April 19, 1932. H. GOLLOMB 1,854,931

PHOTOGRAPHIC FILM HANGER

Filed Jan. 15, 1930

Fig. 1.

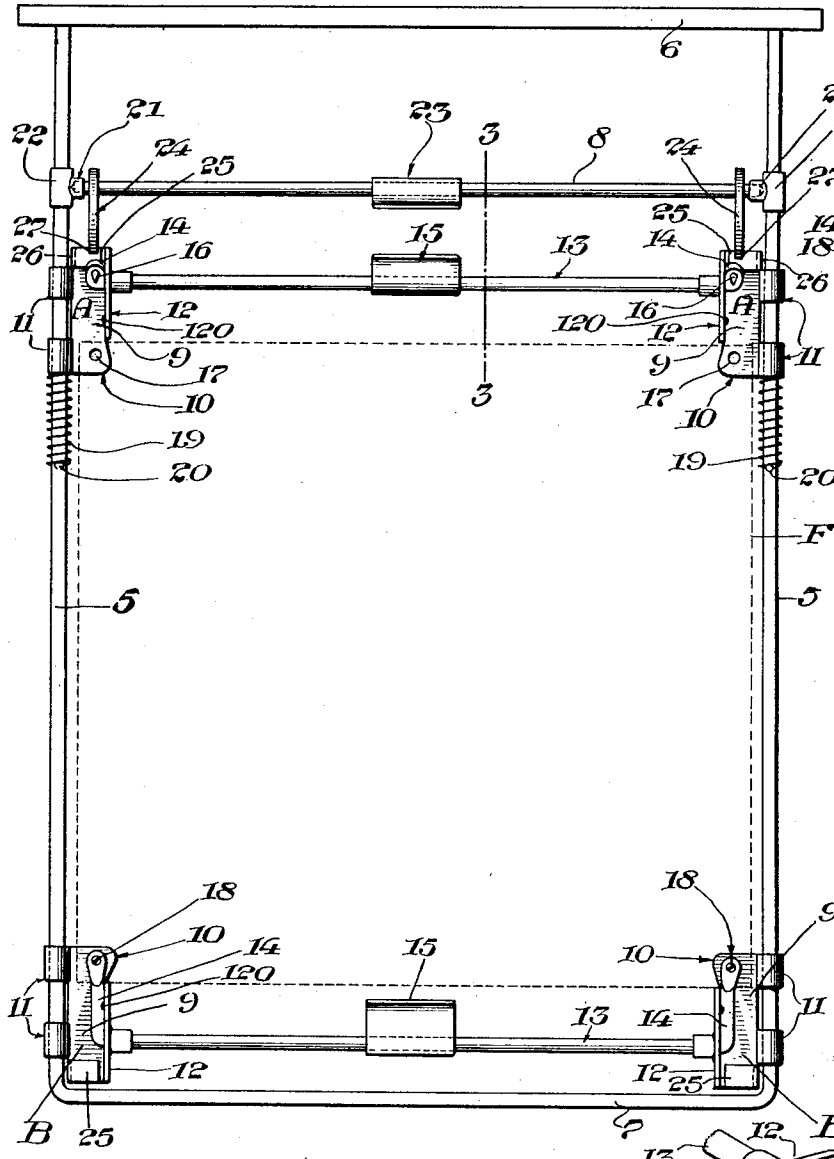


Fig. 2.

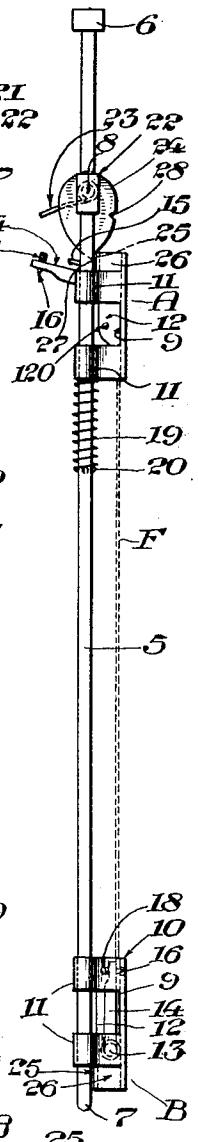


Fig. 3.

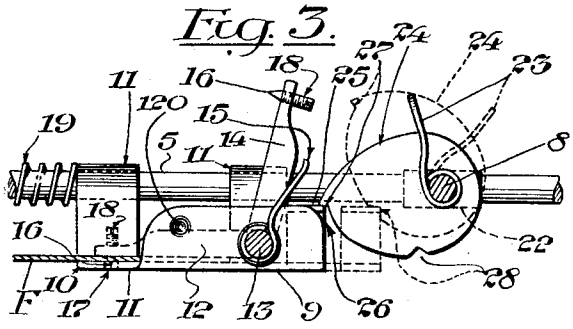
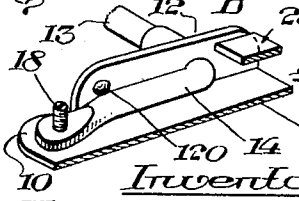


Fig. 4.



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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, and has for its object to provide a hanger of simple and efficient construction and operation whereby a film can be mounted in or removed from the hanger with celerity, which film when thus mounted is uniformly maintained under resilient longitudinal tension.

The invention, generally stated, embodies, in a hanger frame, a novel construction of paired film holding clamps arranged at the top and bottom respectively of the frame, and means for relatively actuating the clamps to accomplish the efficient clamping and tensioning of the film, or the subsequent release of the film, the operation in each case being effected with facility and dispatch, as will be hereinafter described; the scope of the invention then being defined in the appended claims.

In the drawings—

Figure 1 is a front elevation of a photographic film hanger embodying a preferred form of my invention, a film being indicated in dotted lines as positioned therein and clamped at its lower edge preparatory to the clamping and tensioning of the upper edge of the film.

Fig. 2 is a side elevation of the hanger with the parts in the relative positions shown in Fig. 1.

Fig. 3 is a partial section of the upper portion of the hanger, adjacent one of the upper clamps, as on the line 3—3 of Fig. 1, indicating by dotted lines the relative positions of the clamp and its associated cam when the film is clamped and under tension.

Fig. 4 is a sectional detail of one of the clamps.

The hanger illustrated embodies an open rectangular frame comprising side bars 5 and top and bottom cross-bars 6, 7, respectively. Spaced below and parallel with the top bar 6 is a transverse rock-shaft 8, between which and the bottom cross-bar 7 a film (F), to be developed and printed, is supported at its respective upper and lower corners by means of upper and lower pairs of clamps A, B, respectively. The clamps are substantially similar in construction and operation saving as hereinafter particularly pointed out. Each of the clamps, in the preferred construction, comprises a basal plate 9 extending longitudinally of the adjacent side bar of the frame and having at its inner end a projecting jaw portion 10, and also having at its outer edge tubular projections 11 through which the side bar extends. In the case of the lower clamps the projections are fixedly secured to the respective side bars, and in the case of the upper clamps the projections are slidable within limits on the side bars. The inner edges of the plates 9 of each pair of clamps are formed with forwardly-projecting flanges 12 the inner ends of which are spaced from the adjacent ends of the respective plates to permit the seating of the edge of the film on the jaws 10. These flanges afford bearings for a transverse rock-shaft 13, the ends of which have formed thereon, or otherwise fixed thereto, angular arms 14 constituting jaw members which are so disposed that they can be moved into and out of clamping relation to the respective basal jaws 10 by proper actuation of the associated shaft 13. Each shaft 13 is provided intermediate its ends with a suitable thumb-piece 15 to facilitate its manipulation. The acting ends of the arms 14 are flattened and provided with points 16 adapted to penetrate and hold the adjacent edge of the film, at its corners, when such edge is applied to the lower jaws 10 and the associated movable jaws 14 are clamped thereon.

The jaws 10 are formed with apertures 17 to receive the points, which points are preferably formed by the pointed ends of small screws 18 which are fitted in tapped holes in such jaws, thus permitting removal, re-sharpening and replacement of the points, as well as their nice adjustment in respect to the film, as occasion may require.

The flanges 12, which are laterally resilient, bear against the inner sides of the arms 14, thus serving to maintain the arms in their respective active and inactive positions with respect to the basal jaws. The flanges are preferably provided with suitably-disposed punched projections 120 which normally project slightly into the paths of the respective arms 14 so as to engage the opposing

sides of the arms and temporarily lock them in down or clamping position. When the arms are forcibly swung upward by actuation of the thumb-pieces 15 the arms bear against the projections 120 and press them outward in opposition to the inherent elasticity of the respective flanges so as to release the arms.

The upper pair of clamps (A), and the actuating rock-shaft 13 therefor, are yieldingly held in a normal or raised position by means of springs 19 which, encircling the respective side bars 5 of the frame, bear at their lower ends against stops 20 on the bars and at their upper ends against the opposing slidable projections 11 of the upper jaw plates 9.

The upper rock-shaft 13 is spaced below and parallel to the rock-shaft 8, previously referred to, which latter shaft has its bearings 21 in suitable fixtures 22 on the respective side bars 5 of the frame, and is provided with a suitable thumb-piece 23. The shaft 8 is equipped at its respective ends with suitable cam plates 24 whereof the acting edges are movable, by proper operation of the shaft 8, into contact with opposing lips or flanges 25 formed at the outer ends of forwardly projecting lugs 26 on the respective upper jaw plates 9, thus forcing said plates, and their appurtenances slightly downward against the pressure of the springs 19.

Each of the cams 24 is provided with a spaced-apart toe 27 and notch 28 which coact with the opposing lip or flange 25 of the associated clamp at the respective limits of movement of the cam, thus temporarily locking the clamp in each of its extreme positions longitudinally of the frame.

The operation of the hereinbefore described film hanger is as follows:

Assuming the movable jaws 14 of the respective pairs of clamps be open, and the upper pair be held downward against the action of the springs 19 by the cams 24, the lower edge of the film to be developed and dried is placed on the projecting jaws 10 of the lower clamps B and in contact with the opposing inner ends of the flanges 12, which flanges thus contribute to the accurate placement of the film edge. The lower pair of jaws 14 are then swung down upon the film by manipulation of the thumb-piece 15 of the adjacent rock-shaft 13, thereby securely clamping the lower edge of the film. This done, the upper edge of the film is placed on the jaws 10 of the upper clamps A and in contact with the opposing inner ends of the flanges 12, whereupon the upper pair of swinging jaws 14 are moved down upon the film by manipulation of the thumb-piece 15 of the adjacent rock-shaft 13. Finally, the cams 24 are thrown upward against the pressure of the springs 19, by actuation of the thumb-piece 23 of the rock-shaft 8. Coincidentally, the upper pair of clamps and their shaft 13 are forced upward by the action of the springs 19, thereby yieldably pulling the upper end of the film and exerting longitudinal tension thereon in opposition to the holding action of the lower pair of clamps at the lower end of the film. Hence the film is effectually held at its four corners and maintained under uniform resilient tension.

To release the film, the frame is held in horizontal position, the cams 24 are manipulated to move the upper pair of clamps in opposition to the action of the springs 19, and the two thumb-pieces 15 are properly manipulated to throw the respective pairs of jaws 14 upward, thus simultaneously releasing the four corners of the film. This done, the frame is inverted, thus permitting the film to drop bodily from the frame.

It is to be understood that my invention is not limited to the particular illustrative construction 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, a plurality of spaced-apart clamp elements, each including a base having a clamping portion in fixed relation thereto, and a relatively movable clamping member having a complementary clamping portion adapted to bear directly on the edge of a film imposed on the basal clamping portion, and a single actuating means fixedly connecting to the plural movable clamping members and operative to move them simultaneously into or out of clamping relation to the respective basal clamping portions.

2. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal jaw member mounted on the frame and a relatively movable jaw member co-acting with said basal member and adapted to bear directly on the film, and a transverse operating member mounted on the basal members of the respective clamps and fixed to and carrying the movable jaw members.

3. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal jaw member mounted on the frame, and a relatively movable jaw member co-acting with said basal member and adapted to bear directly upon the film, said jaw member having a removable adjustable point thereon arranged and adapted to engage the film, and a transverse operating member mounted in the basal members of the respective clamps and fixed to and carrying the movable jaw members.

4. A film hanger comprising a frame, a plurality of spaced-apart clamp elements, each including a base having a clamping por-

tion in fixed relation thereto, and a relatively movable member having a complementary clamping portion adapted to bear directly on the edge of a film imposed on the basal clamping portion, means connecting the plural movable members and operative to move them simultaneously into or out of clamping relation to the respective basal clamping members, a rock-shaft mounted on the sides of the frame in spaced relation to the clamps, resilient means normally urging the said clamps toward the rock-shaft, and means actuable by the rock-shaft to move the clamps away from or permit their resilient retraction toward said rock-shaft.

5. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal member slidably mounted on the frame and a relatively-movable jaw member co-acting with said basal member, a transverse operating member mounted on the basal members of the respective clamps and fixed to and carrying the movable jaw members, a rock-shaft mounted on the frame in spaced relation to the clamps, resilient means normally urging the said clamps toward the rock-shaft, and means actuable by the rock-shaft to move the clamps away from or permit their resilient retraction toward said rock-shaft.

6. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal member slidably mounted on the frame and a relatively-movable jaw member co-acting with said basal member, a transverse operating member for the movable jaw members, a rock-shaft mounted on the frame in spaced relation to the clamps, resilient means normally urging the said clamps toward the rock-shaft, and cams mounted on said rock-shaft in co-operative relation to the basal members of the respective clamps, whereby said cams, by proper actuation of the rock-shaft, move the clamps away from or permit their resilient retraction toward the said rock-shaft.

7. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal member slidably mounted on the frame and a relatively-movable jaw member co-acting with said basal member, a transverse operating member for the movable jaw members, a rock-shaft mounted on the frame in spaced relation to the clamps, resilient means normally urging the said clamps toward the rock-shaft, and cams mounted on said rock-shaft in co-operative relation to the basal members of the respective clamps, whereby said cams, by proper actuation of the rock-shaft, move the clamps away from or permit their resilient retraction toward the said rock-shaft, said cams and basal members having co-acting portions to limit the movements of the clamps.

8. A film hanger comprising a frame, including side bars, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, said clamps each including a basal member slidably mounted on the adjacent side bar of the frame and a relatively-movable jaw member co-acting with said basal member, a transverse operating member for the movable jaw members, a rock-shaft mounted on the frame in spaced relation to the clamps, springs on the side bars normally urging the said clamps toward the rock-shaft, and means actuable by the latter shaft to move the clamps a limited distance from or permit their resilient retraction toward said rock-shaft.

9. A film hanger comprising a frame, spaced pairs of clamps therein arranged and adapted to receive and clamp the respective corners of a film, one pair of clamps being fixed in relation to the frame and the other pair being bodily movable, within limits, longitudinally of the frame, an operating member for each pair of clamps whereby either pair can be simultaneously operated either to grip or to release the film, resilient means whereby the movable pair of clamps are normally positioned to exert longitudinal tension on the film gripped thereby, a rock-shaft mounted on said frame in spaced relation to the operating shaft for the movable pair of clamps, and means actuable by said rock-shaft to move the latter clamps away from or permit their resilient retraction toward the latter shaft.

10. A film hanger comprising a frame, spaced pairs of clamps therein arranged and adapted to receive and clamp the respective corners of a film, one pair of clamps being in fixed relation to the frame and the other pair being bodily movable, within limits, longitudinally of the frame, each of said latter pair having complementary clamping members, whereof one member comprises a basal plate having at one end an inwardly projecting clamping portion and at its opposite end a forwardly projecting cam-engaging portion, and also having a lateral flange spaced from the said clamping portion, and whereof the other member comprises a movable jaw, an operating shaft pivotally mounted in the lateral flanges of the basal plate and carrying the respective movable jaws, resilient means whereby the movable pair of clamps are normally positioned to tension the film gripped thereby, a rock-shaft mounted on said frame in spaced relation to the operating shaft for the movable pair of clamps, and cams on said rock-shaft co-operating with the cam-engaging portions of

the basal clamp plates to move the latter away from or permit their resilient retraction toward the rockshaft.

11. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, each of said clamps having complementary clamping members, whereof one member comprises a basal plate mounted on the frame and having a laterally resilient flange, and whereof the other member comprises a swinging arm pivotally mounted on said flange and frictionally movable thereagainst into and out of clamping relation to the basal plate, and a rock-shaft connecting the swinging clamping arms.

12. A film hanger comprising a frame, a plurality of spaced-apart clamps arranged and adapted to receive and clamp an edge of a film to be treated, each of said clamps having complementary clamping members, whereof one member comprises a basal plate mounted on the frame and having a laterally resilient flange provided with a locking projection, and whereof the other member comprises a swinging arm pivotally mounted on said flanges and movable against the said projection into and out of clamping relation to the basal plate, and a rock-shaft connecting the swinging clamping arms.

13. In a film hanger, a film clamp comprising a basal plate having a jaw portion at one end and a lateral flange spaced from and affording a stop for the edge of a film seated on said jaw portion, and a clamping jaw pivotally supported in said flange in cooperative relation to the said jaw portion.

14. In a film hanger frame, a film clamp including a basal plate movably mounted on the frame and movable within limits longitudinally of the frame and having at one end a jaw extending longitudinally of the frame and having at its opposite end a forwardly projecting cam-engaging portion and a movable cam for engaging said portion.

Signed at New York, in the county and State of New York, this 11th day of January, A. D. 1930.

HERMAN GOLLOMB.