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APERTURE PLATE

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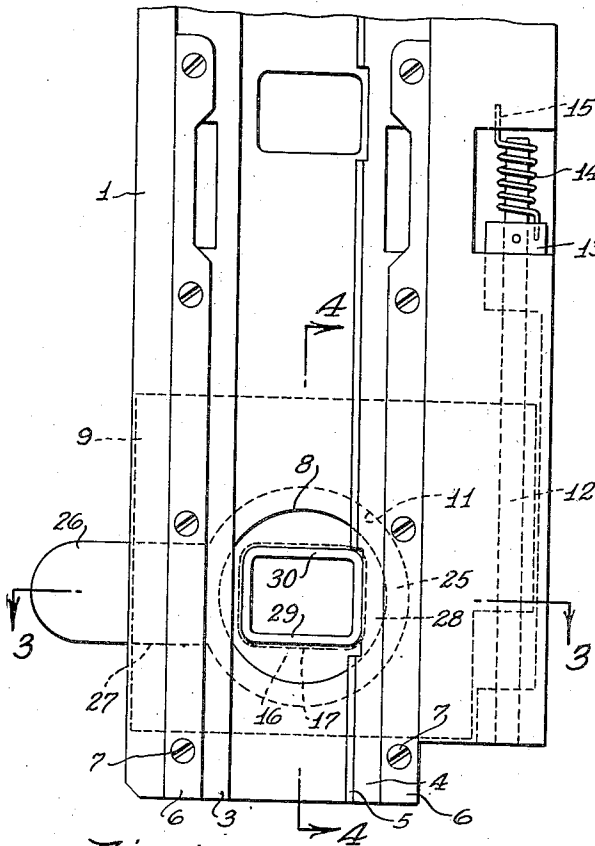


Fig. 1.

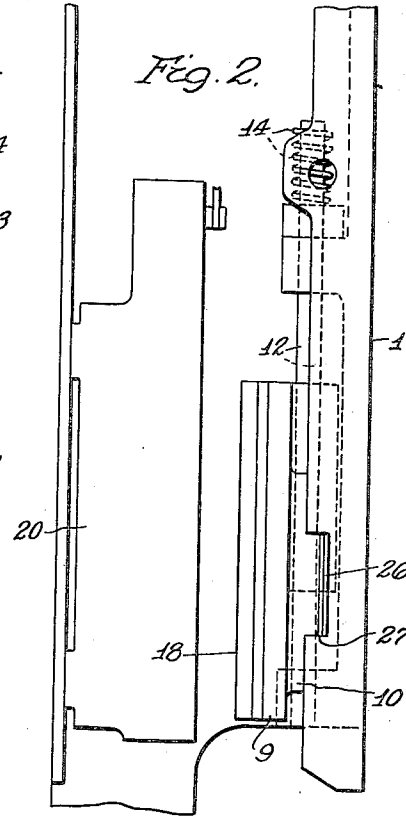


Fig. 2.

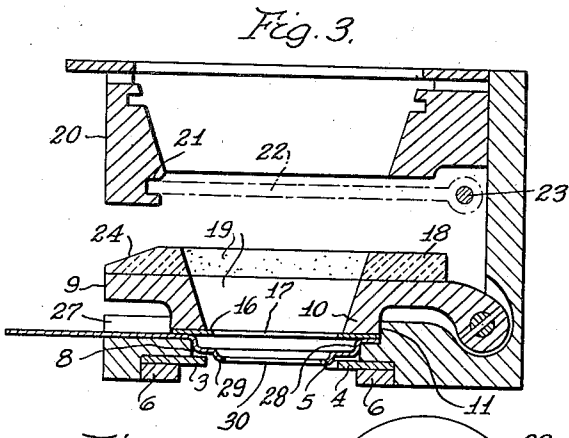


Fig. 3.

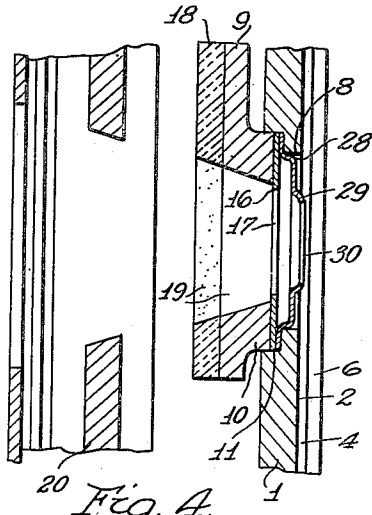


Fig. 4.

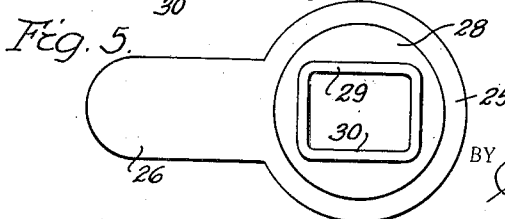


Fig. 5.

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## UNITED STATES PATENT OFFICE

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## APERTURE PLATE

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6 Claims. (Cl. 88—17)

The present invention pertains to a novel aperture plate assembly for motion picture machines.

In the projection of motion pictures, it is desirable to have the final aperture member close to the film and yet not in contact therewith. This member collects dust and other matter, particularly around the edges of the aperture, and occasionally requires cleaning to maintain a clear and sharp edge on the projected picture.

The principal object of the present invention is to provide a construction wherein such cleaning is facilitated by easy removal and easy reinsertion of the final aperture member. Another object of the invention is to provide a construction whereby it is possible to remove the final aperture plate for cleaning while the machine is running, in which case the picture is projected on the screen through a sub-aperture plate. Although the picture thus projected has a somewhat blurred edge, it is not entirely unsatisfactory for the short time required in cleaning and reinserting the final aperture member.

In the accomplishment of these objects, the final aperture member is adapted to be seated between the usual film guiding means and a spring mounted retaining plate at the rear side thereof. It has been customary in the past to seat a removable aperture plate between and by the parallel film guide rails. In this invention the aperture plate is located on a circular seat and consequently is mounted with greater ease than in seating between a pair of parallel rails. The aperture plate has a finger piece that fits in a notch formed in an adjacent member, whereby the plate is held against displacement circularly in its seat.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing in which:

Figure 1 is a front elevation of the aperture plate assembly, viewed oppositely to the direction of projection;

Figure 2 is a side elevation thereof;

Figure 3 is a plan section on the line 3—3 of Figure 1;

Figure 4 is a vertical section on the line 4—4 of Figure 1, and

Figure 5 is an elevation of the final aperture plate.

Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

The film guiding plate 1 is a flat vertical member with a channel 2 cut in its forward face. To the bottom of the channel and along the

edges thereof are mounted film support rails 3 and 4, the latter having a bevelled inner edge 5 for a purpose which will presently appear. Upon these rails and against the sides of the channel are mounted film guide rails 6 secured through the rails 3, 4 to the plate 1 by screws 7. The rails 6 are spaced apart sufficiently to guide rather accurately a film riding on the exposed portions of the rails 3, 4 which in turn are spaced apart a distance somewhat wider than the picture on the film. In the vicinity of the projection aperture, the plate 1 is formed with a circular or other suitably shaped opening 8 through the bottom of the channel 2 and circumscribing the projection aperture, as will presently appear more clearly.

Behind the plate 1 is a retaining member 9 having on its forward face a boss 10 adapted to seat in a recess 11 formed in the plate 1 behind the opening 8 and somewhat larger than the latter. The member 9 is mounted on a vertical hinge rod 12 journaled in the plate. The rod carries a fixed collar 13 to which is secured one end of a coil spring 14 surrounding a portion of the rod and having its other end 15 fixed to the plate structure, whereby the member 9 is spring-pressed to its closed position shown in Figures 3 and 4. On the forward face of the member 9 is secured a sub-aperture plate 16 having a rectangular aperture 17 dimensioned to frame the projected picture properly on the screen, although such picture will have a somewhat ragged edge due to the spacing of the plate 16 from the film riding on the supports 3, 4. To the rear side of the member 9 is fastened a plate 18 of heat insulating material. This plate and the member 9 are apertured at 19 convergingly towards the aperture 17.

Behind the member 9 is mounted a fire shutter guide 20 having a groove 21 adapted to receive one edge of a sliding fire shutter 22, the other edge of which is slidably mounted on a fixed vertical rod 23. The rear free edge of the insulating plate 18 is bevelled at 24 to permit a wider swing on the hinge rod 12 before striking the member 20.

The final aperture plate is preferably a stamping having a body portion 25 of the same shape and dimensions as the sub-aperture plate 16 and therefore adapted to seat in the opening 11 as shown in Figures 3 and 4. From the body 25 extends a finger piece 26 which seats in a notch 27 formed in the rear side of the gate plate 1 at the outer edge thereof. The member 25 is depressed forwardly at 28 to seat in the opening 8.

This opening and the depression 28 are preferably circular to facilitate seating the depression in the opening, but other shapes may be employed if desired.

The depressed portion 28 is again depressed forwardly and rectangularly at 29 to a slight distance behind the plane of the supporting surfaces of the guide rails 3, 4, and in the portion 29 is formed the final rectangular projection aperture 30.

In the use of the device, assuming that the machine has been running and it is desired to remove the final aperture plate for cleaning, the finger piece 26 is pushed rearwardly to swing the retaining member 9 against the shutter guide 20, whereupon the member 25, 26 is readily withdrawn by a lateral pull. The machine may continue to run, as the sub-aperture plate 16 frames the picture fairly satisfactorily on the screen, as already pointed out. The cleaned plate, or a substitute, is inserted by a prying movement thereof at the notch 27 against the retaining plate 9. The depression 28 readily seats in the recess 11, especially if both are circular, and the angular position is set by fitting the finger piece 26 in the notch 27. Rapidity in this replacement operation is highly desirable in order to interfere with the projection for only a very short interval.

The bevelled edge 5 of the rail 4 aids the film in riding up on the rails during threading.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:

1. In a motion picture machine, a film-engaging plate having a circular opening therethrough, a retaining member movably mounted at the rear side of said plate, and an aperture plate insertable between said plate and member and having a circular portion adapted to seat in said opening, said retaining member being adapted to engage the inserted aperture plate, and means for retaining said aperture plate against rotation in said opening.

2. In a motion picture machine, a film-engaging plate having a circular opening therethrough, a retaining member movably mounted at the rear side of said plate, and an aperture plate insertable between said plate and member and having a circular portion adapted to seat in said opening, said retaining member being adapted to engage the inserted aperture plate, a finger piece

extending laterally from said aperture plate, said gate plate having a notch into which said piece fits.

3. In a motion picture machine, a film-engaging plate having an opening therethrough, a retaining member movably mounted at the rear side of said plate, and an aperture plate insertable between said plate and member and adapted to seat in said opening, said retaining member being adapted to engage the inserted aperture plate, said retaining member having an accurate projection aperture larger than the aperture of said aperture plate and dimensioned to produce a projected luminous area substantially the same size as that produced by the last mentioned aperture, on removal of said aperture plate.

4. In a motion picture machine, a film-engaging plate having an opening therethrough and a larger recess behind said opening, a retaining member yieldably and hingedly mounted at the rear side of said plate, an aperture plate insertable between said plate and member, said aperture plate being shaped to seat in said recess and depressed forwardly to fit in said opening, and a boss on said member adapted to enter said recess and engage the inserted aperture plate.

5. In a motion picture machine, a film-engaging plate having a circular opening therethrough and a larger concentric circular recess behind the opening, a retaining member movably mounted at the rear side of said plate, an aperture plate insertable between said plate and member, said aperture plate being shaped to seat in said recess and depressed forwardly to fit in said opening, a boss on said member adapted to enter said recess and engage the inserted aperture plate, and means for retaining said aperture plate against rotation in said recess.

6. In a motion picture machine, a film-engaging plate having an opening therethrough and a larger recess behind said opening, a retaining member movably mounted at the rear side of said plate, an aperture plate insertable between said plate and member, said aperture plate being shaped to seat in said recess and depressed forwardly to fit in said opening, the depressed portion being again depressed forwardly and the projection aperture being formed in the second depression, whereby to bring its projection aperture into close proximity to a film moving along said film-engaging plate, and a boss on said member adapted to enter said recess and engage the inserted aperture plate.

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