantially U-shape and having complementary clamping jaws whereof one is in yielding relation to the other jaw, a transverse shaft having end cams which by partial rotation of the shaft co-act with the yielding jaws of the respective clips to move them against their spring action, and means for locking the shaft in its partially rotated position.

5. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, each of said clips comprising a piece of spring metal bent substantially U-shape and having complementary clamping jaws whereof one is in yielding relation to the other jaw, a transverse shaft having end cams which by partial rotation of the shaft co-act with the yielding jaws of the respective clips to move them against their spring action, and an operating latch member on said shaft adapted to engage an adjacent portion of the frame when the shaft is partially rotated.

6. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, each of said clips comprising a piece of spring metal bent substantially U-shape and having complementary clamping jaws whereof one is in yielding relation to the other jaw, a transverse shaft having end bearings in the bows of said clips and having cam portions which by partial rotation of the shaft co-act with the yielding members of the respective clips to move them against their spring action, and means for locking the said shaft in the partially rotated position.

7. In a film hanger, a frame including side bars and a rigid cross-bar, a plurality of spaced-apart spring clips to receive and clamp the upper edge of a film to be treated, the jaws of the respective clips being held by their spring action in a normal position, means for resiliently supporting said clips below the cross-bar, and means for forcibly depressing said clips and also simultaneously actuating them in opposition to their spring action, said means including a latch member which co-operates with the said cross-bar.

8. In a film hanger, a frame including side bars and a rigid cross-bar, a plurality of spaced-apart spring clips to receive and clamp the upper edge of a film to be treated, the jaws of the respective clips being held by their spring action in a normal position, means for resiliently supporting said clips below the cross-bar, and means for forcibly depressing said clips and simultaneously actuating them in opposition to their spring action, said means including a shaft having clip actuating portions, a latch member mounted on said shaft and having a cam surface which co-operates with the cross-bar to force the shaft and the clips downward until the clips embrace the upper edge of the film, and then effects the closure and locking of the clips.

9. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, the jaws of the respective clips being held by spring action in a normal position, each of said clips having a lateral edge stop for the film, and means for simultaneously actuating said clips in opposition to the spring action and locking them in abnormal position.

10. A film hanger comprising a frame having a plurality of spaced-apart spring clips arranged and adapted to receive and clamp an edge of a film to be treated, the jaws of the respective clips being held by spring action in a normal position, each of said clips having a stripper member for engaging the edge of the film, and means for simultaneously actuating said clips in opposition to the spring action and locking them in abnormal position.

11. In a film hanger, a spring clip having complementary clamping jaws, whereof one is in yielding relation to the other jaw, one of said jaws having a stripper tongue which engages an edge of the film.

12. In a film hanger, a spring clip having complementary clamping jaws, whereof one is in yielding relation to the other jaw, one of said jaws having an angular tongue struck therefrom to afford a stripper for an edge of the film, the other jaw having a clearance opening for the said tongue.

Signed at New York in the county and State of New York this 23d day of March A. D. 1927.

HERMAN GOLLOMB.