(No Model.) 2 Sheets—Sheet 1.

S. MACKAYE.

APPARATUS FOR PRODUCING SCENIC EFFECTS.

No. 490,483. Patented Jan. 24, 1893.

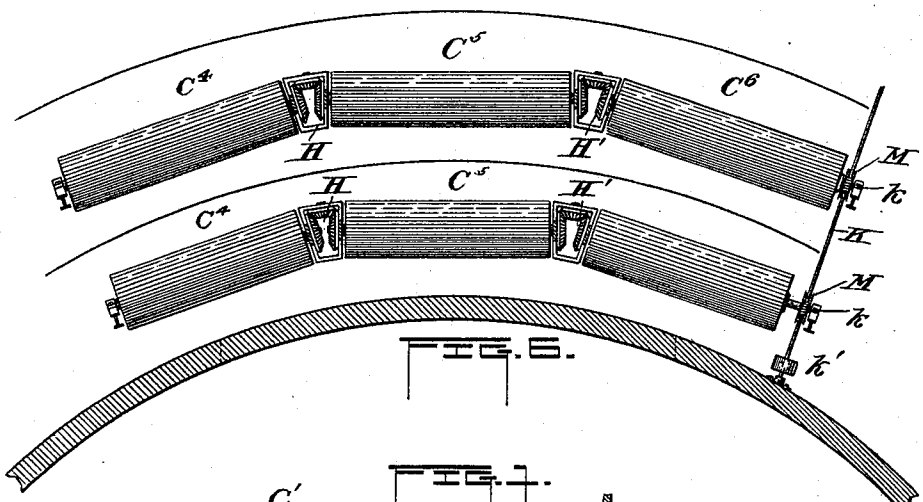

FIG. 6.

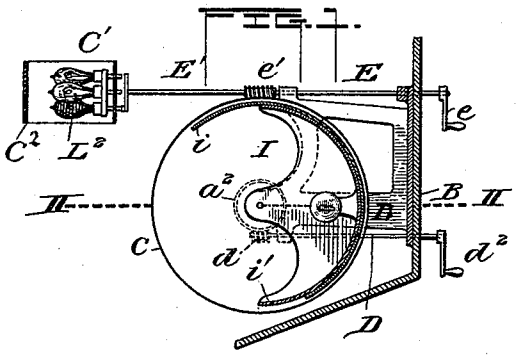

FIG. 1.

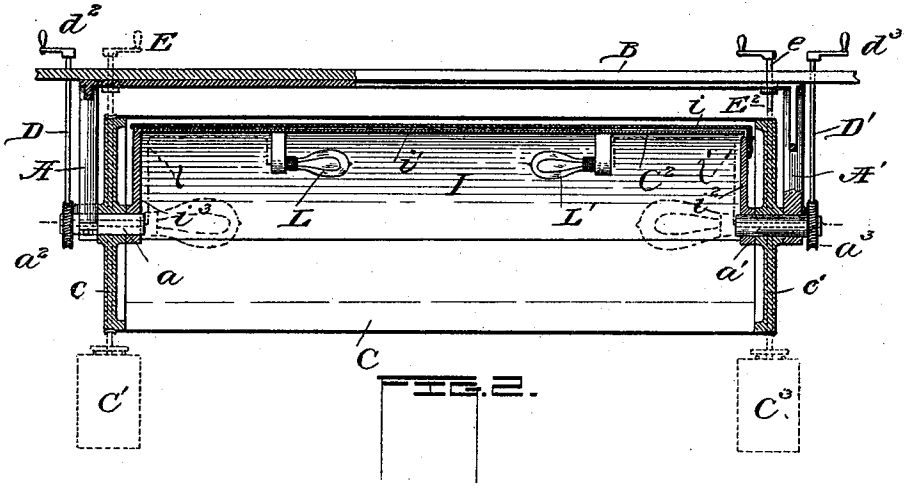

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

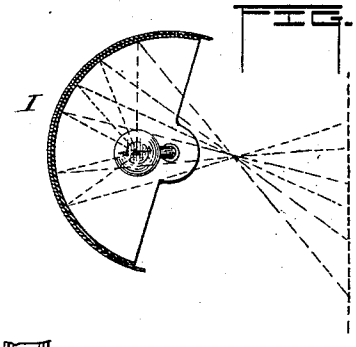


FIG. 4.

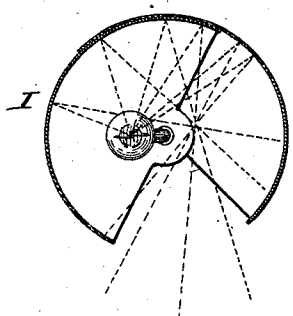


FIG. 7.

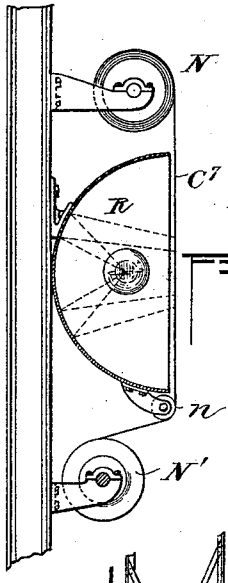


FIG. 8.

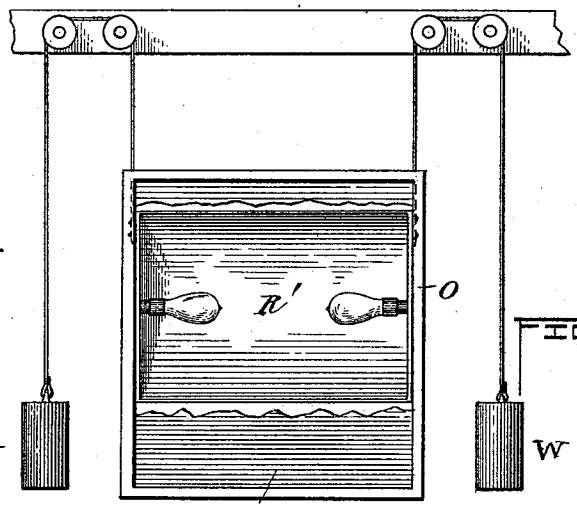


FIG. 5.

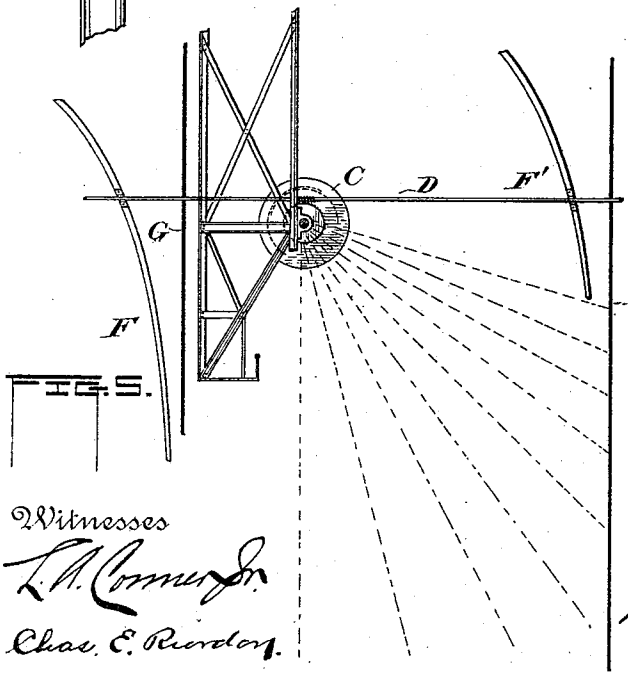
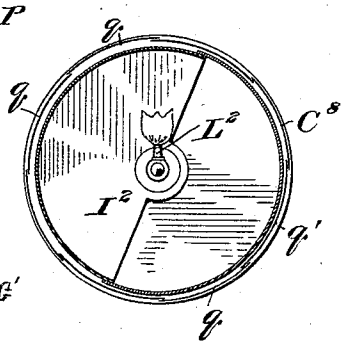


FIG. 9.



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UNITED STATES PATENT OFFICE.

STEELE MACKAYE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE SPECTATORIA COMPANY, OF SAME PLACE.

APPARATUS FOR PRODUCING SCENIC EFFECTS.

SPECIFICATION forming part of Letters Patent No. 490,483, dated January 24, 1893.

Application filed May 25, 1892. Serial No. 434,291. (No model.)

To all whom it may concern:

Be it known that I, STEELE MACKAYE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Producing Scenic Effects; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to devices for illuminating and coloring stage scenery, or producing scenic effects, and the object is to provide means for the improvement of scenic illumination upon the stage and the increase of realism in scenic effects. To this end I have devised improved appliances for imitating the shades and tints of light which color the landscape, from the darkness of night, through dawn, sunrise, early morning, noon, afternoon, evening, sunset, twilight, moonlight into the darkness of midnight again; these appliances permitting the imitation of the tints of the hours to be produced completely, or in part, as desired, and facilitating the passage and blending of the various tints each into the other so as to illustrate the slow progress of the hours throughout the whole day. They also permit the imitation of clouds moving through the sky, and of cloud shadows moving over land and water.

The invention will first be described with reference to the accompanying drawings and then particularly pointed out in the claims at the end of this specification.

Referring to the drawings which form a part of this specification; Figure 1 represents a sectional end view of a device embodying my invention; Fig. 2, is a horizontal section of the same on line II—II of Fig. 1; Figs. 3 and 4 are detail sectional end views of the reflector or "illumiscope" illustrating the same in different positions; Fig. 5 is a fragmentary end view of the illuminating gallery or frame work above the proscenium opening of a theater with my improvements attached; Fig. 6, is a horizontal section illustrating a double series of coloring drums or "colorators" geared together so as to move in unison; Fig. 7 is an end view of a modification of the invention; Fig. 8, is an end view of another modification; and Fig. 9, is a front view of a further modification, part being broken away.

In the preferred form of my invention I propose to employ a rotary drum of any suitable transparent or semi-transparent material, such as paper, glass, celluloid or gelatine with the desired coloring effects painted upon or worked into the same in such manner as to blend the colors and secure the various tints desired in any scene, together with an electric lamp or other suitable source of light properly supported within the drum so that the light may pass through the tinted or variously colored circumference of the drum when rotated, conveying the tint or combination of tints thereon and causing the same to fall upon the drop, sky-foundation, or landscape for the purpose of producing the desired scenic effect. A drum may also be provided with a covering of any suitable transparent or semi-transparent substance, upon which the various tints of the hours in their order of succession, or other scenic effects, may be dyed or painted. I may also employ traveling belts, bands, curtains or slides of suitably colored or tinted transparent or semi-transparent material, interposed between the light and the sky foundation, drop-scene or scenic arrangements upon the stage upon which it is desired to convey the tints or coloring effects.

C in the drawings, denotes a rotary drum or "colorator" which may consist of any suitable material, as above described, and is provided with heads c, c', which are fitted to revolve on trunnions or spindles a, a', journaled in brackets A, A', which may be secured in any suitable manner to the frame work of the building or to a shield B, depending therefrom as clearly shown in Figs. 1 and 5.

I denotes an "illumiscope" or duplex reflector placed within the coloring drum C, and may be composed of two segments i, i', fitted together so as to move one within the other. The segment i, is rigidly secured to the end frame-piece or bracket i^2, which is made fast to the inner end of the trunnion a', and the segment i', is rigidly secured to the opposite trunnion a in a similar manner,

so that the two segments may rotate with the trunnions independently of each other. The inner concave faces of these segments are provided with reflecting surfaces, and to the inner segment may be secured the electric (or other suitable) lamps L, L′, which may be placed in circuit with a dynamo or other generator by passing the wires *l*, *l′* thereof through the hollow trunnions *a*, *a′* and connecting them with the circuit wires in the usual manner.

To provide means for rotating the segments *i*, *i′* of the illumiscope I secure to the outer ends of the trunnions *a*, *a′*, worm wheels a^2, a^3 which engage worms *d*, *d′* on the ends of shafts D, D′, the latter being provided with crank handles d^2, d^3, whereby the segments may be rotated for the purpose of regulating the opening for the passage of light as indicated by the dotted lines in Figs. 3, 4 and 5.

E denotes a shaft having a crank *e* at one end and a worm *e′* thereon which worm may engage a worm gear on the head *c* of the drum C, whereby the drum may be rotated about the lamps at any desired rate of speed so as to gradually change the tints or other effects of illumination in the scene, such effects being caused by the passage of the light from the lamps through the shade, colors or forms which may be placed upon or worked into the transparent surface of the drum. If desired the shaft E may be formed or provided with an extension E′ forming a rotary support for an auxiliary coloring device or drum C′, which may consist of a series of lamps L^2 with variably colored globes, or a lamp or lamps of ordinary construction placed within a coloring drum C^2, and a corresponding auxiliary coloring device C^3, with operating shaft E^2, may be provided at the opposite end of the drum C, as indicated by full and dotted lines in Fig. 2, these auxiliary devices being made removable so that they may be dispensed with when desirable.

F (Fig. 5) denotes a masking border or screen for concealing the machinery in the fly-gallery, and F′ a similar screen in rear thereof.

G, denotes a sky or landscape drop suspended from the fly-gallery in position to be lowered when desired, and G′ a sky or landscape drop lowered ready to receive the coloring effects, clouds or shadows thrown upon it by the colorator.

By rotating the segments *i*, *i′*, of the illumiscope the opening for the passage of light may be enlarged or decreased at will, as indicated by the dotted lines in Figs. 3 and 4, thus controlling the direction, amount, and extension of light that may be desirable for illuminating purposes.

The illumiscope having been properly adjusted, the light from the lamps will be reflected and pass through the shade, colors, or forms which may be placed upon or worked into the transparent or semi-transparent surface of the drum or colorator C, and the latter may be rotated at any desired rate of speed so as to cause the effects upon the sky foundation or landscape or scenic arrangement which is being illuminated to be gradually changed so as to give the appearance of the various effects produced by nature, throughout the day and night, with the ever varying changes of a cloudy day or stormy day or night accompanied by various storm or other effects indicating either foul or fair weather. The device being specially adapted to illuminate and color scenic arrangements imitating nature and to increase realism in such imitations. By properly adjusting the illumiscope the beams of light may be centered on any part of the surface, scenery or painting or spread over the entire surface at will, and the illuminating effect may be increased or diminished in accordance with the wishes of the operator or the requirements of the occasion or use to which the invention may be put.

In Fig. 6 is shown a double series of colorators, C^4, C^5, C^6, which are connected by beveled gearing as at H, H′, so as to cause the several drums to revolve simultaneously and at the same rate of speed. The end drums C^6 are geared to a worm-shaft K, by means of worms *k*, *k*, on said shaft engaging worm wheels M, M, on the drum shafts or spindles. The worm-shaft K is also provided with a pulley *k′*, about which may pass a band or belt leading from an engine or other driving shaft for actuating the drums. In the arrangement shown, the intermediate drums C^5, of the two series, will revolve in an opposite direction to the drums C^4, C^6, and in this case the several drums should be so colored or painted that the tints, shades, or forms thrown upon the sky foundation or other surface by one drum will correspond with the tints and shades thrown by the oppositely revolving drums. This arrangement avoids the necessity of multiplying the gearing, but if desired suitable gears may be provided to cause all the drums to rotate in the same direction.

In the modification shown in Fig. 7, the colorator C^7, may consist of a band or belt arranged to travel in front of a suitable reflector R, the belt being wound upon a roller N, from which it passes over a small roller *n*, to a roller N′, which latter may be provided with a crank handle or pulley for winding the belt thereon, the upper roller being provided with a weight or retractile spring to hold the belt or curtain taut and cause the same to be automatically wound upon said roller after the manner of an ordinary curtain roller when the belt is unwound or released from the roller N′.

In Fig. 8 is shown a colorator consisting of a vertically adjustable frame with a suitably colored transparent or semi-transparent cloth or other covering P, which may be suspended by means of weights W, W, in front of a reflector R′, and by raising and lowering this frame the colored curtain or cloth may be moved so as to gradually change the tints or

other effects of illumination upon the scene, caused by the passage of the light through the shade, colors, or forms placed upon the cloth.

In the modification shown in Fig. 9, the colorator consists of a rotary drum composed of variously colored overlapping layers or thin sheets or sections q, q', of paper or other suitable material through which the rays of light may pass to the surface or painting on which the scenic effect is to be produced, so as to cause the variously colored sections or sheets to pass successively at any desired rate of speed, between the opening of the illumiscope I^2 inclosed therein and the surface to be illuminated, for the purpose of producing the desired tints, shades or other effects upon the surface or painting on which the rays of light may fall.

I preferably employ an illumiscope of the described construction in connection with the colorator, but the two devices may be used independently and are applicable generally for illuminating purposes in theaters, public halls, or other places of amusement, and while I also preferably employ electric lights for illuminating purposes, the apparatus may be used in connection with any suitable source of light, as for instance a gas jet L^2, as shown in Fig. 9.

When the electric lamps are used as shown in Figs. 1 and 2, they may be fastened upon the trunnions connected with the drum C, as indicated in dotted lines, and supported by the brackets A, A', so as to revolve with the drum, in which case the illumiscope must be separated from the lamp supports, and given an independent support, or it may be dispensed with altogether so as to simplify the device, but thereby the illuminating power will be greatly decreased as well as the faculty of controlling the amount of space in or upon the scene upon which the illuminating rays may fall.

The colorator and illumiscope can be placed above the scenes, in front of each, or at the side, as may be desired, and may be worked by hand or machinery; the hand operating shafts shown in Fig. 1 being dispensed with in the latter case and suitable gearing provided, as for instance pulleys on the worm shafts connecting by belts and pulleys with the driven shaft of an engine.

It will be understood of course that various modifications may be made without departing from the spirit of my invention, and hence I do not desire to be limited to the exact construction and arrangement of parts shown and described herein.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. An apparatus for producing scenic effects, comprising a variously colored sheet or drum consisting of a substance through which light may pass, means for causing the passage of rays of light therethrough onto the surface or object to be illuminated, and mechanism for causing the variously colored portions of such substance to pass successively in proximity to the light, substantially as described.

2. An apparatus for producing scenic effects, comprising a variously colored sheet or drum composed of a transparent substance, means for causing the passage of light therethrough onto the surface or scene to be illuminated, and mechanism for causing the variously colored portions of such substance to pass successively in proximity to the light, substantially as described.

3. An apparatus for producing scenic effects, comprising a variously colored sheet or drum composed of a transparent substance, a reflector arranged in proximity thereto so as to cause the rays of light to pass through such substance onto the surface or scene to be illuminated, and means for causing the variously colored portions of such substance to pass successively in front of the reflector, substantially as described.

4. An apparatus for producing scenic effects, comprising a variously colored sheet or drum composed of a transparent substance, a duplex reflector or "illumiscope" arranged in proximity to such substance so as to cause the rays of light to pass therethrough onto the surface or scene to be illuminated, means for passing the variously colored portions of such substance in front of such reflector, and mechanism for adjusting the reflector so as to control the direction, amount, and extension of light that may be thrown upon such surface, substantially as described.

5. In an apparatus for producing scenic effects, the combination of the colorator, the illumiscope, and means substantially as described for causing the variously colored portions of the colorator to pass successively the opening in the illumiscope for the passage of light, substantially as described.

6. An apparatus for producing scenic effects, comprising a rotary drum having upon its periphery a variously colored substance which will permit the passage of light therethrough, a lamp fitted within the drum, and means for rotating the drum so as to cause the light from the lamp to pass successively through the variously colored portions of such substance to the surface on which the rays of light may fall, substantially as described.

7. An apparatus for producing scenic effects, comprising a rotary drum having on its periphery a variously colored substance which will permit the passage of light therethrough, a reflector fitted within the drum, and means for rotating the latter so as to cause the light to pass successively through the variously colored portions of such substance to the surface on which the rays of light may fall, substantially as described.

8. An apparatus for producing scenic effects, comprising a rotary drum whose peripheral surface is composed of variously colored transparent material, an adjustable segmental reflector or illumiscope rotatably fitted

within the drum, means for rotating the latter, and mechanism for adjusting the illumiscope so as to control the amount and extension of light which may pass through such transparent material to the surface to be illuminated, substantially as described.

9. In an apparatus for producing scenic effects, the illumiscope consisting of the independent rotatable segments having concave reflecting surfaces and means for independently rotating the segments, substantially as described.

10. An apparatus for producing scenic effects, comprising a series of rotary drums having peripheral surfaces composed of variously colored transparent material, lamps fixed within said drums, and means for simultaneously rotating the latter so as to cause the light from the lamps to pass successively through the variously colored portions of the transparent material to the surface or scene to be illuminated, substantially as described.

11. In an apparatus for producing scenic effects the combination with the rotatable colorator, of the auxiliary rotatable colorator and means for rotating both colorators, substantially as described.

12. In combination with the rotatable colorator and mechanism for rotating the same, the auxiliary removable colorator and means for rotating the latter simultaneously with the former, substantially as described.

13. In an apparatus for producing scenic effects, the combination with the rotatable colorator, the illumiscope placed therein, means for adjusting the latter so as to control the amount and extension of light which may pass through said colorator, the auxiliary colorators, and mechanism for simultaneously rotating the several colorators, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

STEELE MACKAYE.

Witnesses:
POWEL CROSLEY,
SIDNEY CLARKE WHITE, JR.