May 22, 1951 R. E. BROWN 2,553,745

APPARATUS FOR PROJECTING IMAGES

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Fig. 1.

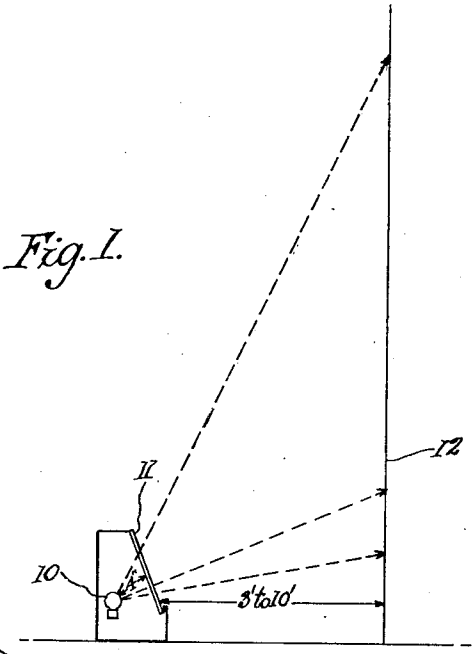



Fig. 2.

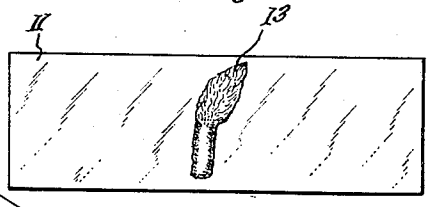






Fig. 3.

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Fig. 4.

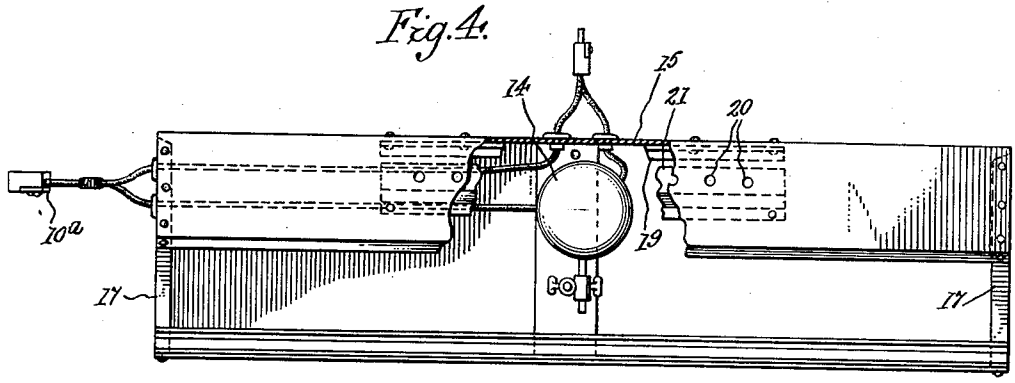
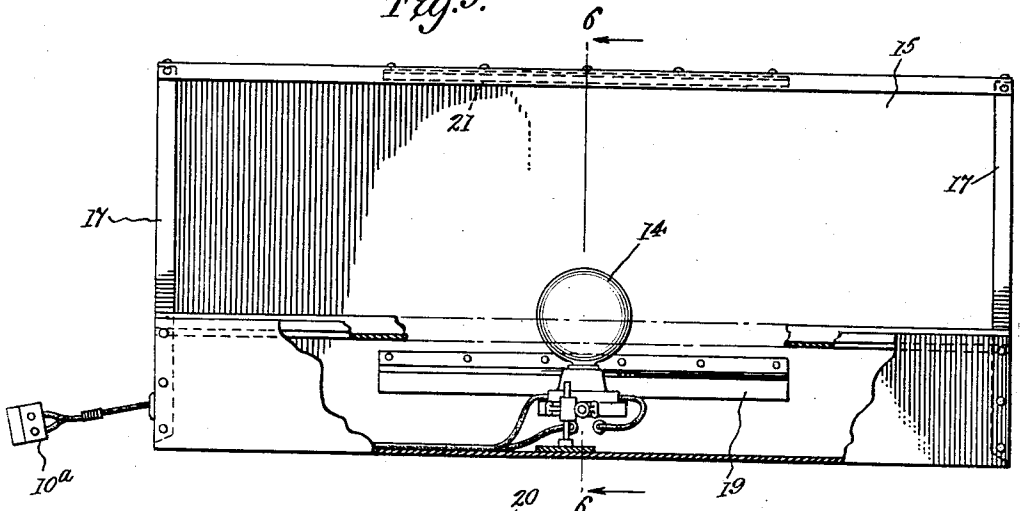



Fig. 5.



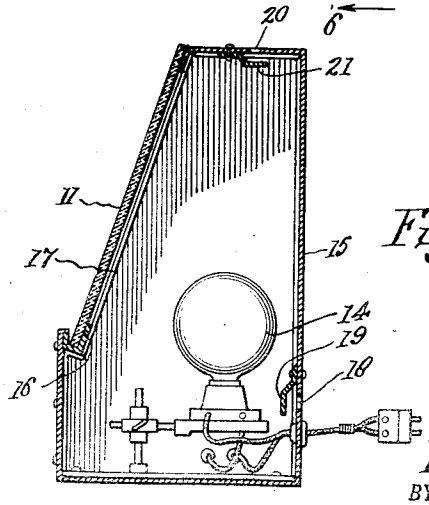




Fig. 6.

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# UNITED STATES PATENT OFFICE

2,553,745

## APPARATUS FOR PROJECTING IMAGES

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Application February 18, 1946, Serial No. 648,304

3 Claims. (Cl. 272—10)

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The present invention relates to a method and apparatus for forming backgrounds for stage use in theatres, or other amusement houses.

The primary object of this invention is to provide a simple and effective means of projecting a substantially undistorted image upon a screen and eliminating the use of all lenses.

Another object is to provide an apparatus for projecting a substantially undistorted image upon a screen wherein there is employed a substantially pin point source of light in combination with a transparent object holder.

Yet another object is to provide an apparatus for projecting a substantially undistorted image upon a screen wherein the object holder can be brought into close proximity with the screen by having the said object holder inclined from the vertical relative to a pin point type of light source.

Still another object is to provide an apparatus for projecting images including a non-reflecting housing for a light source having air ventilating holes so arranged with respect to said light or heat source as to create or promote convection of heat upwardly and outwardly of the said housing through the ventilating holes, and with said ventilating holes having means associated therewith to preclude light from entering into the housing but permitting the free flow of air therethrough.

Yet another object is to provide an apparatus, of the class described, comprising in combination, either in whole or part, a light source, a non-reflecting housing for said light source, air ventilating means for the housing, means to prevent light from entering the housing through said ventilating holes, and an object holder removably carried by the said housing.

Other and further objects and advantages of the present invention will be apparent from the following description thereof and from the claims appended thereto.

In the drawing wherein like numerals refer to like or corresponding parts throughout the several views,

Figure 1 depicts a schematic sketch embodying the features of the present invention.

Figure 2 shows a transparent plate upon which appears an object to be projected.

Figure 3 is a perspective view of a non-reflecting housing for the light source employed in the practice of the invention.

Figure 4 is a top plan view of the non-reflecting housing, with parts broken away.

Figure 5 is a front view of the non-reflecting housing, with parts broken away, and

Figure 6 is a sectional view taken along the line 6—6 of Figure 6.

Referring now to the drawing, the numeral 10 generally represents a light source, which is employed in the practice of the invention wherein light is transmitted from a substantially pin point source through a transparent plate 11 upon a screen 12. On the object plate 11 is disposed an object 13, which may represent any desired artistic scenery, which is employed in forming backgrounds for stage use. The plate 11 is transparent and the representation 13 is disposed thereon, as by means of opaque pigments, dyes, or transparent paints. These materials may be of any desired color, or combination of the spectrum colors. With reference to the light source 10, the object 13 may be painted either on the inside of plate 11, or on the outside thereon.

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The light source 10 should be of pin point type, and the following projector lamps are suitable: G. E. 108 P25/2—6 v. Med. Sc.; G. E. 18A/T 10/3—6 v. Med. Sc.; G. E. 18A/T–10P—6 v. Med. Sc.; G. E. 108 P25/1—6 v. Med. Sc., and also these same lamps, with Med. pre-focus bases.

Referring now to Figures 3, 4, 5 and 6, the light source generally represented as 10, is shown as a projector lamp 14 disposed within a non-reflecting housing generally represented as 15, made of metal or other suitable material. Said housing 15 comprises top, bottom, rear and side walls, and is provided with an open front, having a channel member 16 in which the plate 11 is adapted to slide. The edge 17 of each of the side walls of the housing 15 slopes at an angle of approximately 20° from the vertical, so that the plate 11 when it is disposed in groove 16 rests at an angle of approximately 70° from the horizontal and 20° from the vertical, having in mind that the projector lamp 14 is vertically disposed.

As the projector lamp 14 throws off heat, it is desirable to have air inlet holes to permit air circulation within the housing 15. It is important that these air inlet holes permit the air to infiltrate into the housing 15, but at the same time to keep light rays from being disseminated outwardly therethrough. To accomplish this purpose, a series of air inlet holes 18 are disposed in the rear wall of the housing 15, at a point in a horizontal plane below the bulb of the projector lamp 14. A baffle plate 19 is secured to the inner surface of the rear wall of the housing 15, in spaced relation thereto, in such a manner that light cannot penetrate out of the housing 15, but air can flow through the apertures 18. There is also provided, in the top wall of the housing 15, a series of air inlet openings 20. A baffle plate 21 is secured to the inner side of the top wall of the housing 15, in spaced relation to the apertures 20, so that air can flow through the said apertures 20, while light does not penetrate into the housing. The air inlet openings 18 in the rear wall of the housing 15 and the openings 20 in the top wall of said housing 15, form a natural draft wherein cool air is sucked through apertures 18 and the heated air flows upwardly and outwardly

through the apertures 20 to thus keep the inside of the housing 15 at an appropriate temperature and to prevent overheating.

In the operation of the apparatus for projecting enlarged images upon a screen 12, a transparent plate 11, may be approximately 13 inches wide and 40 inches long, having an object 13 painted thereon, is slid into groove 16, of the housing 15, and rests at an angle from the vertical and is parallel to the sloping wall 17 of said housing 15. Light rays are obtained by plugging the projector lamp into a suitable source of current. Since the G. E. lamps listed above operate on 6 volts at 18 amps, transformers or resistors are usually required. A resistor can be plugged in at 10a. Light rays are radiated or cast through the transparent object plate 11 and an image is formed on a screen 12, which may be placed anywhere from three feet to ten feet from the housing 15.

I am aware that I am not the first inventor of a method and apparatus for projecting images, without employing lenses. The Linnebach Patent #1,635,795 broadly teaches a method and apparatus for projecting images upon a screen and including a light source, an object plate having an object painted thereon, and a screen to receive an enlarged image.

My invention is an improvement over the Linnebach Patent #1,635,795, as it provides a substantially clear cut image, and because of the angle at which the object is disposed relative to the light source, the housing 15 can be moved closer to the screen upon which the images are being projected. It is to be noted that at the closest point in my invention, the light source is approximately four inches from the object plate 11, and that the screen 12 may be placed anywhere from three to ten feet from said plate 11, while still obtaining undistorted images. Also, because of the fact that I dispose the object plate 11 angularly with respect to the light source 10, I am able to employ a much smaller and more compact plate 11, which makes it easier for my apparatus to be operated. The transparent object plate 11 is preferably tempered to make it more resistant to easy breakage and withstand thermal shock. Where the object plate 11 is disposed at an angle from the vertical, or is otherwise not parallel to the screen, the object 13 must be geometrically distorted to provide an undistorted image.

Also, my housing 15 is an improvement over the prior art, in providing a substantially non-reflecting container for the light source 10, which is additionally ventilated to carry off the heat developed within the housing 15 by the operation of the light source 10. It is important that heat waves are not developed within the housing 15, as this tends to produce an image which is not as clear, as where the heat is carried off promptly.

I am able to provide or obtain a wider angle of spread both horizontally and vertically for the light rays projected through the object plate 11, because I employ a substantially point source of light which permits a closer disposition of the light source to the object holder, which is preferably disposed at an angle from the vertical or is non-parallel to the screen.



It is to be understood that various modifications of this invention will be apparent to those skilled in the art, without departing from the spirit of this invention, and I desire to be limited only by the scope of the appended claims.

What I claim is:

1. An apparatus for projecting enlarged undistorted images of objects comprising, a substantially vertically disposed screen upon which the images are to be projected, a non-reflecting housing having an open front and also having sides with sloping front edges, a projector lamp within said housing adapted to give substantially a pin-point light, a transparent object holder removably supported by said sloping front edges of said housing and being disposed in non-parallel relationship to said screen, and said object holder having a geometrically distorted object painted thereon.

2. An apparatus for projecting enlarged undistorted images of objects comprising, a substantially vertically disposed screen upon which the images are to be projected, a non-reflecting housing, an object holder carried by said housing, a projector lamp within said housing adapted to give substantially a pin point light, said housing having air inlet holes disposed below the projector lamp and air outlet holes disposed above said projector lamp, whereby a natural draft is set up within the housing which sucks cool air into the housing through the holes below said lamp and draws the heated air upwardly and outwardly through the holes above said lamp, means associated with said holes to prevent light from the housing escaping therethrough, said non-reflecting housing having an open front and also having sides with sloping edges adapted to removably carry the object holder at an angle from the vertical with said object holder being disposed in non-parallel relationship to said screen, and said object holder having a geometrically distorted object painted thereon.

3. An apparatus for use with a screen to project enlarged undistorted images of objects thereupon comprising, a non-reflecting housing having an open front and also having sides with sloping front edges, a projector lamp within said housing adapted to give substantially a pin point light, a transparent object holder removably supported by said sloping front edges of said housing, and said object holder having a geometrically distorted object painted thereon.

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