Dec. 10, 1929. K. BRENKERT ET AL 1,738,944

PROJECTION APPARATUS

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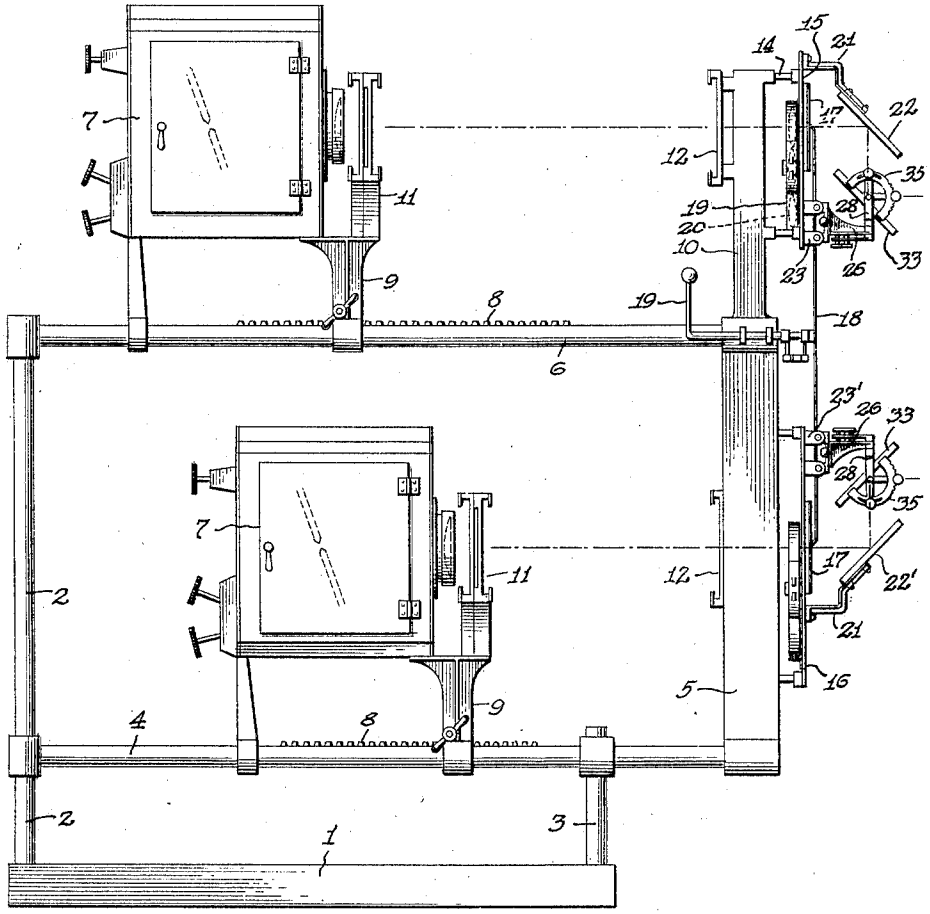



Fig. 1.

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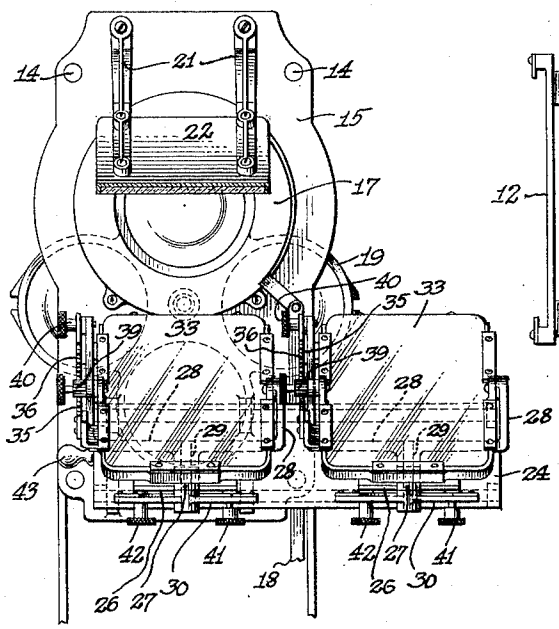


Fig. 2.

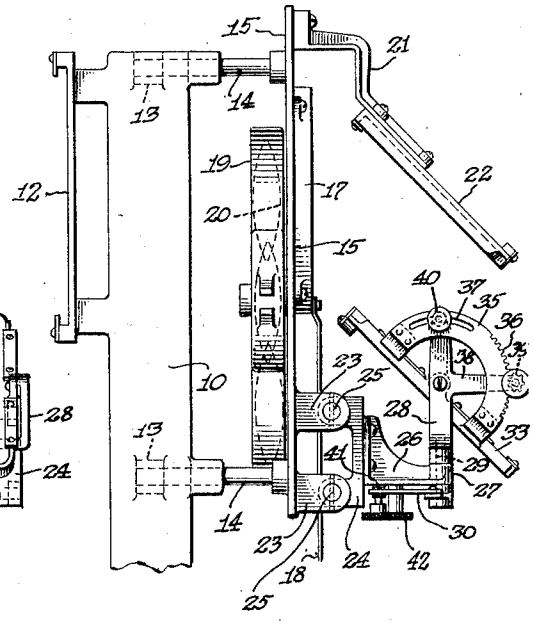


Fig. 3.

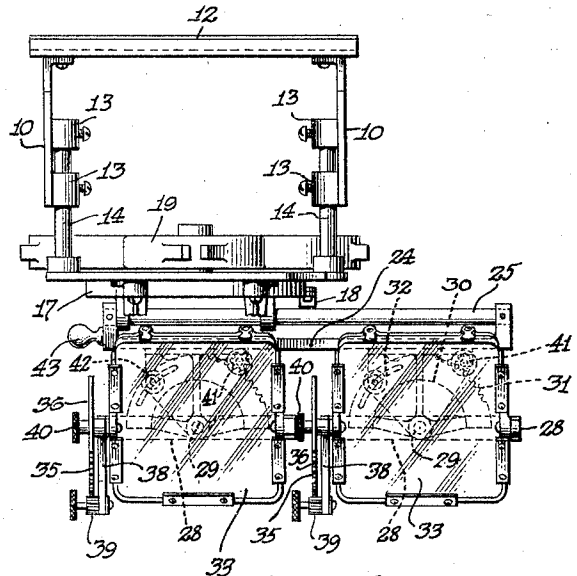


Fig. 4.

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# UNITED STATES PATENT OFFICE

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## PROJECTION APPARATUS

Application filed November 1, 1928. Serial No. 316,393.

The present invention pertains to a novel projection apparatus constructed particularly for use in theaters where a beam of light is to be projected upon a stage or screen.

The projected beam of light is required to be directed to various parts of the stage or screen at different times, and in the use of the present machines for projection, the operator is obliged to make a rapid and hurried adjustment of the apparatus at the instant when the change in the direction of the projection is required. Owing to the short interval of time in which the adjustment must be made, it is often necessary to use two machines, one of which is preset well in advance; otherwise, if only one machine is used, there is likely to be a delay or interruption in the program.

The principal object of the present invention is to provide an apparatus permitting an advance setting or adjustment for a future condition while the machine is in operation, so that the necessity for two machines is avoided. This object is accomplished by providing two projecting reflectors which are separately movable into the path of a beam of light such as that picked up from a light source by a reflector. Only one projecting reflector at a time can occupy an operative position in the beam of light, and while one projecting reflector occupies such operative position, the other may be set for a future condition in the program.

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

Figure 1 is a side elevation of the apparatus;

Fig. 2 is a front elevation of the upper part thereof;

Fig. 3 is a detailed side elevation of the upper forward part; and

Fig. 4 is a plan view of Fig. 3, with the reflector removed.

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

The apparatus is built on a base 1 having tall uprights 2 at the rear corners and short uprights 3 at the forward corners. These uprights support a lower track structure 4 at substantially the upper end of the uprights 3. This structure extends forwardly of the uprights 3 and carries at its forward ends a front frame member 5. The upper ends of the uprights 2 in conjunction with the member 5 support another track structure 6 similar to the track 4. The tracks support light sources 7 slidable thereon. The tracks are provided with rack members 8 engageable by pinions (not shown) carried by the light sources and turned by means of handles 9.

The upper part of the member 5 has a section 10 in line with the upper light source 7. The light sources carry double frames or receptacles 11 for receiving modifying devices such as slides, color screens or framing shutters, and the parts 5 and 10 carry frames 12 in line with the frames 11 and for a similar purpose.

The section 10 is provided with bosses 13 in which are received studs 14 extending from a supporting plate 15 at the forward side of the member 10. A similar plate 16 is supported in like manner by the member 5, and both plates are provided with dissolving shutters 17 operated in the usual manner by connecting linkage 18 and a crank 19. Obviously, the members 5 and 10 are open in front of the frames 12 to permit light to pass therethrough and reach the dissolving shutters.

On the back side of each plate is pivotally mounted a lens frame 19 carrying a plurality of lenses 20 of different focal lengths and adapted to be brought separately into the beam emitted from the respective light source. The light sources may be adjusted on their tracks to positions corresponding to the focal lengths of the several lenses, and each lens is accordingly used for a given position of the light source. The operation and utility of this arrangement are fully described in our copending application of even date.

The plate 15 carries a pair of brackets 21 to which is secured a reflector 22 overhanging the upper shutter 17 in such a manner as to intercept the beam of light issuing from the upper light source and to reflect it downwardly. The projecting reflectors for pick-

ing up light from the reflector 22 and throwing it upon the stage or screen are adjustably supported for the purpose which has already been indicated and which will presently be described in detail. The slidable mounting for such projecting reflectors includes lugs 23 formed at the lower end of the plate 15 and a slide member 24 having rods 25 slidably received in the lugs 23. The slide assembly further includes brackets 26 secured to the member 24.

Each bracket is formed with a boss 27 which supports a yoke 28 by means of a shaft 29 secured to the handle of the yoke and extending into the bearing 27. To the lower end of the shaft, extending beneath the bearing 27, is fastened a quadrant 30 having a toothed portion 31 and a slot 32. A mirror or other projecting member 33 is pivoted between the branches of the yoke 28. The member 33 also carries a quadrant 35 at one edge thereof, having a toothed portion 36 and a slot 37. From each yoke extends an arm 38 in which is journaled a pinion 39 meshing with the corresponding quadrant, whereby the mirror may be turned and adjusted on a horizontal axis. A locking screw 40 carried by the upper end of each yoke passes through the slot 37 of the adjacent quadrant 35, whereby the position of the mirror may be secured.

In like manner, a pinion 41 is journaled in each of the brackets 26 and meshes with the toothed portion 31 of the corresponding quadrant 30. Each of the latter quadrants is equipped with a locking screw 42 mounted in the bracket and passing through the slot 32 of the quadrant whereby the latter may be locked in any position determined by the actuation of the screw 41. It will now be seen that each of the pinions 41 serves to swing the corresponding yoke 28 and the projecting reflector 33 on a vertical axis.

Each of the members 33 has an adjusting assembly similar to that described, and a detailed section of only one is therefore deemed sufficient. The relation of the members 33 to the reflector 22 is such that only one of the former may occupy a full operative position at a time, during which the remaining member 33 is idle. The idle member may be adjusted on either or both of its axes for a different projection angle which may be necessary for a subsequent event in the program. When this event occurs, the apparatus is caused to project in the proper direction, merely by shifting the slide assembly by its knob 43 to remove the projecting reflector 33 previously in use, and to substitute the preset assembly in the path of the beam emitted by the reflector 22.

The lower forward member 5 is equipped with a similar assembly consisting of a single reflector and a pair of interchangeable and independently adjustable projection reflectors. The lower assembly is, however, inverted with respect to the upper assembly, and it will be seen that the reflector 22′ is at the lower portion of the plate while the slide lugs 23′ are at the upper part of the plate. Otherwise, the construction and operation are similar to that described in connection with Figs. 2, 3 and 4.

The compactness of the device is further enhanced by mounting the effect holder 12 on a fixed support and behind the lens and mirrors. As a result of this arrangement, the lens 20 may easily be interchanged for the purposes already described, and the direction of projection may be changed without moving the effect holder.

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 we claim is:—

1. A projection apparatus comprising a reflector, and a pair of projecting reflectors adapted to be moved selectively into and out of the path of said reflector.

2. A projection apparatus comprising a reflector, and a pair of projecting reflectors adapted to be moved selectively into and out of the path of said reflector, and means for adjusting said projecting reflectors on their respective axes.

3. A projection apparatus comprising a reflector, a slide supported near said reflector, and projecting reflectors carried by said slide and adapted to be moved selectively into the path of said reflector.

4. A projection apparatus comprising a reflector, a slide supported near said reflector, and projecting reflectors carried by said slide and adapted to be moved selectively into the path of said reflector, and separate means for adjusting said projecting reflectors on their respective axes.

5. A projection apparatus comprising a reflector, and a pair of projecting reflectors adapted to be moved selectively into and out of the path of said reflector, said projecting reflectors being separately supported for adjustment on both axes thereof.

6. A projection apparatus comprising a reflector, a slide supported near said reflector, and projecting reflectors carried by said slide and adapted to be moved selectively into the path of said reflector, said projecting reflectors being separately supported for adjustment on both axes thereof.

7. A projection apparatus comprising a reflector, a slide supported near said reflector, and a pair of yokes pivotally supported by said slide, means for securing said yokes in positions of pivotal adjustment, projecting reflectors pivotally mounted in said yokes, means for securing the adjustment of said

projecting reflectors in said yokes, said projecting reflectors being adapted to be moved respectively into the path of said reflector.

8. A projection apparatus comprising a reflector, a slide supported near said reflector, and a pair of yokes pivotally supported by said slide, quadrants carried by said yoke, pinions rotatably mounted in said slide and engaging said quadrants, projecting reflectors pivotally mounted in said yokes, means for securing the adjustment of said projecting reflectors in said yokes, said projecting reflectors being adapted to be moved respectively into the path of said reflector.

9. A projection apparatus comprising a reflector, a slide supported near said reflector, and a pair of yokes pivotally supported by said slide, means for securing said yokes in positions of pivotal adjustment, projecting reflectors pivotally mounted in said yokes, quadrants carried by said projecting reflectors, pinions carried by said yokes and meshing with said quadrants, said projecting reflectors being adapted to be moved respectively into the path of said reflector.

10. A projection apparatus comprising a reflector, a slide supported near said reflector, and a pair of yokes pivotally supported by said slide, quadrants carried by said yokes, pinions rotatably mounted in said slide and engaging said quadrants, projecting reflectors pivotally mounted in said yokes, quadrants carried by said projecting reflectors, pinions journaled in said yokes and meshing with said last named quadrants, said projecting reflectors being adapted to be moved respectively into the path of said reflector.

11. A projection apparatus comprising means for producing a beam of light, and a pair of projecting reflectors adapted to be moved selectively into and out of the path of the beam produced by said means.

12. A projection apparatus comprising means for producing a beam of light, and a pair of projecting reflectors adapted to be moved selectively into and out of the path of the beam produced by said means, and means for separately adjusting said projecting reflectors on their respective axes.

13. In a projection apparatus, a supporting member, an effect holder and a projection lens at opposite sides of said member, and a reflector close to said lens and adapted to receive light passing through said holder and lens.

14. In a projection apparatus, a supporting member, an effect holder and a projection lens at opposite sides of said member, a reflector close to said lens at the forward side of said supporting member and adapted to receive light passing through said holder and lens and an adjustable projecting reflector adapted to receive light from said first named reflector.

In testimony whereof we affix our signatures.

KARL BRENKERT.
JOSEPH W. BRENKERT.