June 15, 1943. R. S. HOPKINS 2,322,023

DEVICE FOR EXHIBITING TRANSPARENCIES

Filed Nov. 26, 1941 3 Sheets-Sheet 1

FIG. 1.

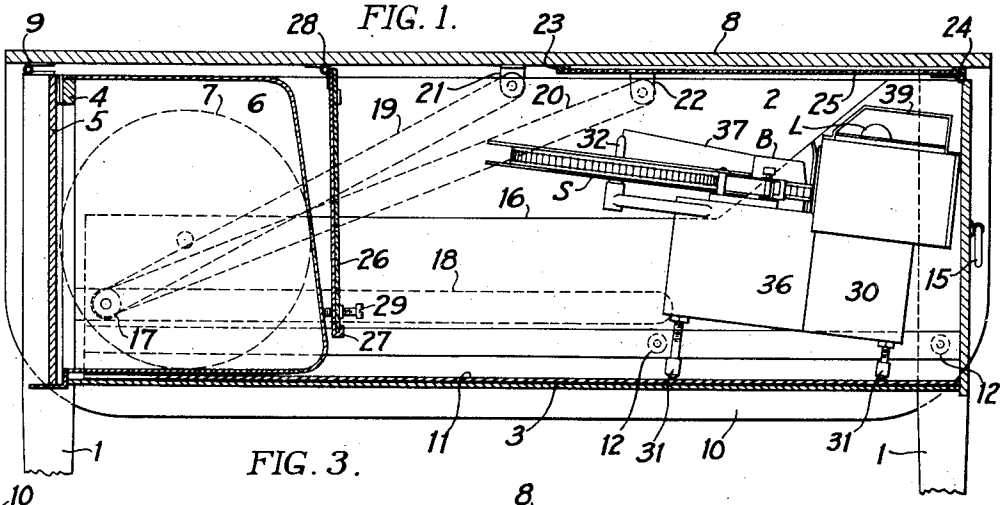


FIG. 3.

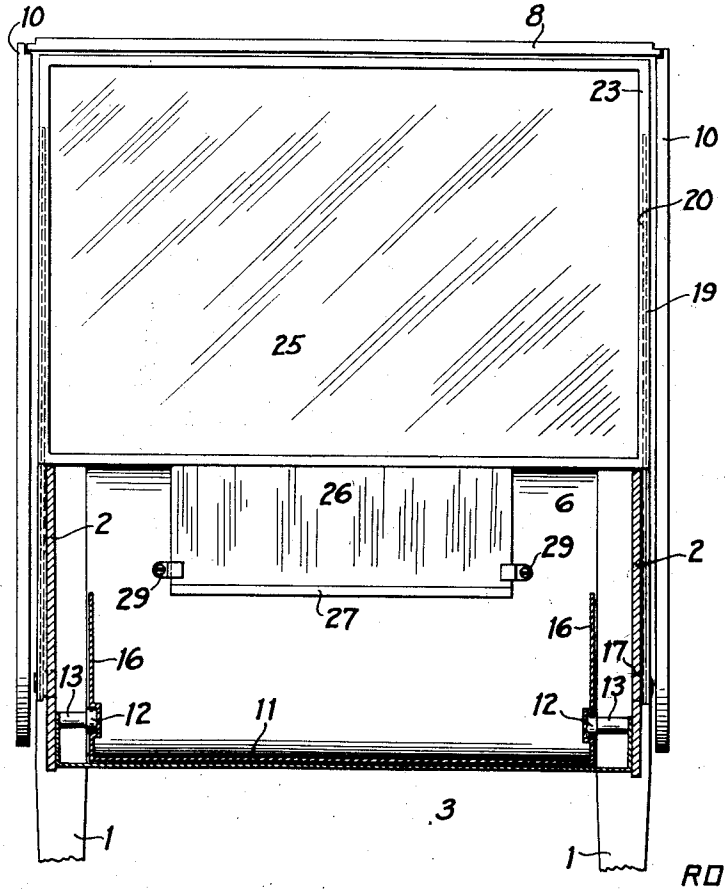


FIG. 5.

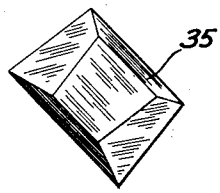
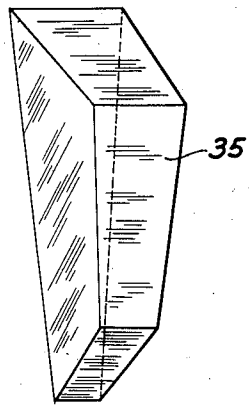


FIG. 6.



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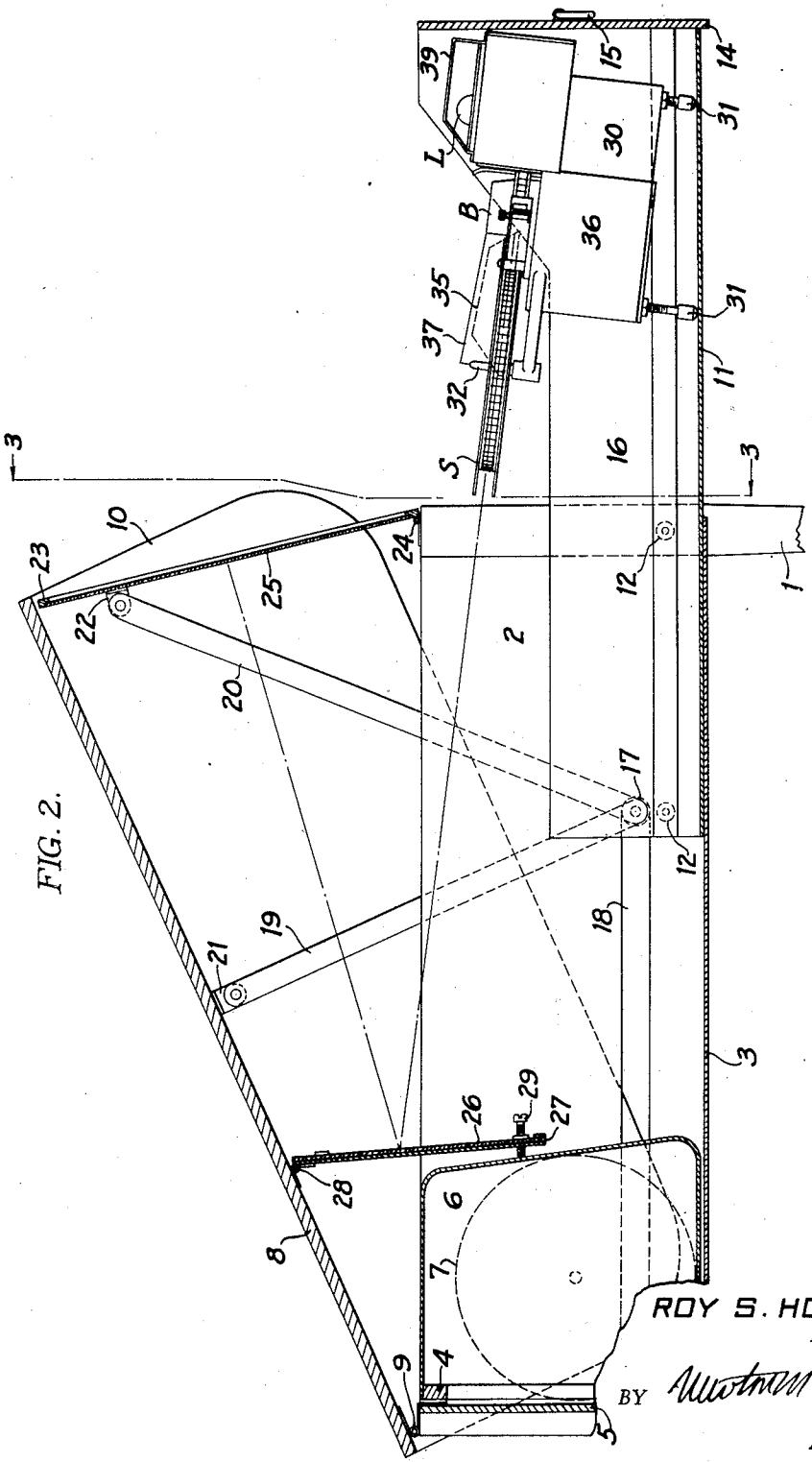
BY

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June 15, 1943. R. S. HOPKINS 2,322,023

DEVICE FOR EXHIBITING TRANSPARENCIES

Filed Nov. 26, 1941 3 Sheets-Sheet 2



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DEVICE FOR EXHIBITING TRANSPARENCIES

Filed Nov. 26, 1941 3 Sheets-Sheet 3

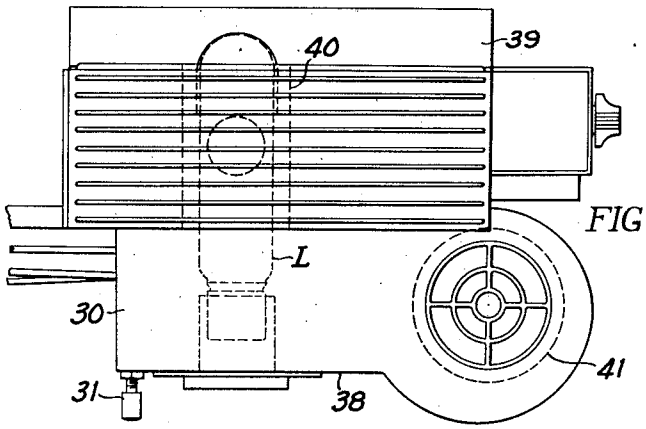


FIG. 7.

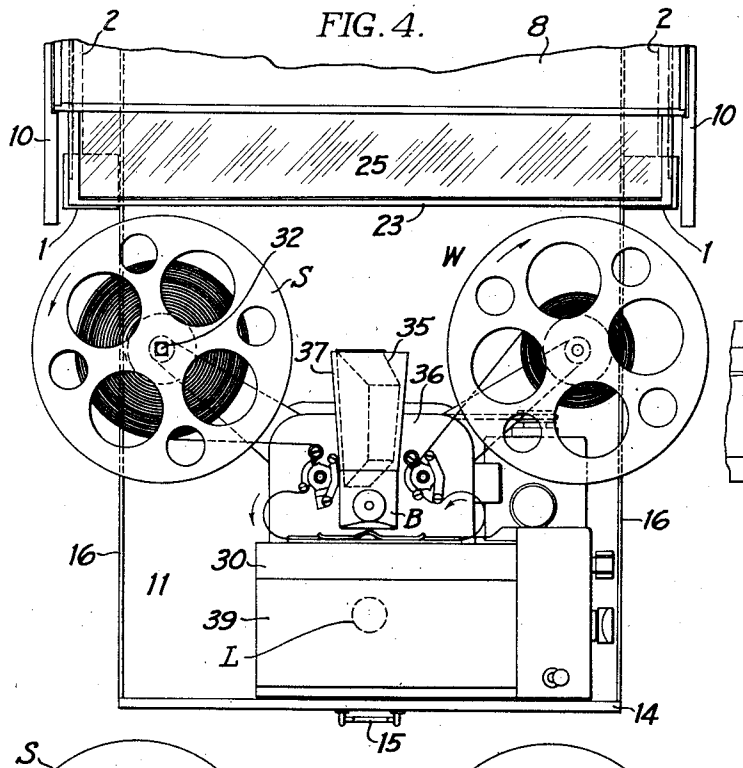


FIG. 4.

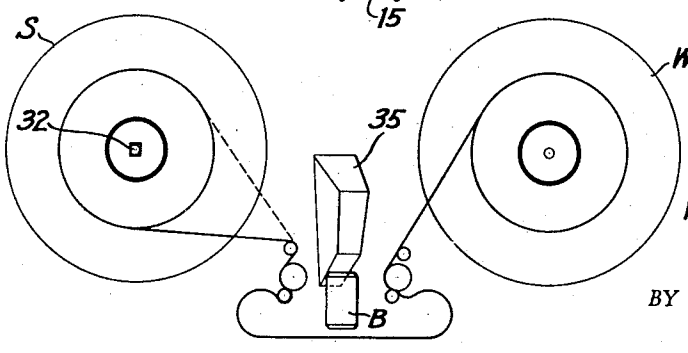


FIG. 8.

FIG. 9.

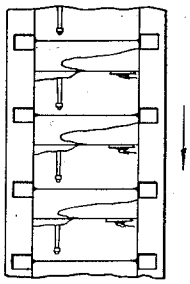
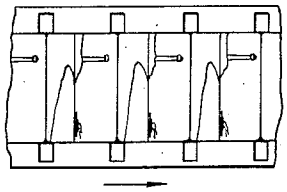


FIG. 10.



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Patented June 15, 1943 2,322,023

UNITED STATES PATENT OFFICE

2,322,023

DEVICE FOR EXHIBITING TRANSPARENCIES

Roy S. Hopkins, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey

Application November 26, 1941, Serial No. 420,551

6 Claims. (Cl. 88—24)

This invention relates to devices for exhibiting transparencies, and a principal object thereof is to produce, as a complete article of manufacture, a cabinet in which is mounted a projector of either the cinematographic or "still" type, such cabinet being an attractive piece of living-room furniture when out of use as an exhibition device, but which contains a screen, a projector, spare films, and other accessories for projection.

A further object of the invention is to produce an article as above set forth which, by simply pulling out a sliding drawer, is immediately transformed from a table into a complete device for exhibiting transparencies in a room such as a living room of the average home. Then by sliding the drawer in again it will be restored to the appearance of a table. This action, to be described hereinafter, is accomplished through a simple linkage, the design and arrangement of which constitutes one feature of the invention.

The invention, briefly outlined above, will be described in detail in the following subject matter. To aid in a clear and precise understanding of the complete assembly, the drawings herewith illustrate the invention in a specific form; which, however, may be varied in certain particulars without departing from the scope of the invention.

In the drawings:

Fig. 1 is a longitudinal central vertical section through the transparency exhibiting device when completely collapsed, in which state it is usable as a table;

Fig. 2 is a similar view of the device as erected or unfolded for exhibiting transparencies;

Fig. 3 is a transverse vertical section on line 3—3 of Fig. 2;

Fig. 4 is a top plan view of part of Fig. 2;

Figs. 5 and 6 are end and top views, respectively, of a prism used between the objective and the screen;

Fig. 7 is an end view of the lamphouse and fan casing of a projector;

Fig. 8 is a plan view, somewhat diagrammatic, of parts shown in Fig. 4;

Fig. 9 is a fragment of a motion picture film as it appears from the lamp side of a projector when the latter is used normally; and

Fig. 10 is a similar view of a film as it appears from the same viewpoint when a projector is used as in this invention.

The transparency exhibiting device, as previously mentioned, may be adapted for projection of either moving pictures or still "slides." The drawings, however, show only the arrangement for use with a motion picture projector of the 16-millimeter type, as altered to suit the particular requirements of the invention.

The device when made up as a table may have four legs 1 connected by side panels 2, the latter having a metal bottom piece 3 by which the sides are connected and braced. A rear end frame 4 may support doors 5 forming a closure for a small cabinet 6 in which extra reels 7 of film may be stored. A top 8 of decorative wood or other suitable material may be hinged at 9 to the rear legs and may have harmonizing drop-leaf sides 10 that may be swung up in the usual manner.

Between the side panels 2 a sliding receptacle 11 similar to a drawer is mounted to move in and out, preferably being carried on anti-friction rollers 12 that are supported by studs 13 on the upturned edges of the bottom piece 3. The front 14 of the drawer may have the same ornamental finish as the top 8 and drop-leaves 10, and a handle or drawer-pull 15 is provided for convenience. The drawer has no back, so that the bottom may slide under the compartment 6.

On the sides 16 of the drawer 11 near their rear ends are studs 17 extending outwardly through slots 18 in the side panels 2. Pivotally attached to these studs are links or bars 19 and 20, in duplicate on opposite sides of the apparatus. The links 19 are pivoted at their upper ends to brackets 21 attached to the underside of the table-top 8, and the links 20 are pivoted to brackets 22 on a frame 23 that is hinged at 24 to the front pair of table legs 4. The frame 23 carries a viewing screen 25 of suitable translucent material, such as ground glass, cellulose acetate, paper, fabric, etc., so that a projected image on its rear or inner face will be visible through the screen on its front or outer face.

Movement of the drawer 11 outwardly causes the links 19 and 20 to assume the position indicated in Fig. 2, thereby erecting the screen 25 into a convenient position for viewing a projected transparency, and simultaneously raising the table top clear of the screen and holding the top up as shown. As the table-top 8 rises, a reflector 26 is lifted into a position in which it will reflect a projected image onto the inner face of the screen 25. This reflector is supported by a frame 27 hinged to the top 8 at 28. Adjustable stops 29 bear against the front of the cabinet 6 so that the reflector will always resume a given angular relation to the screen when the drawer is pulled out.

When the drawer 11 is pushed back into the table, the links 19 and 20 pull the screen 25 and the top 8 down to their horizontal positions (Fig. 1) and the whole assembly is then indistinguishable from a conventional small "drop-leaf" table.

To produce an image of a transparency such as a motion picture film on the screen 25 a projector 30 is mounted on adjustable studs 31 to rest on the bottom 11 of the movable drawer, close to the front 14. In order to carry the image to the screen, the projector is set at a

slight angle from the horizontal, as clearly shown in Figs. 1 and 2, so that a beam is projected rearwardly to the reflector 26 and thence forwardly to the inner face of the screen 25.

A 16-millimeter projector as usually constructed is too tall to fit in any drawer that would be of correct proportions for a well-designed table, and therefore it becomes necessary in reducing this invention to practical form to devise a projector of a different height. To avoid the necessity of a complete redesign, it has been found that by laying the ordinary projector on its side, with the reel spindles uppermost, and by adding a special prism in front of the objective, and also rearranging the lamp, that a satisfactory image may be projected to appear in its normal orientation on the screen. The only variation from the usual operation is that the supply reel S must be placed on the spindle in the reverse of its normal manner, that is, the square center hole is to be outermost; in this case on top. To provide for so placing the supply reel, the spindle 32 is turned down to the diameter of the round portion for a length slightly greater than the overall depth through the core of the reel. The film then is led over the feed sprocket in the manner indicated in solid lines in Fig. 8, whereas the normal path of the film would be as shown in broken lines.

Because the projector is laid on its side instead of standing upright, it is obvious that the projected image also will be 90 degrees from normal unless some means are provided for re-orienting the beam between the machine and the screen. To accomplish this, the special prism 35 shown in Figs. 5 and 6 is mounted on the housing 36 of the projector mechanism, and is protected by a shield 37. This prism receives from the objective B images from a film which, if viewed from the lamp housing would appear as in Fig. 10, and then turns the projected image 90° about the optical axis. Inasmuch as the film is "inside out" as compared with its position in a projector standing normal or upright, it will be reversed, right to left, on the rear face of the screen 25 but as the latter is viewed from the front or outer side, the image will appear correctly to observers in the room.

The other alteration in the projector consists in mounting the lamp L on the wall 38 (normally a side wall of the lamp housing), and then providing a cover 39 to create a lateral vent passage for heated air from the lamp sleeve 40. The fan 41, the windup reel W, and the projector driving mechanism require no alteration.

From the foregoing description of the specific form of the invention illustrated, it will be observed that by making a few simple changes in a standard projector to adapt it to the table structure a device is provided which may be set up for the viewing of motion pictures by merely pulling out a drawer, and, of course, connecting the projector to an electric power source as usual.

The same type of apparatus may be used to exhibit "still" transparencies, but as most projectors used for standard slides may stand upright in such a drawer as is shown herewith the prism 35 would not be required. The drawings do not illustrate this type of projector, but it should be understood that a structure embodying such a device may be considered as within the terminology of the following claims.

I claim:

1. A device for exhibiting transparencies comprising a table having a top and a screen, both normally disposed in a horizontal plane, a hinged connection between the top and the table and between the screen and the table on which the top and the screen may tilt upwardly, a sliding drawer in the table, links connecting the drawer with the table top and the screen whereby outward movement of the drawer causes the screen to be erected, a projector within the drawer, and a reflector within the table arranged to direct a projected image to the screen.

2. A device for exhibiting transparencies comprising a table having a hinged top, a screen hinged to the table, a sliding drawer in the table, linkage between the drawer, the table top and the screen whereby the screen is erected and the table top is raised free of the screen when the drawer is withdrawn, a transparency projector in the drawer, and a reflector arranged to reflect a projected image onto the screen, said reflector being positioned by the movement of the table top.

3. A device for exhibiting transparencies comprising a table having a hinged tiltable top, a translucent screen hinged to the table and adapted to be folded thereinto, a drawer slidable in the table, links connecting the drawer with the table top and the screen whereby an outward movement of the drawer tilts the table top and erects the screen, a motion-picture projector in the drawer and arranged to have the film move transversely of the drawer, a rectifying prism adapted to receive an image from the projector and to erect said image, and a reflector arranged to receive the erected image from the prism and to reflect said image onto the inner face of the screen.

4. A projection device for moving picture films comprising a projector of standard type arranged to lie in a position with the film reels substantially horizontal and in which the film travels substantially laterally, a sliding support for the projector, means for receiving an image from the projector and for re-orienting the image to a normal position, a reflector, a screen, means for erecting the screen when the projector support is moved, and a casing for the projector and the screen simulating a table or like article of furniture.

5. A projection device for moving picture films comprising a projector of standard type arranged to be operated with the film reels in a plane at a slight angle to the horizontal so that film travels in a substantially horizontal direction from the supply reel of the projector to the windup reel thereof, a sliding support for the projector, a translucent screen, means for erecting the screen to viewing position by movement of the sliding support, a rectifying prism, and a reflector adapted to reflect a rectified image to the screen.

6. A projection device for transparencies comprising a table having a tilting top, a drawer movable outwardly and inwardly, a horizontally pivoted screen, a movable reflector, a projector mounted in the drawer, and links connecting the drawer with the table top and with the screen, whereby an outward movement of the drawer simultaneously positions all of the above members in operative relation and an inward movement of the drawer restores said members to retracted positions within the confines of the table.

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