

Oct. 13, 1942.

C. D. REID

2,298,413

MEANS FOR POSITIONING LANTERN SLIDES

Filed April 24, 1941

FIG. 1.

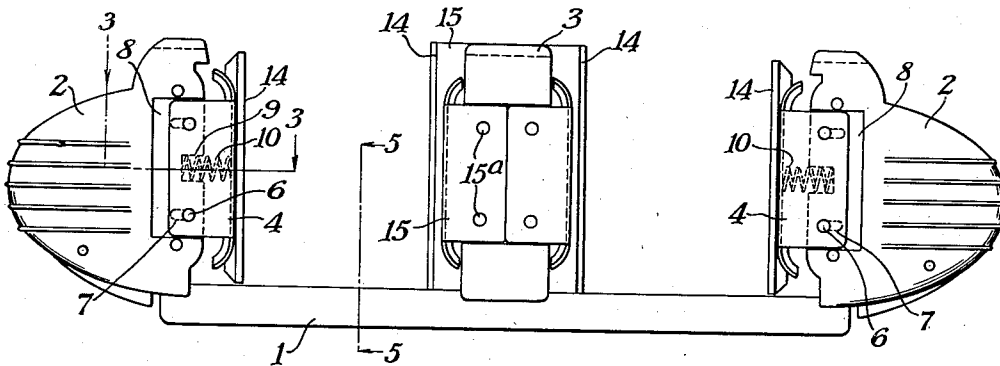


FIG. 2.

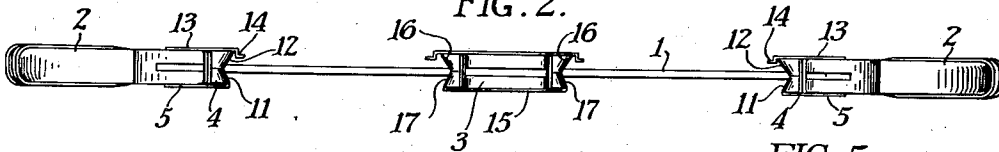


FIG. 3.

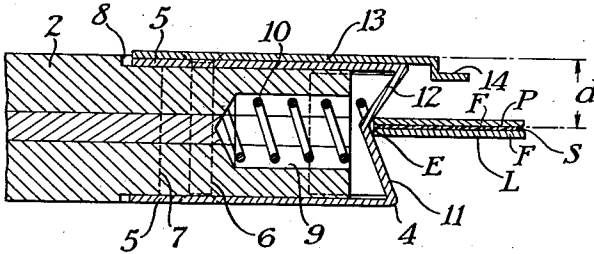


FIG. 4.

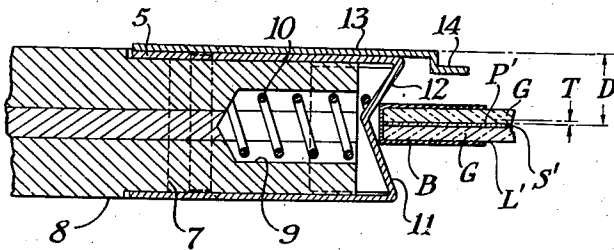
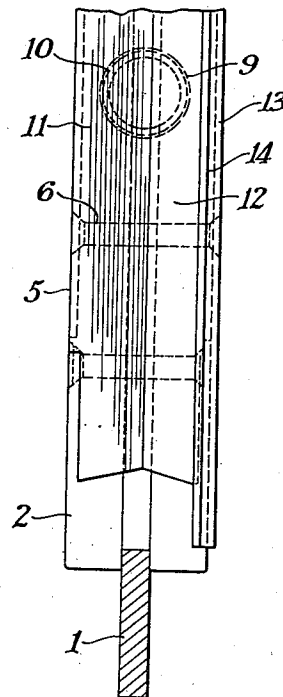


FIG. 5.



CHARLES D. REID
INVENTOR

BY *Newton M. Parnis*
Donald H. Stewart
ATTORNEYS

UNITED STATES PATENT OFFICE

2,298,413

MEANS FOR POSITIONING LANTERN SLIDES

Charles D. Reid, Rochester, N. Y., assignor to
Eastman Kodak Company, Rochester, N. Y., a
corporation of New Jersey

Application April 24, 1941, Serial No. 390,139

3 Claims. (Cl. 88—26)

This invention relates to projection and more particularly to slide carriers for positioning picture carrying elements in a projector.

One object of my invention is to provide a picture carrier in which lantern slides of different thicknesses may be used. Another object of my invention is to provide a carrier of the class described which may accurately position lantern slides of two different thicknesses and which will position other lantern slides close to the proper position so that the minimum amount of focusing will be necessary when using different types of lantern slides. Still another object of my invention is to provide a lantern slide holder in which the lantern slides are positioned by pairs of opposing walls arranged at different angles so that a slide of one thickness will be positioned in one position in the carrier and a slide of another thickness will be positioned in another position in the same carrier.

It is well known that lantern slides, because of their construction, may vary widely in thickness. For instance, one of the most popular type of lantern slides consists of a cellulosic support having a picture-carrying element on one side, this support being carried in a light cardboard or paper frame. It is usually customary to varnish the picture carrying element so that finger prints will not readily be transferred to it. Such a lantern slide is quite thin. They are popular because they are extremely inexpensive.

A second known type of lantern slide consists of a cellulosic support carrying a picture element on one side, this picture-carrying element being protected by a sheet of clear glass. The picture-carrying element may be cemented to the glass or there may be two protecting pieces of glass one on each side of the picture-carrying element. If more than one sheet of glass is used a metallic binder or a tape binder may be used, so that it will be seen that there is normally a number of different thicknesses of lantern slides which may be used in the same projector.

Coming now to the drawing wherein like reference characters denote like parts throughout:

Fig. 1 is a front elevation of a lantern slide carrier constructed in accordance with and embodying a preferred form of my invention.

Fig. 2 is a top plan view of the carrier shown in Fig. 1.

Fig. 3 is an enlarged fragmentary detail section taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged fragmentary detail section similar to Fig. 3, but showing a portion of a slide of greater thickness in place.

Fig. 5 is an enlarged detail fragmentary section taken on line 5—5 of Fig. 1.

My invention is directed broadly to a lantern slide carrier which will accurately position at least two different thicknesses of lantern slides and which will position still other thicknesses of slides in approximately the best position for projection.

To accomplish this, I provide a pair of spaced rails which support standard lantern slides by their opposite edges, each of the rails consisting of a pair of walls arranged at different angles with respect to the carrier so that while one type of slide may be centered in the holder, a second type of slide may be decentered by an amount which will compensate for the thickness of the slide.

More specifically, I provide a lantern slide carrier which consists of a base plate or bar 1 which supports upstanding ends 2 and which may support an upstanding center member 3. On each end 2 of the lantern slide carrier, I provide a rail designated broadly as 4 for supporting one edge of a lantern slide. This rail may be formed up from sheet metal and may include two side walls 5 embracing the edges of the upstanding end 2 and having a slidable connection therewith through the studs 6 which pass through slots 7 in member 2 so that the rails may slide back and forth in seats 8 which may be conveniently countersunk in the end members 2. The end members 2 have a central bore 9 supporting a coil spring 10 which bears against and exerts an outward thrust upon a lantern slide, which may be designated broadly as L. The edge E of the lantern slide may be positioned by means of a pair of angularly disposed walls 11 and 12, the angle of wall 11 being different from the angle of wall 12 with respect to the lantern slide base plate 1.

I prefer to attach a guide plate 13 to one side of the rail member 5 and to form this inwardly and outwardly, as illustrated at 14, to provide guiding edges which, as best shown in Fig. 1, will project above the ends of the angularly disposed walls 12 and 11. These facilitate loading a lantern slide L into position in a darkened room, since one edge of the lantern slide may be rested upon the forming 14 before moving it downwardly between the supporting rails. The upstanding center member 3 is also provided with a rail which guides the opposite edge of the lantern slide holder L, this rail, indicated broadly as 15, being preferably attached by rivets 15a so that it will be immovable. As shown in Fig. 2, the fixed rail is also provided with a pair of

angularly disposed walls 16 and 17 which are preferably of the same angles as walls 12 and 11—that is, the angles of walls 12 and 16 are the same and the angles of walls 11 and 17 are the same.

Fig. 3 illustrates a slide L of the most inexpensive type. This slide may consist of a support S carrying on one side a picture P, there being on both sides of the picture-carrying element and support light cardboard or paper frame members F. The total thickness of this slide is comparatively slight and the picture-carrying side of the slide is spaced a distance d from the front edge wall of the picture carrier—that is, the edge wall which faces the projection lens.

In Fig. 4, I have illustrated another known type of lantern slide, designated broadly as L', this slide also including a support S', carrying a picture P' on one side. In this case there are two sheets of glass G which cover both sides of the picture-carrying element and all of these parts are held together by means of a binding B around the edges of the glass plates.

The angular relation of the walls 11 and 12 and 16 and 17 is so selected that when a thick slide L' is positioned between these walls, the distance D from the front wall of the holder to the picture-carrying element will be spaced from the projector lens a distance T greater than the picture-carrying element P' of the thin lantern slide L'. The reason for this is that in Fig. 4, the distance T is approximately equal to one-third of the glass plate G lying between the picture-carrying element and the objective and the distance T is selected so that it compensates for the refractive index of the glass. Therefore, if the lantern slides L' and L are both used in the same projector, it is unnecessary to focus the projector, even though these lantern slides are of quite different thickness and construction.

I prefer to design a lantern slide carrier so that it will accurately position two standard types of lantern slide and so that at least two types can be used without focusing. However, it happens that if this is done, the angular relationship of the walls 11 and 12 and 16 and 17 is such that it approximately positions the other standard types of lantern slides in approximately the proper plane, so that lantern slides of other known constructions can be used even though slight focusing may be necessary for some of them.

Actually, it is practically impossible to design a lantern slide carrier which would take care of all known types of lantern slides, because the distance T depends on the refractive index of the particular glass which may be used. The required spacing can be determined by the formula

$$\frac{N-1}{N}$$

where N is the refractive index of the glass. The glass normally used for lantern slides must be of fair quality and such ordinary glass has a refractive index of approximately one and one-half. Of course, different grades of glass can be used having a different refractive index, but this can be taken as substantially the standard type of material for making lantern slides.

I am aware that lantern slide holders have been suggested in which the two opposed edges of a lantern slide are held by a pair of rails having a V-shape in cross-section, but such holders have proposed opposite angular walls having the same angular relationship to the supporting plate for

the lantern slide holder. When the same angular relationship exists between both sets of walls, it will tend to center the picture-carrying element with respect to the holder so that a picture-carrying element utilizing a glass plate for protection on the side facing the objective will be out of focus by a distance of approximately one-third of the glass plate. Consequently, such lantern slide holders do not accomplish the same purpose as the lantern slide holder which I have described above.

At the present time, the lantern slide holders of a 2" x 2" size are generally one of two types, first, and most extensively used, a lantern slide holder made without glass, in which paper frames support a cellulosic picture-carrying element. Second, the same type of picture-carrying element is used sandwiched between a pair of glass plates. The thickness of these glass plates is substantially uniform, so that by designing a lantern slide holder with rails formed by two angularly disposed walls, one having a greater inclination relative to the slide holder than the other, I can provide a lantern slide carrier which can be used with the two main types of lantern slides without focusing, even though the thin or thick slides are used one after the other. If it should happen that certain slides have much thicker glass protection, the projector would have to be focused, but the focusing movement required would be less than would be required in the usual type of holder where the picture-carrying element is always centered with respect to the lantern slide carrier or where the picture-carrying element is always in the same position with respect to the lantern slide carrier.

I claim:

1. A holder for picture carrying slides for use in projectors including a source of light and an objective, said slides including picture carrying elements with or without a coverglass of known thickness, said holder including, in combination, a base plate, a pair of spaced rails on the base plate in spaced relationship, at least one rail being movably mounted, a spring tending to press the movably mounted rail towards the opposite spaced rail, each rail including a pair of walls arranged to form a substantially V-shaped groove, the walls being unsymmetrical, the angle of one rail being greater than the angle of the facing rail with respect to the slide holder, whereby a slide may be held to one side of the center of the spaced rails for projection, the inclination of one wall relative to the other wall being selected to space the picture-carrying element of a glass covered slide further from the objective of a projector than the picture-carrying element of an uncovered slide to compensate at least in part for the difference in focal plane between the two types of slides.

2. A holder for picture carrying slides for use in projectors including a source of light and an objective, said slides including a picture carrying element either without glass or covered by glass of a predetermined thickness including, in combination, a base plate, a pair of spaced rails carried thereby, means normally thrusting one rail toward the other, each rail including a pair of intersecting walls forming a substantially V-shaped groove to receive an edge of the lantern slide, the angular inclination of one wall of each rail differing from the angular inclination of the opposite wall, the inclination of the two walls being so selected as to position a slide covered by glass of a known thickness substantially one third of

the thickness of the glass further from the objective of a projector in which the slide holder is used than said walls would position a picture-carrying element not covered with glass, whereby the picture-carrying elements of both slides would lie automatically in the proper focal plane.

3. A holder for picture carrying slides for use in projectors including a source of light and an objective, said slides including a picture-carrying element either without glass or covered by glass of a predetermined thickness including, in combination, a base plate, a pair of spaced rails carried thereby, means normally thrusting one rail toward the other, each rail including a pair of intersecting walls forming a substantially V-shaped groove to receive an edge of the lantern

5 slide, the angular inclination of one wall of each rail differing from the angular inclination of the opposite wall, each of the facing pair of rails including walls facing the front of the slide carrier of one inclination and each of the facing pairs of rails including walls facing the back of the slide carrier including rails of the same inclination but differing from the inclination of the rails facing the front of the carrier, whereby 10 said rails may position the picture carrying elements of uncovered slides in one position and may position glass covered slides in another position with respect to one edge of the slide carrier to eliminate or minimize focusing of a projector 15 in which said different slides may be used.

CHARLES D. REID.