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1,454,213

A. K. CHAPMAN ET AL

FILM CLIP

Filed Jan. 13, 1921

FIG. 1.

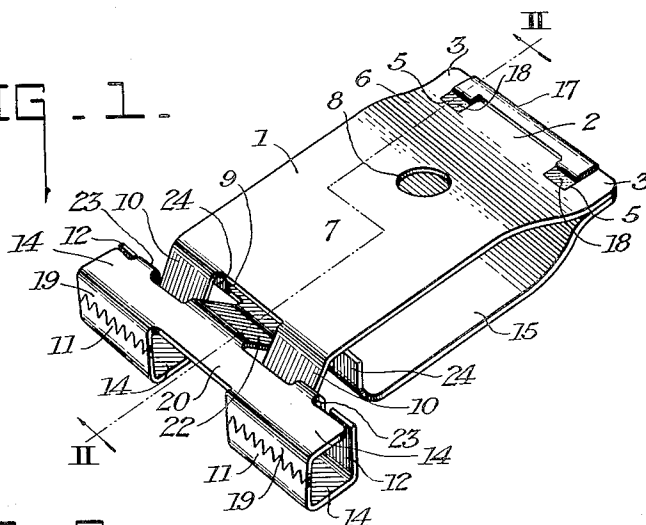


FIG. 2.

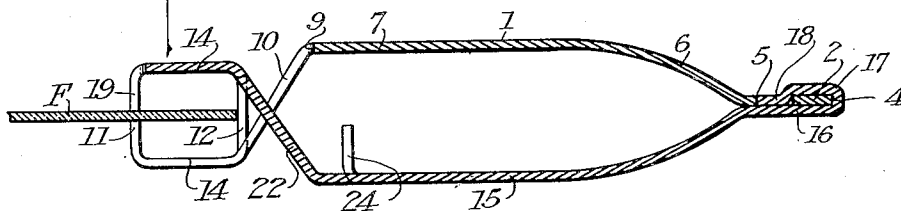


FIG. 3.

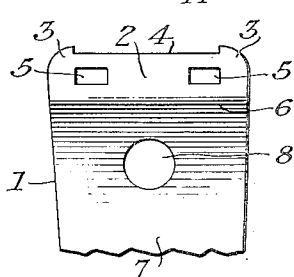
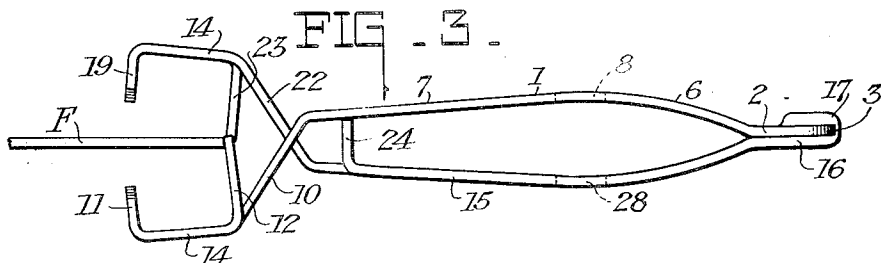


FIG. 4.

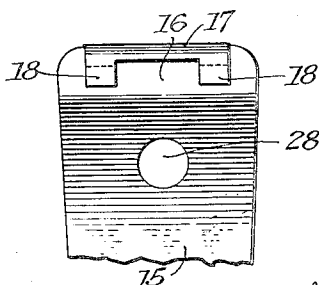


FIG. 5.

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UNITED STATES PATENT OFFICE.

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FILM CLIP.

Application filed January 13, 1921. Serial No. 437,067.

To all whom it may concern:

Be it known that we, ALBERT K. CHAPMAN and GARSHOM A. RIGGS, citizens of the United States of America, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Film Clips, of which the following is a full, clear, and exact specification.

10 This device relates to photography, and more particularly to photographic film clips used for holding a film during the developing, fixing, washing and drying operations. One object of our invention is to provide a
 15 substantial clip which will withstand hard usage; another object is to provide a clip having parts which can be readily made and assembled; another object is to provide a clip having jaws which will firmly hold a
 20 film strip and yet at the same time will have a minimum contact therewith; still another object is to provide a clip in which the film can be thrust a limited distance; another object is to limit the movement of the film
 25 jaws of the clip; and still another object is to provide a clip having jaws through which air may freely circulate so that the film will not stick to the jaws and water pockets will be prevented when drying. Other objects
 30 will appear hereinafter, the novel features being pointed out in the claims at the end of the specification.

At the present time the amateur finishing business requires equipment which can be
 35 steadily and rapidly operated, particularly where "twenty-four hour service" is rendered. All unnecessary steps must be eliminated. Where films are developed in quantity it is common practice to load a number
 40 upon a rack, fastening the film with suitable clips and treat them with the various solutions. To dry, the film strips are suspended by clips in a suitable drying cabinet. It is desirable to use the same clips for holding
 45 the films through all the operations, but with most clips now on the market the water will remain between the jaws and film causing uneven drying, if indeed the film held by the clip will dry at all. This in roll film, means cutting
 50 off the wet end which not only takes additional time, but is liable to cause the destruction of the film identifying number, usually written with soft pencil upon the end of the film strip. Moreover, where the

films are piled up, wet spots on one film will 55
 spoil the dry picture area of another, thus causing a variety of difficulties. In cut film, a part of the picture area is frequently marred, as well as the usual trouble caused by wet spots and uneven drying. 60

The elimination of the troublesome water pockets which result in so much damage is, therefore, very important. By experimenting we have found that the chief sources of these water pockets are two or more sur- 65
 faces, such as two of metal or metal and film, either touching each other in places or lying close to each other. Where this condition exists the water is held by capillary attraction between the surfaces. In some clips 70
 water pockets are formed by the film thrust into the jaw too far, where it may buckle or curve so as to lie against a metal surface. Other clips have grooves or flanges for receiving the film, but these generally press 75
 the film against, or close to one side of the film groove, thus forming a space in which water collects. By spacing the metal surfaces of the clip at considerable distance 80
 from both sides of the film, this difficulty can be overcome; although the teeth which engage the film must be designed so as to firmly grip in the film coating, leaving as small openings between the teeth as possible 85
 to get the best results. Where the teeth are large the resulting slot between them extending some distance up from the film forms the undesirable water pockets. Consequently we have provided "saw toothed" film-engaging jaws, the teeth being comparatively 90
 small, and spaced in two sets with a broad opening between the sets. The teeth being small are practically filled up with the gelatine on the film base. By making the opening between the sets less than 1-5/8", the 95
 width of a "vest pocket" film, the clip illustrated will successfully handle film from this small size up to "3A" or 4" x 5" film. Any of these sizes will be held with a very small portion of the film area engaged by the 100
 teeth, and, while the film end may and generally does, contact with the limiting stops opposite the jaws, nevertheless free air circulation is permitted through the center of the jaws both front and back, and through 105
 the ends, so that all of the gelatine coated film base, except the small area under the teeth, is exposed to the air. It is practically

impossible to bring a film surface within three-sixteenths of an inch of a metal surface in our improved clip, this distance being sufficient generally to avoid capillary attraction.

A substantial springy base is provided in our clip by having the spring arms bend sharply from a flat contacting seat, the two arms being united and reinforced along one edge of this flat surface, thus eliminating any tendency for the spring to become set or to materially lose its strength. Coming now to the drawings in which like reference characters denote like parts:

Fig. 1 is a perspective view of a clip constructed in accordance with, and embodying one form of, our invention;

Fig. 2 is a section on line II—II of Fig. 1;

Fig. 3 is a side elevation of our clip open;

Fig. 4 is a fragmentary elevation of the rear end of a portion of one jaw; and

Fig. 5 is a view similar to Fig. 4 of the other jaw.

The upper jaw 1 comprises a metal plate having a rear flat portion or seat 2, which is cut so as to have guiding lugs 3. Inside of the reduced portion 4, (Fig. 4) between these lugs, are apertures 5—5 cut through the metal. Just beyond these apertures the plate curves away at 6, forming a spring arm, continuing into a flat portion 7 which serves as an operating grip. An aperture 8 provides a means for hanging the clip upon a rod or nail. The central portion 9 is cut away, leaving the angularly disposed metal tongues 10—10 from which the jaws are made, after bending the metal substantially parallel to portion 7, and then at right angles thereto. Saw teeth 11—11 are for gripping the film. The metal plates supporting the teeth are spaced some distance from a film F as is shown at 14, (Fig. 2) permitting free circulation of air and also preventing the film side from contacting with, or coming close to any metal. Stops 12—12 extend up from plate 14—14 substantially parallel to the plates carrying the teeth 11—11.

The lower jaw 15 is similar in general contour to plate 1, the arrangement of the jaws and clamping back end differing. As shown in Fig. 5 plate 15 is provided with a flat contacting seat 16, the end of which 17, is bent upon itself, forming a reinforcing flange having extending lugs 18—18. This construction provides a simple, yet strong and efficient spring base. Section 15 is slid over the end of section 1, with part 17 fitting snugly between the guiding lugs 3, and the lugs 18—18 are then forced down, being bent on dashed lines Fig. 5, into apertures 5—5, firmly uniting the two parts. The teeth 19—19 are similar to those of the upper plate, but differ in that their supporting plate 20, is joined to the plate 15 by a single

angularly disposed tongue 22. Also the limiting stops 23—23 are inside of the stops of the top plate. When we refer to top and bottom of the clip we refer merely to the position of the parts as shown in the drawing. There is also an aperture 28 (see Fig. 3) in alignment with aperture 8 of arm 1.

In order to limit the opening of the jaws there are stops 24—24 formed by bending up plate 15 on each side of tongue 22. These stops contact with the under side of plate 1 as best shown in Fig. 3. In this figure the clip is opened as far as possible, and as here shown, a film F is thrust a maximum distance between the jaws. The limiting stops 12—12 and 23—23 prevent the film from being thrust into the angular space formed by the jaws, thus forming a space for water to collect. Stops 24—24 prevent the clip from being opened sufficiently far to render stops 12—12 and 23—23 inoperative.

From the above description it will readily be seen that with the film clip shown and described, that the sensitive gelatinous coatings on the film surfaces are abraded only directly under the teeth of the clip. At no other place do the sides of the film contact with metal, so that with the generous air space provided for the film inside of the jaws, it will dry as quickly and evenly as the film outside of the clip. Moreover the teeth hold firmly upon the film, and will grip at a limited distance from the end or edge of the film. Being relatively small they do not distort the base by punching large holes therein. The spring metal plates are securely interlocked at the base, the flanges on one part forming a reinforcing strip across the spring joint. There are no metal parts lying close to or touching the film so that slow drying drops of water will not form thus eliminating the streaks and spots frequently due to uneven drying.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. In a film clip comprising spring arms, plates formed on the ends of the arms, film engaging teeth extending from the plates, limiting stops spaced from the teeth also extending from the plates, said plates being spaced from a film held by the teeth.

2. A film clip comprising film engaging teeth, spring arms for normally holding the film engaging teeth together, stops for limiting the distance a film can be thrust between the teeth, and means carried by one spring arm for limiting the movement of the stops which limit the film movement between the teeth.

3. A film clip comprising two spring arms, each having an angularly disposed tongue bent from an end of the arm, a supporting plate, a jaw carried by the supporting plate, and means carried by the supporting plate

for limiting the inward movement of a film inserted into the jaws, whereby the film edge will be held from between the angularly disposed tongues.

- ⁵ 4. A film clip comprising two plates, one having guiding lugs on one end with apertures in the metal inside of the end, and the other plate having an interlocking flange

folded upon itself between the guiding lugs and into the apertures, the joint thus made forming a reinforcing strip across the base of the plate. 10

Signed at Rochester, New York, this 8th day of January 1921.

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