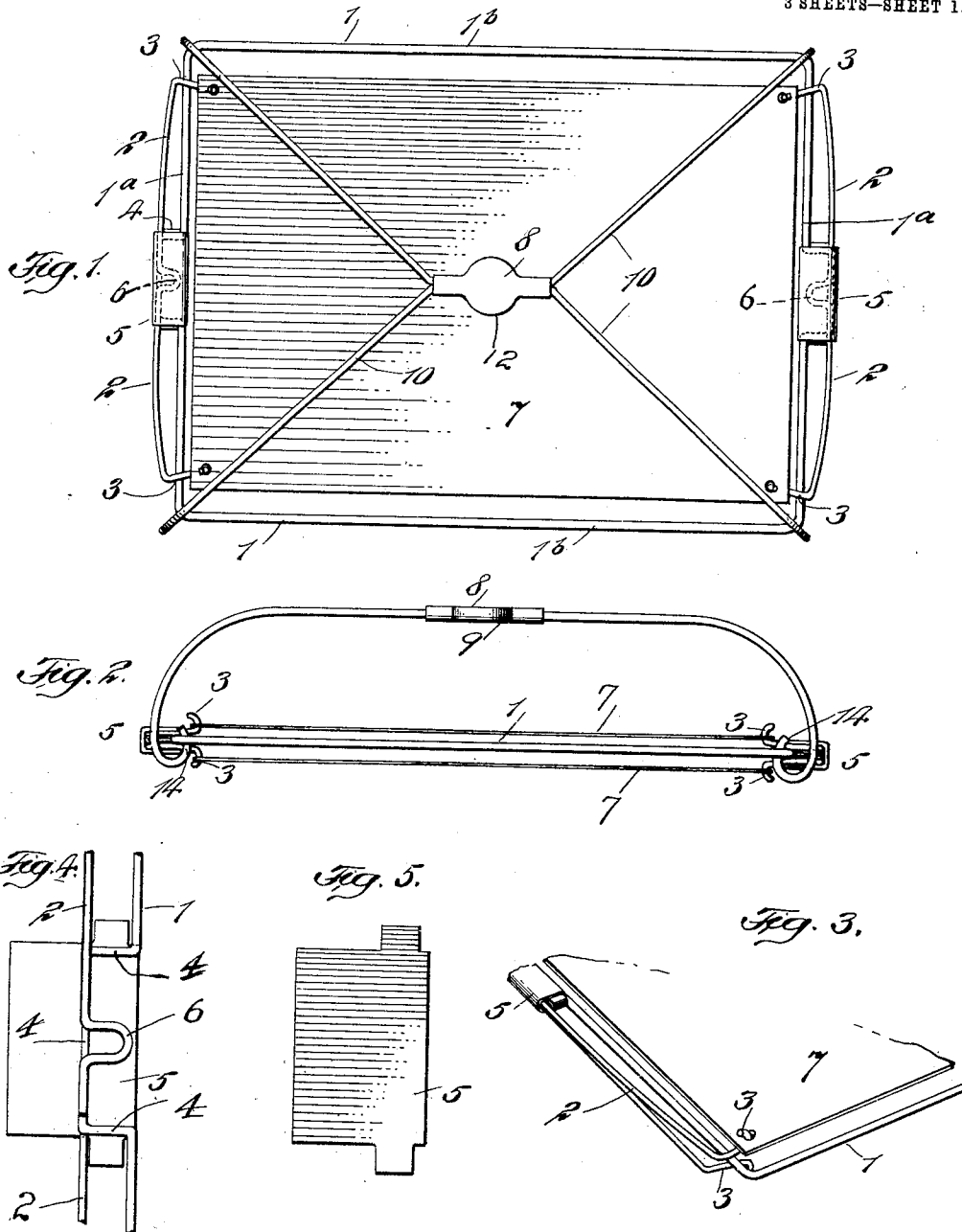




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 FILM SPREADER AND HOLDER.
 APPLICATION FILED JUNE 21, 1909.

961,808.

Patented June 21, 1910.

3 SHEETS—SHEET 2.

Fig. 6.

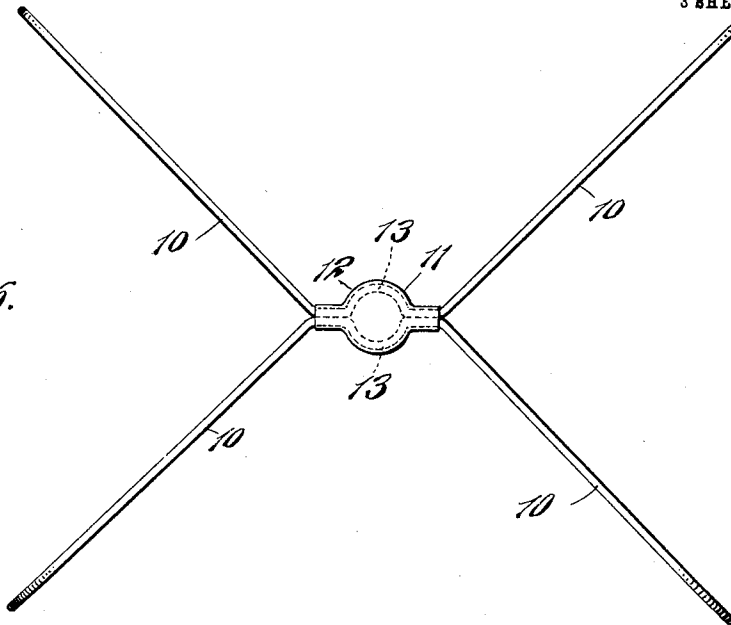


Fig. 7.

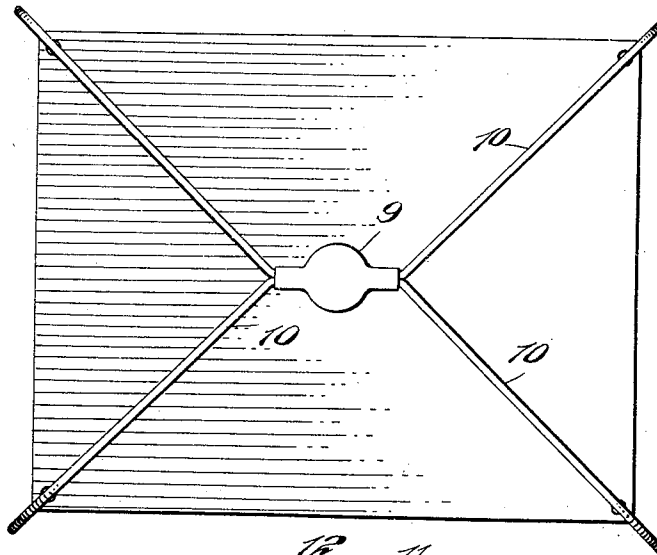
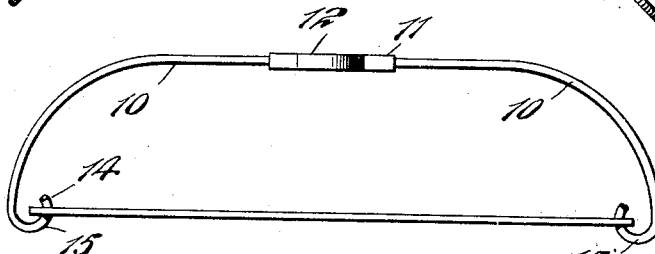


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

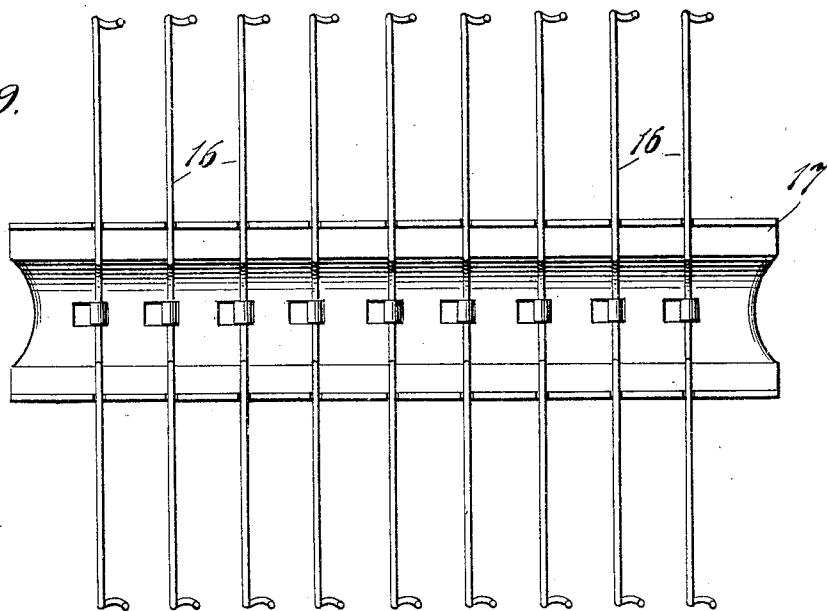
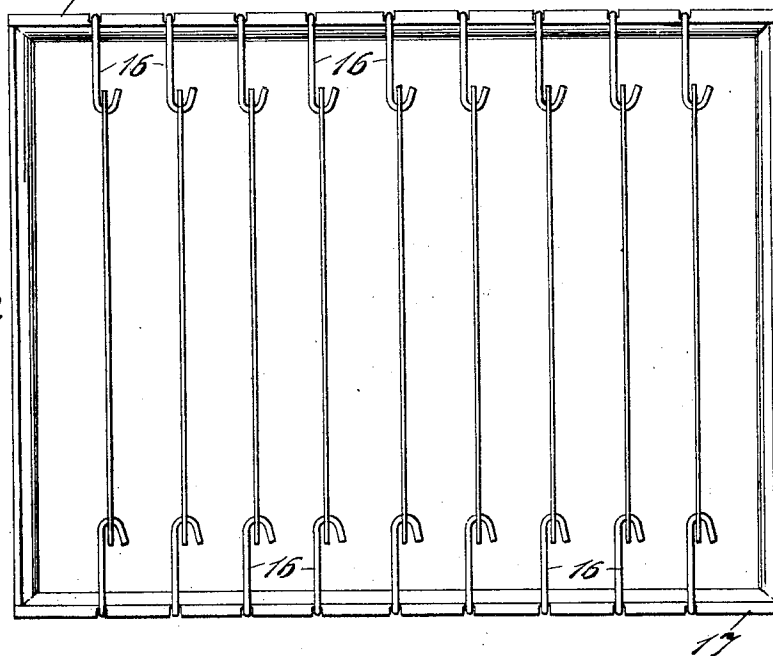


Fig. 10.



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UNITED STATES PATENT OFFICE.

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FILM SPREADER AND HOLDER.

961,808.

Specification of Letters Patent. Patented June 21, 1910.

Application filed June 21, 1909. Serial No. 503,313.

To all whom it may concern:

Be it known that I, OLIVER SHERWOOD, a citizen of the United States, and resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Film Spreaders and Holders, of which the following is a specification, reference being had therein to the accompanying drawing, in which—

Figure 1 is a plan view of the device; Fig. 2 a side elevation thereof; Fig. 3 a detail perspective view of one corner of the device; Fig. 4 a detail view of the means for securing the film holding spring arms to the main frame; Fig. 5 a detail view of the blank of the arm-clamping plate; Fig. 6 a plan view of the holding device; Fig. 7 a similar view showing a film connected directly to the holding device; Fig. 8 a side elevation of the part shown in Fig. 7; Fig. 9 a top plan view of a holding frame having a plurality of film holding spring arms; and Fig. 10 a side elevation of the device shown in Fig. 9.

This invention has for one of its objects to provide a simple, cheap and effective means whereby individual photo negative films may be held in yieldingly extended condition during the developing, fixing and washing operations and while being dried.

Another object of the invention is to provide a holding frame adapted to carry a plurality of films and so constructed that it may be placed in the usual fixing and washing boxes and held in an upright position in a manner similar to glass plates, the holding frame with its attached films being readily removable from the washing and fixing boxes and being of such form that the films may be held therein while they are being dried.

Another object of the invention is to provide a holding device by means of which the frame carrying the films, or if desired the films themselves, may be engaged and manipulated during the washing and fixing operations without the necessity of the operator placing his hands or his fingers in the developing or fixing solutions.

The advantages of my invention will be apparent to those experienced in developing photo negative films when it is understood that when the films have been attached or placed in their holders they need not be again detached until they are removed from

the holders after they have been developed, fixed, washed and dried.

Referring to the various parts by numerals, 1 designates the holding frame which is substantially rectangular in form and of such dimensions that it may be readily placed in an upright position in a developing, fixing or washing box. This frame is sufficiently rigid to maintain its shape and form during the manipulation of the films. Secured to opposite ends of this frame are spring arms 2. These arms are secured to the side bars in the frame about midway the ends thereof and extend in opposite directions, their ends terminating near the corners of the main frame. At the outer end of each arm is formed an inwardly extending negative holding hook 3 which extends within the main frame as shown clearly in Fig. 1. The side bars 1^a of the main frame are provided with outwardly extending off-sets 4 and to these off-sets the spring arms 2 are connected by folded sheet metal clamping plates 5. To prevent the film holding arms from rotating in the clamp they are provided with the lateral off-sets 6 which are clamped between the folds of the clamping plate 5. The main frame 1 is somewhat larger than the negative film 7, so that said film when connected to the hooks lies within the main frame, as indicated in Fig. 1.

I preferably secure to each side bar of the main frame two pairs of hooks, as shown clearly in Figs. 2 and 3, in order that two films may be carried by each main frame. As shown in Figs. 2 and 3, one set of hooks lies on each side of the main frame, so that the films will be held in parallel relation and separated a suitable distance from each other.

The spring arms 2 are of sufficient strength to maintain the films yieldingly extended during all of the operations of developing and fixing them and while they are drying, so that the dry films will be flat.

In order to hold the film during the developing operation I provide a detachable holder 8 which consists of the central body portion 9 and the resilient downwardly curved arms 10 which radiate from the body portion of the device and are adapted to extend to each corner of the carrying frame, or to each corner of a film when it is desired to connect a film directly to a holder. The body portion 1 may be formed in any suitable manner. As shown in the drawings

the frame and film holding arms are formed of two pieces of spring wire having their ends bent outwardly and downwardly to form the arms and having a central substantially horizontal portion 11 connecting the arms. The portions 11 are formed side by side and are inclosed by a folded metal casing 12, said casing securely binding the horizontal portions 11 together, each of said horizontal portions being bent laterally, as indicated at 13 in Fig. 6, to prevent the rotation of the horizontal portions within the inclosing frame.

Each arm 10 at its end is bent downwardly and then inwardly and upwardly to form a retaining hook 14, as clearly shown in Figs. 2 and 8. These hooks are adapted to engage in the corners of the holding frame or to extend through apertures in the corners of the film, as shown clearly in Figs. 1 and 2 and in Fig. 8. By turning the hooks inwardly as described, the film carrying frame and the film will be within the holder, the arms extending beyond the corners of the frame or the film and protecting the film; and by turning the hooks inwardly and upwardly the lower portions of the hooks form feet on which the holder may rest and the films supported above the bottom of the tray or above any support on which the holder may be placed. It will thus be seen that the holder forms a convenient means by which the films may be manipulated and for supporting the films during the developing operations and during the fixing and drying operations. The central body part 9 of the holder is sufficiently raised above the film to permit the film to be immersed in the developing or washing fluids without the necessity of the operator soiling his hands.

In Figs. 9 and 10 I have shown a frame having a plurality of resilient film carrying arms 16 which are secured to a rectangular supporting frame 17. These arms are secured to the frame midway their ends and are provided with film engaging hooks at their outer ends. This frame may be placed in a developing or washing box and may be used to hold the films while they are drying.

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

1. A film-holder comprising a main frame, a plurality of spring arms connected to opposite sides of said frame, said arms being parallel and formed with inwardly extending film-engaging hooks on the ends thereof.

2. A film-holder comprising a main frame, a series of parallel spring arms connected to opposite sides of said frame, said arms being adapted to be sprung inwardly toward the arms on the opposite side of the frame, and each of said arms being provided with film-engaging means at its free end, where-

by a plurality of films may be supported in parallel relation to each other, the spring arms holding said films flat and yielding to the expansion and contraction of said films.

3. A film holder comprising a main rectangular frame, spring arms connected to opposite sides of said frame, film engaging hooks formed on the ends of said arms, one of said hooks being adjacent to each corner of the main frame, said hooks extending within the plane of said frame, whereby the film will be maintained in a yieldingly extended position within said frame, in combination with a holding device formed with four radiating downwardly curved resilient arms, each of said arms being formed with a hook at its end adapted to engage the holding frame at its corners.

4. A film holder comprising a main rectangular frame, spring arms connected to opposite sides of said frame, film engaging hooks formed on the ends of said arms, one of said hooks being adjacent to each corner of the main frame, said hooks extending within the plane of said frame, whereby the film will be maintained in a yieldingly extended position within said frame, in combination with a holding device formed with four radiating downwardly curved, resilient arms, each of said arms being formed with an upwardly and inwardly turned hook adapted to engage the main frame at the corners thereof, whereby a portion of the hook will extend below the main frame and serve as a rest.

5. A film holder comprising a main rectangular open frame, parallel resilient arms connected to opposite sides of said frame and extending outwardly to the corners thereof, an inwardly extending hook formed on the outer end of each arm, said hook extending into the plane of the main frame and adapted to hold a film within the main frame, and a detachable holding device formed with radiating resilient arms adapted to detachably engage the main frame at the corners thereof.

6. A film-holder comprising a main frame, a series of parallel spring arms connected to opposite sides of said frame, means to hold said arms against rotation, film-engaging means at the free end of each of said arms, whereby a plurality of films may be held flat and in parallel relation.

7. A film-holder comprising a main rectangular frame, spring arms connected to opposite sides of said frame and substantially parallel with the adjacent side of said frame, means to prevent the rotation of said arms, film-engaging means at the free end of each of said arms, said arms being adapted to be sprung inwardly to engage and yieldingly suspend the film.

8. A film-holder comprising a main rectangular frame, a plurality of spring arms

connected to opposite sides of said frame, the arms on each side of the frame being parallel, means to prevent the rotation of said arms, film-engaging means carried by each of said arms, said means being adjacent to each corner of the main frame.

9. A film-holder comprising a main rectangular frame, spring arms connected to opposite sides of said frame, film-engaging devices at the free end of each arm, one of said devices being adjacent to each corner of the main frame in combination with a holding device formed with four radiating downwardly curved resilient arms, each of said arms being provided with means at its end to engage and support the holding frame.

10. A holder comprising four radiating resilient arms rigidly connected together at the center of the device and provided at their ends with holding hooks, each of said hooks being formed by curving the arm downwardly and then upwardly and inwardly to form an upwardly extending hook within the curved portion of the arm, the said curved portion of the arm forming a protecting means for the corner of the device held by the hook, said arms being adapted to be sprung inwardly toward the center of the device to adapt them to be engaged with the part to be held by them, and that portion of the hook below the part held by the hooks form-

ing a rest by means of which the held part will be sustained above the bottoms of said rests.

11. A holder comprising four radiating resilient downwardly curved arms, means for rigidly clamping said arms together at the center of the device to hold said arms in fixed rigid relation to each other and to form a handle, each of said arms being provided at its end with a holding hook, each of said hooks being formed by curving the arm downwardly and then upwardly and inwardly to form an upwardly extending hook within the curved portion of the arm, the said curved portion of the arm forming a protecting means for the corner of the device held by the hook, said arms being adapted to be sprung inwardly toward the center of the device to adapt them to be engaged with the part to be held by them, and that portion of the hook below the part held by the hooks forming a rest by means of which the held part will be sustained above the bottoms of said rests.

In testimony whereof I hereunto affix my signature in the presence of two witnesses this 16th day of June 1909.

OLIVER SHERWOOD.

Witnesses:

E. H. KAUFMANN,
F. R. MILLER.