Oct. 4, 1932. R. GEYLING ET AL 1,881,355

DEVICE FOR PROJECTING BACKGROUNDS

Filed Jan. 26, 1928

Fig. 1

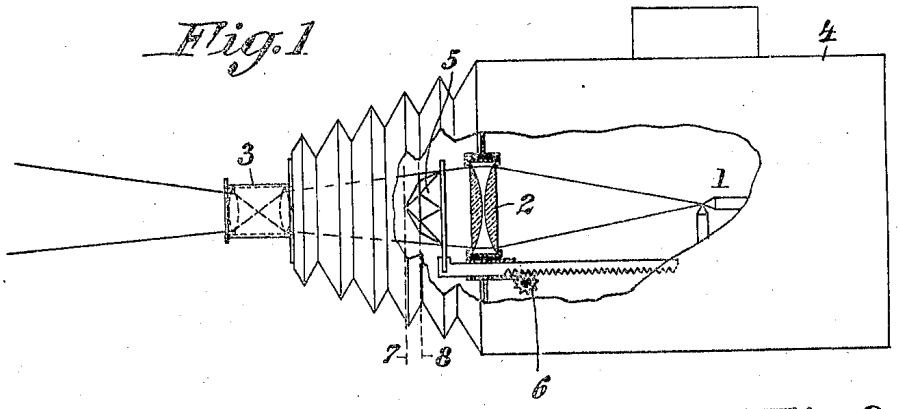


Fig. 2

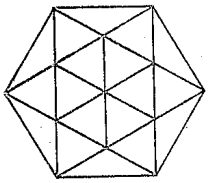


Fig. 3

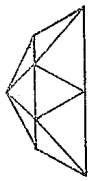


Fig. 5

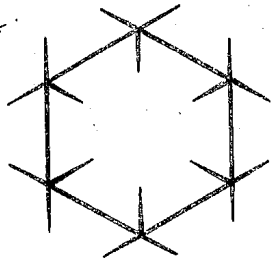
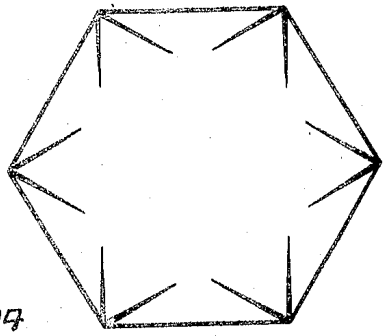


Fig. 6



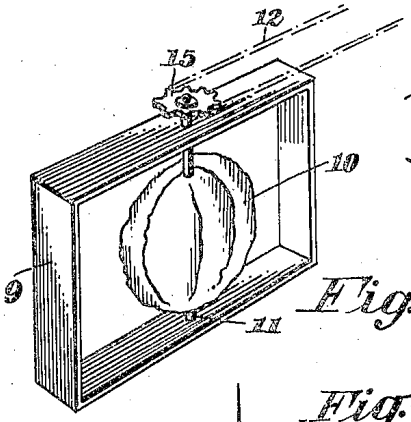


Fig. 8.

Fig. 4.

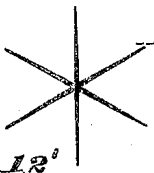


Fig. 7

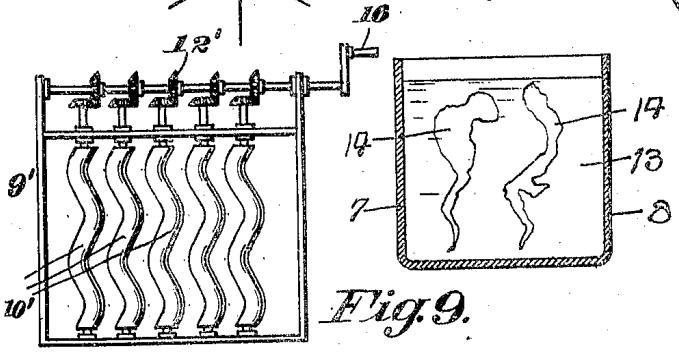


Fig. 9.

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UNITED STATES PATENT OFFICE

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DEVICE FOR PROJECTING BACKGROUNDS

Application filed January 26, 1928, Serial No. 249,760, and in Austria January 13, 1927.

This invention relates to a method of producing particular effects during the projection of backgrounds and the like for theatres, exhibitions, puffing advertisements and so forth, particularly for such stage-backgrounds as are used in place of the antiquated painted backgrounds, which have become useless in view of improvements in connection with the stage-illumination.

According to requirement the background is represented by projection, whereby the part of the stage on which the play proceeds can be fully illuminated without interfering with the intensity of light of the projected image and without persons or articles present in front of this image throwing a shadow. The painted background with its immovable details is fatiguing and also does not assist the play, and therefore the modern staging urgently calls for backgrounds, which support the play with some sort of change in shapes and colors without the employment of actual articles. Desired effects, which cannot be obtained by the known means, can be produced by pictures, which varyingly change in shape and color, move up and down and after scarcely having been fixed, fade out in order to make room for new pictures, and further also by real bright and refracted light. Besides the technical difficulties in projecting images of the required size, the kinematographic projection is not suited for the present object particularly in consequence of the danger, that it may appear to be inappropriately rendered effective in dark show-rooms and stages only.

The essential feature of the present invention consists in utilizing instead of the known projection-images which essentially lie in a plane, light-permeable spatial structures, which are of a considerable size also in the direction of the passage of the rays of light.

As a further feature of the present invention the structures to be projected are mechanically moved, or are moved and maintained in motion by physical or chemical actions. As a final part of the invention the structures to be projected are produced by physical actions (for instance mixing, solution) or by chemical actions (for instance precipitation).

Some examples are described hereinafter.

1st Example

Regularly or irregularly grouped precious stone imitations of cut glass are cemented onto a plate of glass. During the projection only those faceted edges which lie substantially in the focussing plane are projected sharply and the result is a pattern, which varies on adjusting the glass-plate in the optical, because continually different faceted edges are projected sharply, while other faceted edges are not as sharp. Further on the background are produced refractions and reflections and in the cut glass-members star-shaped and comet-like pointed light-pencils, which enliven the pattern and on shifting the glass-plate produce peculiar effects in view of their quick change. The variety may be still increased by adjusting the lenses of the objective, whereby again differently shaped parts of the glass-member are sharply focussed.

As 2nd Example may be taken the projection of balls of glass of peculiar shape, such as are formed and remain as waste-products from glass-making. By rotating such members about an axis during the projection or displacing the same with respect to one another, waves or clouds are imitated as far as their illumination and motion is concerned.

3rd Example

In a frame, which is inserted in the projection apparatus in place of the image-plate, are disposed a number of glass-bars or rollers, which are of any desired shape but preferably are of irregular shape and which are differently colored or painted. The bars or rollers are connected with one another or with an operating device by means of toothed wheels or the like, so that they can be rotated either together or independently of each other. It is a consequence thereof that during the rotation are projected places of different thickness and if desired also of different colors, and intentional raising and

lowering is produced, which illustrates the rolling of waves, clouds, levers and so forth.

4th Example

One or more glass-cases are inserted into the projection-apparatus in such a manner, that they are disposed in front of or behind the image to be projected onto the background. If the case filled with liquid is subjected to different physical or chemical actions, effects will be produced, some of which are stated hereinafter.

(A) Actions of peculiar effects, waves and clouds, snow-storms, rain or sleet may be produced by blowing air or the like into liquid by way of a pipe, provided with very small holes and resting on the floor of the case. The raising bubbles are projected as falling members and yield novel effects.

Also members of any desired shape and colors, for instance ball-shaped or star-shaped members, may be inserted in the case and they be of such a specific gravity, that they float in the liquid or sink to the bottom very slowly only. Now these members, as well as the liquid may be stirred up by blowing in air or duct-like substances or by agitating the contents by means of any convenient mechanical agitating device, so that during the projection also stagy effects and a variety of color-effects are produced in a very effective manner.

(B) If a heavy liquid, for instance glycerin, which may be colored or clear, is poured into the clear or colored contents of the case, the streaks arising during the slow sinking of the gradually mixing glycerin will imitate, during the projection, the effect of rising vapors and the like.

(C) If the case is filled with a weak solution of soda and the glycerin is mixed with a weak nitrate of lead solution, the effect of a dense fog will be produced by the white precipitation of carbonate of lead. Rising smoke (blasting and the like) can be imitated by producing dark precipitation.

(D) A great variety of effects can be produced by introducing slowly sinking insoluble or soluble color-powders into the liquid. Especially soluble color-members yield particularly fanciful effects of rising structures which send out tree-like branches, which attract complete attention in consequence of the variety of shapes and colors. Illustration of fire.

Other effects may be produced by rotating discs, which preferably run on ball-bearings and on which are arranged glass-plates, either painted or provided with drawings and plastic transparent structures.

A preferred form of the invention is shown in the accompanying drawing wherein:

Figure 1 shows the construction of a projection apparatus for carrying out the invention.

Figure 2 shows in front elevation a cut glass body available for producing the image and Figure 3 the same in side elevation.

Figures 4, 5 and 6 show diagrammatically different figures formed on the projection screen.

Figure 7 shows a glass cuvet for producing physical or chemical actions for obtaining fanciful pictures.

Figs. 8 and 9 show receptacles provided with rotatable glass objects.

The projection apparatus, Figure 1, consists in the known manner of light source 1, condenser 2, lenses 3 and the casing 4. The glass body 5 shown in two views in Figures 2 and 3 serves as an object to be represented and can be adjusted by a toothed gearing 6 at different distances from the condenser 2 and lenses 3 respectively.

Since only a comparatively thin streak limited or bounded by two facets 7 and 8 is provided between lenses and condenser and within which objects are sharply defined or represented, the body 5, when located in the position as shown, will produce on the screen an image according to Figure 4.

If the body 5 is shifted toward the lenses 3 by the gearing, the figure represented, which is produced by the edges of the glass body, will correspond in succession according to Figures 5 and 6 respectively.

Figure 7 shows a glass cuvet 13 which can be placed in the projection apparatus instead of the body 5. Color-solution phenomena or chemical precipitates 14 are produced in the cuvet 13, which according to the movement of the liquid or according as they fill up in a different manner the streaks between the facets 7 and 8 are represented as sharper or blurred alternating cloud-images of fanciful shape.

Fig. 8 shows a frame 9 in which a glass object 10 is rotatable about a shaft 11, driven by a belt 12, which rotates a pulley 15 fixed to said shaft. Fig. 9 illustrates a frame 9′ in which a number of glass rods 10′ are rotatably mounted. The said rods may be rotated in the same direction or alternately in opposite directions of rotation by a bevel wheel gear 12′, rotated for instance by means of a handle 16. The frames are placed in the projection apparatus instead of the body 5.

In all cases the effect of the projection can be still further increased by producing kaleidoscopic effects by means of mirrors or prisms. All these projections may be employed, by way of covering, together with common steady and moving projections, whereby the variety of effects is still further increased.

We claim:—

1. In an arrangement for producing particular effects during the projections of backgrounds and the like for theatres, exhibitions, advertisements and so forth, consisting in a

projecting apparatus, a projecting object and a projecting screen, the use of a light-permeable, bodylike projecting object of such extent in the direction of the light rays of the projecting apparatus, that according to the position of the projecting object only one layer of the same will be sharply projected while the other parts of the projecting object, further away from the said layer, will be indistinctly projected, and means for moving the projecting object in the direction of the light rays of the projecting apparatus.

2. In an arrangement for producing particular effects during the projections of backgrounds and the like for theatres, exhibitions, advertisements and so forth, consisting in a projecting apparatus, a projecting object and a projecting screen, the use of a light-permeable, bodylike projecting object of such extent in the direction of the light rays of the projecting apparatus, that according to the position of the projecting object only one layer of the same will be sharply projected, while the other parts of the projecting object, further away from the said layer, will be indistinctly projected, and means for moving the projecting object in the direction of the light rays of the projecting apparatus, whereby the projecting object is formed and moved in a cuvette by dissolving of matters or the production of chemical precipitations in liquids.

In testimony whereof we have affixed our signatures.

REMIGIUS GEYLING.
PAUL PLANER.