June 7, 1938. I. MARKS 2,119,943

FILM REEL

Filed Jan. 8, 1937

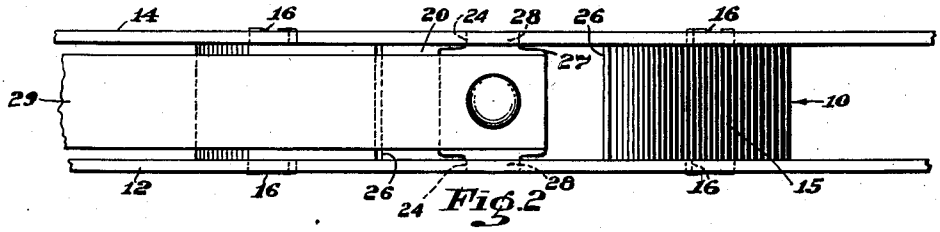


Fig. 2

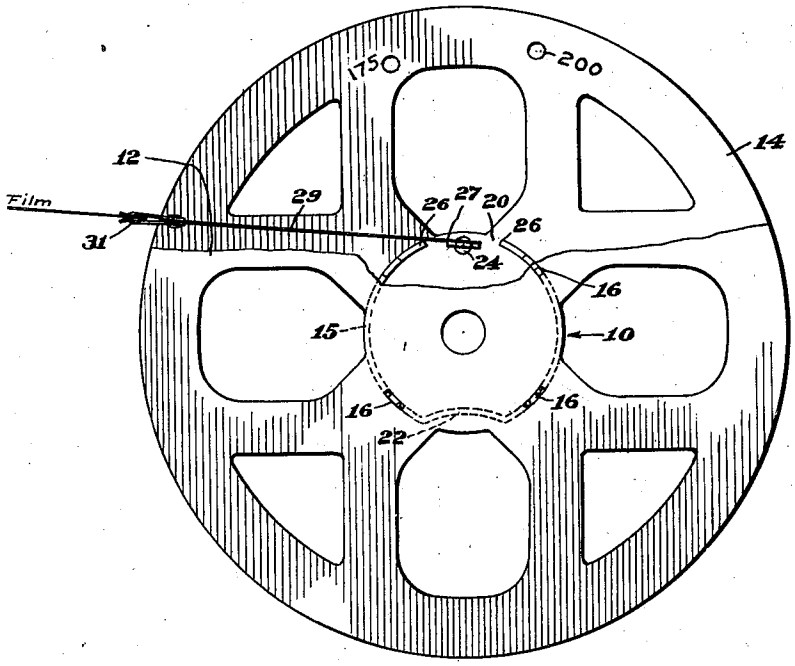


Fig. 1

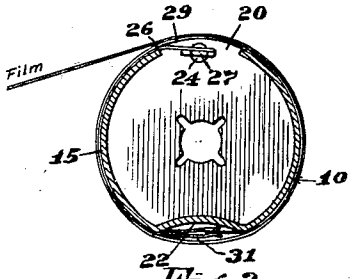


Fig. 3

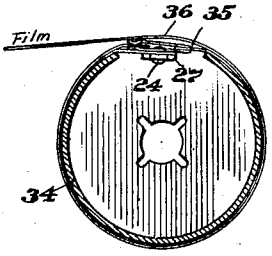


Fig. 4

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FILM REEL

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5 Claims. (Cl. 242—74)

This invention relates to winding reels and more particularly to film reels employed in motion picture projection. The general object of the invention is to improve the construction of film reels of the kind wherein the film may be connected for reeling without the necessity of reaching inside the side flanges to the hub on which the film is to be wound.

To the accomplishment of this object and such others as may hereinafter appear, as will readily be understood by those skilled in the art, the invention comprises the features and combinations of parts hereinafter described and then particularly pointed out in the appended claims.

The nature and scope of the invention will best be understood from a description of the preferred embodiment thereof illustrated in the accompanying drawing, in which:

Figure 1 is a side view of the reel with the near side flange partly broken away to expose the extension piece to which the film is attached before reeling;

Fig. 2 is an enlarged view, in plan, of the hub portion of the reel as shown in Fig. 1;

Fig. 3 is a view of the hub portion alone, in cross-section, showing the beginning of the reeling of a film on the hub of a small sized reel; and

Fig. 4 is a view similar to Fig. 3 showing the beginning of the reeling of a film on the hub of a reel carrying greater lengths of film.

The side flanges of film reels vary in diameter according to the length of film to be reeled. In practice the smaller size of reel, with a flange diameter of 5 inches and a hub diameter of 1½ inches, holds up to 200 feet of film. While the larger size of reel for greater lengths of film must have a much larger flange diameter the present invention enables the manufacturer to use the same size of hub for both large and small reels thus securing a saving in the costs of manufacture.

In the embodiment of the invention illustrated in the drawing, 10 indicates the hub generally and 12 and 14 the two usual flanges one at each side face of the hub and spaced thereby. The hub is of simple construction and consists of a flat strip 15, for example aluminum as generally used for the manufacture of film reels, bent to a circular form and having four tongues 16 at each edge. Each flange is provided with four slots in circular series for receiving the tongues at one side of the hub and the three parts are united by inserting the hub tongues in said slots and then peaning them down against the outer faces of the flanges. The body of the reel thus consists of but three parts formed simply and inexpensively from sheet metal. Each flange has the usual opening at its center for seating on the reel spindle of the projector or winder.

The curved strip 15 forming the hub does not form a complete circle, the strip being of such length that an opening or gap 20 is left communicating with the hollow interior. Preferably, but not essential in the reels for the longer films, the hub strip is provided with a depression 22 opposite the gap 20 for a purpose presently to be explained. Each flange is punched with a circular hole 24 about centrally between the spaced ends 26 of the hub strip which bound the gap 20. These holes are axially aligned and their axis lies just inside of the circle formed by the hub. A small plate 27, having a width which may be slightly less than that of the hub strip to permit free play, has a pair of side tongues 28 adapted to have a bearing fit one in each hole 24 thus forming flat trunnions for free rotary movement of the plate relative to the hub. Before assembling the pivot plate with the flanges the inner end of an extension strip 29, having a film clip 31 at its outer end, is secured to one face of the plate as by riveting. To all intents and purposes the strip and plate constitute one integral piece.

The extension strip 29 is preferably formed of a thin metallic ribbon having sufficient resiliency to wind against the hub beneath the convolutions of the film and sufficient resiliency to resume a substantially straight form when the reel is empty. The said strip is of less width than the spacing of the two flanges for free movement between them. It also is of such a length that it will project its film clip 31 outside the perimeter of the reel flanges when disposed radially of the reel; in the small reel illustrated this is true for any angular position it can take within the gap bounded by the two spaced ends 26 of the hub.

If the hub had a continuous cylindrical surface the clip 31 would form a bunch or high place thereon as the film is wound over it, preventing circular convolutions being formed and thus causing uneven unreeling. The novel construction of the hub serves to overcome this difficulty both for the small reel having a maximum capacity of 200 feet of film (as indicated in Fig. 1) and for the larger reels having capacity for greater lengths of film.

Referring to Figs. 1 and 3 of the drawing it will be seen that the relation of the hub diameter to the length of the extension strip is such that on starting to reel a film the extension strip 29

will enwrap one half of the hub circumference. This brings the film clip 31 to a point opposite the hub gap 20. The purpose of the depression 22 which forms an elongated cavity at this point in the hub strip 15 is to receive the clip and thus avoid the otherwise objectionable bunch beneath the film. The clip springs may be bowed, as shown, so that when the clip is seated in the depression it will serve to build up the hub surface at this point to substantially circular form for supporting the film convolutions.

In the larger size of reel the flange diameter is such that, using the same size of hub as for the smaller reel, the extension strip is substantially double the length required for the smaller reel. Thus in the larger reels the extension strip 33 thereof will completely encircle the hub 34 (see Fig. 4) and in such case the depression 22 is not needed, the gap 35 in the hub serving as a depression in which the film clip 36 may be received to prevent a bunch in the wound film.

It will be seen from Fig. 1 that when the substantially straight extension strip is at the extreme limit of its angular movement within the hub gap 20, that is against one of the hub ends 26, it lies in a plane approaching a tangent to the circumferential surface of the hub. Thus, in starting the reeling of a film, the extension strip need be bent but slightly to contact the surface of the hub. This is highly advantageous because continually subjecting the extension strip to a sharp bend, such as through a right angle, will eventually misshape the metal of the strip to such an extent that on removal of a film the strip will be unable to straighten and throw the clip out beyond the perimeter of the flanges for rethreading a film.

It is within the scope of the invention to seat the inner end of the extension strip in the bearing holes between the side flanges in any suitable manner that permits free pivotal movement within the hub gap; and those skilled in the art will recognize that the novel hub and extension strip of this invention may be used on film reels for either an 8 mm. or a 16 mm. film. Obviously changes may be made within the skill of the artisan without departing from the true invention as defined by the appended claims.

What is claimed as new, is:—

1. A film reel comprising a pair of side flanges a hollow circular hub, said hub being formed of a piece of strip material having a length less than the circumferential dimension of the hub to be formed therefrom, the spaced end edges thereof presenting a gap of substantial width in the wall of the hub communicating with its hollow interior, and a flexible extension strip leading outward through said gap for starting the reeling of a film, said strip having its inner end pivotally mounted between said flanges, the axis of the pivot lying within the circumference of the circle defined by said hub.

2. A film reel according to claim 1 in which the portion of the wall of the hub opposite said gap is depressed forming an elongated cavity in said wall.

3. A film reel according to claim 1 in which the inner end of said extension strip is connected to said side flanges at substantially the center of said gap in the wall of the hub.

4. A film reel according to claim 1 in which the inner end of said extension strip carries side trunnions pivoting in said side flanges, the axis of said trunnions lying between and parallel to said spaced end edges of the hub.

5. A film reel according to claim 1 in which each side flange is provided with a circular hole intermediate the end edges of the strip forming the hub, and the inner end of said extension strip is provided with side trunnions entered in said holes permitting the extension strip while substantially straight to be swung bodily within said gap to lie against an end edge of the hub strip, the axis of said holes being within the hollow of the hub but so close to the circumferential surface of said hub that when said straight extension strip is in engagement with an end edge of the hub it lies in a plane approaching a tangent to said circumferential surface, thereby avoiding a sharp bend over said end edge in winding the extension strip on the hub.

ISIDORE MARKS.