O. SPERLING.

ILLUMINATED DISPLAY APPARATUS.

APPLICATION FILED JULY 14, 1919.

1,341,201.

Patented May 25, 1920.

3 SHEETS-SHEET 1.

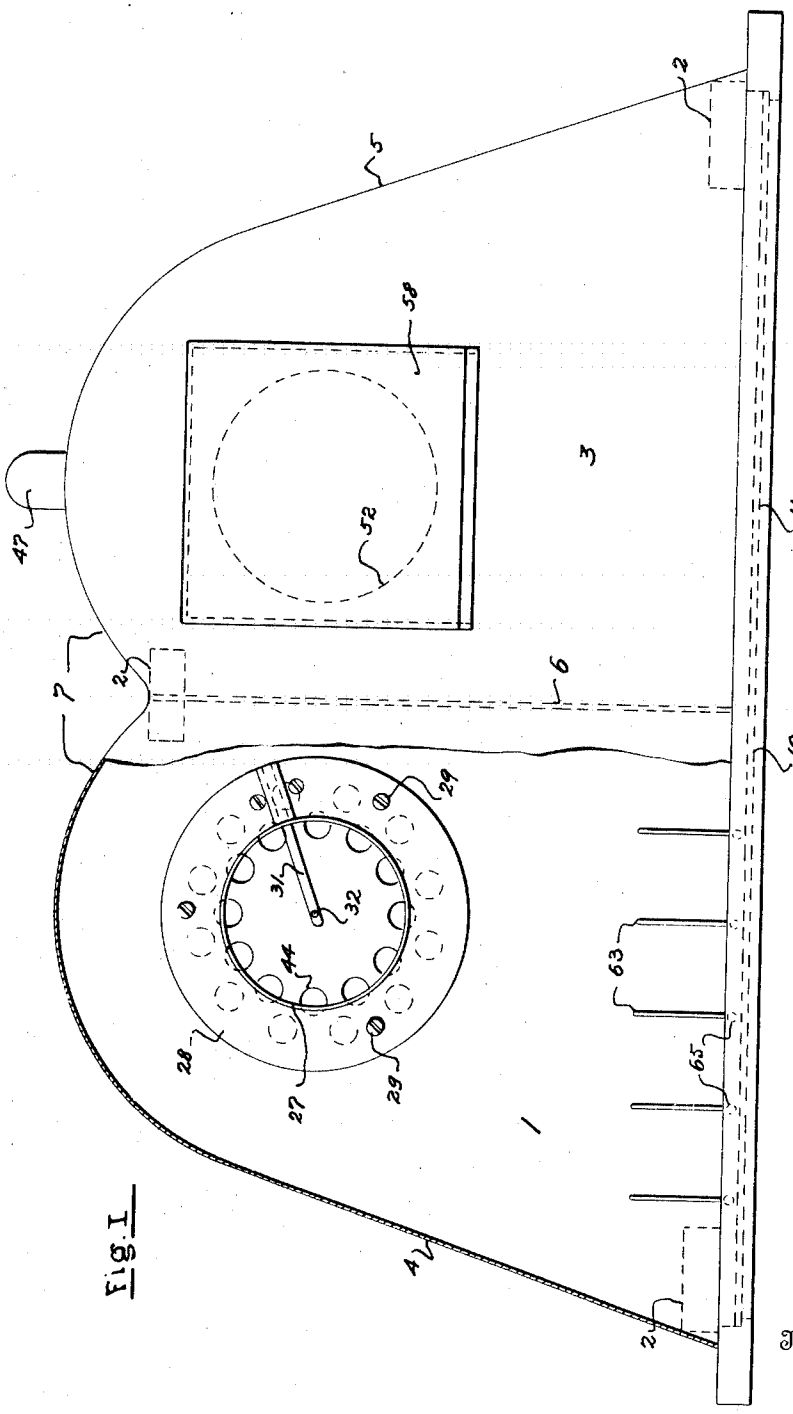


Fig. 1.

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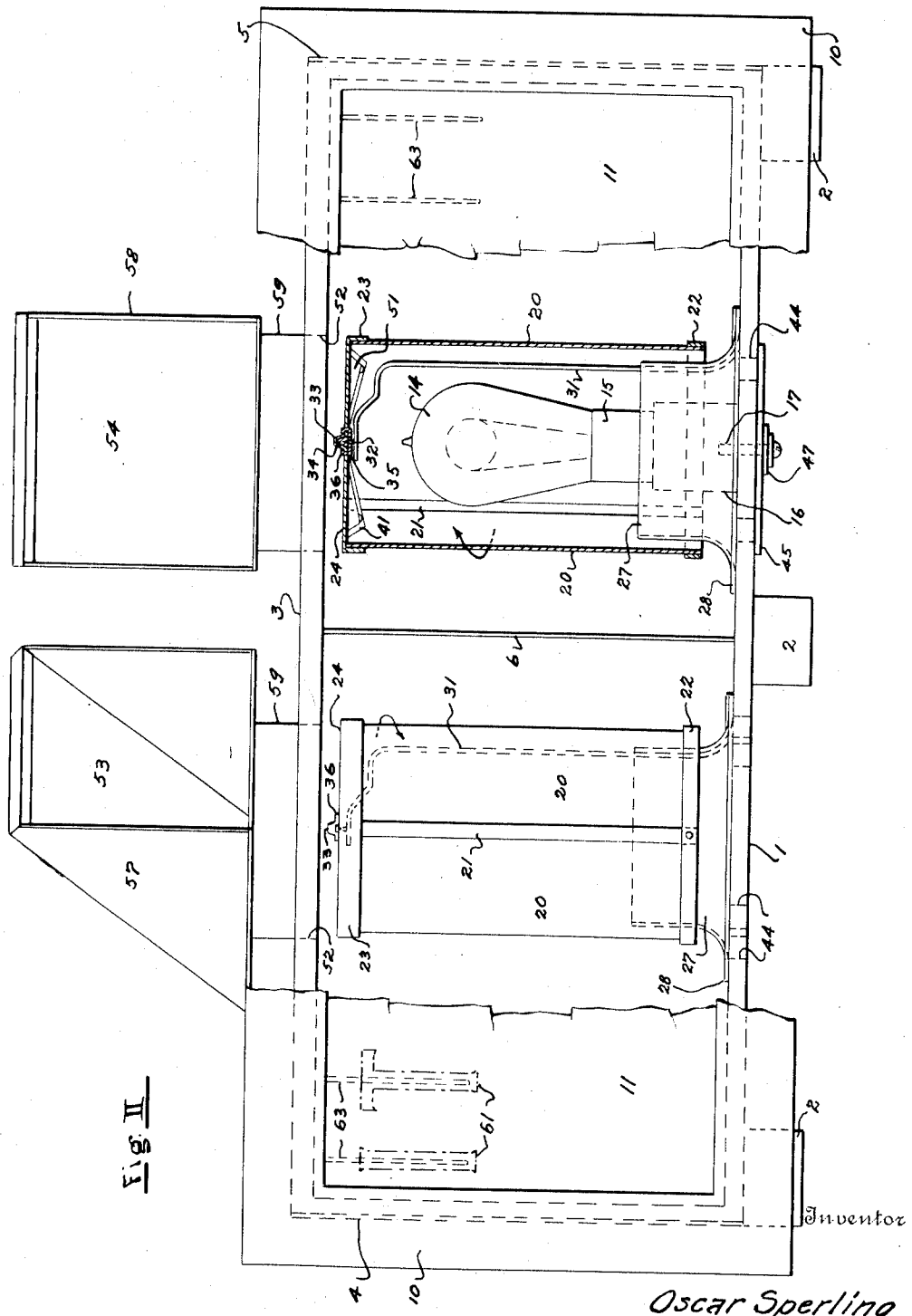


Fig. II

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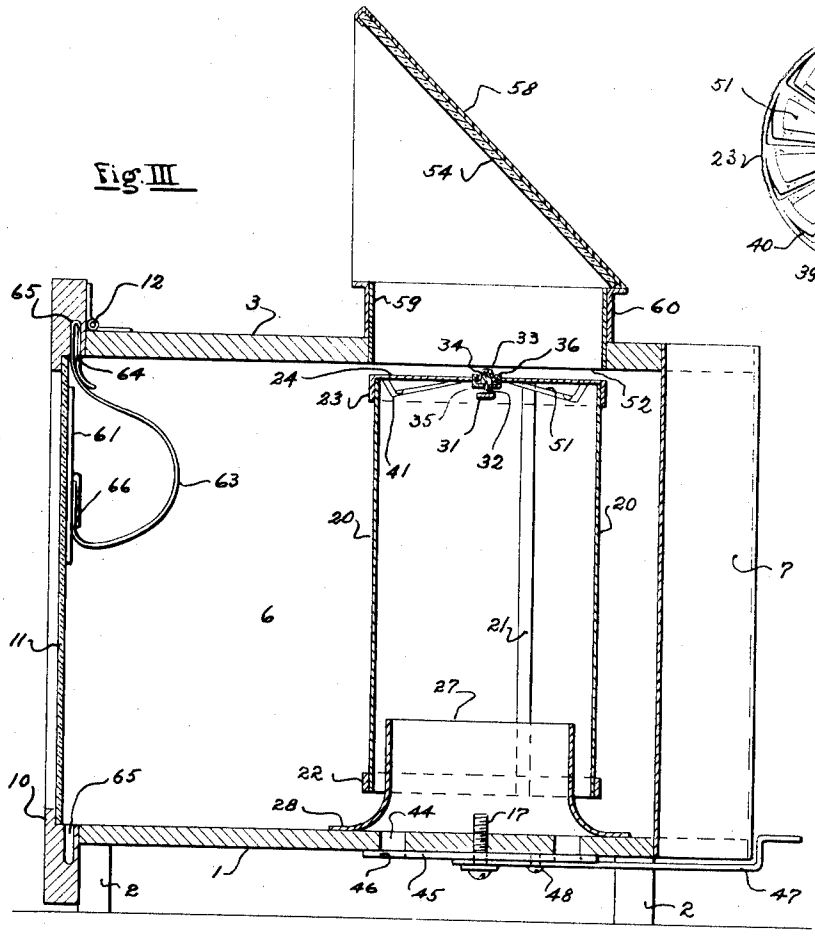
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3 SHEETS-SHEET 3.

Fig. III



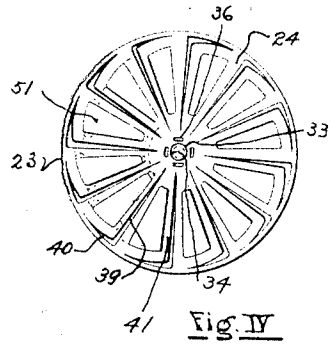


Fig. IV

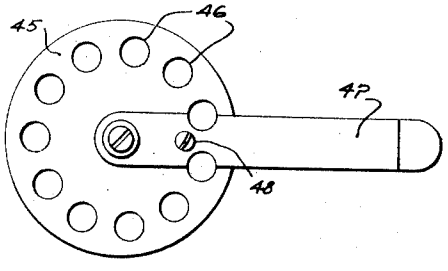
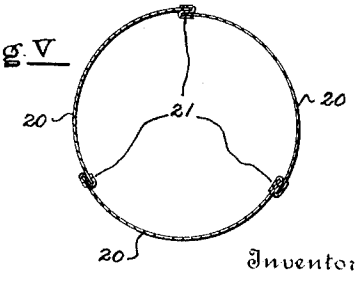


Fig. VI

Fig. V



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UNITED STATES PATENT OFFICE.

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ILLUMINATED DISPLAY APPARATUS.

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Application filed July 14, 1919. Serial No. 310,752.

To all whom it may concern:

Be it known that I, OSCAR SPERLING, a citizen of Sweden, and a resident of the borough of Manhattan, in the county, city, and State of New York, have invented certain new and useful Improvements in Illuminated Display Apparatus, of which the following is a specification.

This invention relates to apparatus for exhibiting or displaying signs, and more particularly to that class of devices wherein lamps are utilized in connection with movable shades, screens, or mantles, to cast rays of light, either white or colored, upon advertising matter or other things exposed to view.

One object of the invention is to produce an improved apparatus of the class referred to, having plural sources of light available both individually and conjointly to illuminate a sign or similar article by means of periodically recurring series of luminiferous waves or undulations of varied hues and differential intensities.

Another object is the production, in an apparatus of the character described, of a natural draft and means for positively controlling it, whereby the heat currents that radiate from the sources of light are adapted to rotate their surrounding mantles at varying velocities, and consequently to enlarge or diminish at option the photosphere of either source.

A further object is to provide an apparatus of the nature set forth capable of projecting images of the rotating mantles, embellished by the changing color effects originating therefrom, in addition to furnishing the light wherewith the sign is illuminated.

Still another object is the provision of an apparatus of the type mentioned, equipped with one or more reflectors designed to project the images aforesaid in adjustable relation to one another, and further admitting of being turned, so as to divert the light in any desired direction to illumine other things than the sign toward which its rays are ordinarily directed.

A still further object is to supply an apparatus of the kind specified, with an assortment of separate signs or changeable characters therefor, which can be readily grouped in accordance with any predetermined arrangement, independently of the light transmitting media and the position thereof relatively to the surface upon which the signs or characters are displayed.

An additional object is to devise an apparatus of the species alluded to, affording a structure composed of but few parts, of simple construction and operation, as well as easily assembled, or taken apart for inspection or repairs, and meanwhile susceptible of low cost of manufacture.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists of the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated on the annexed drawings, wherein like parts are designated by the same reference characters throughout the several views.

A practical embodiment of the invention, hitherto satisfactorily operated, comprises a casing divided into a plurality of compartments normally partitioned off from one another. Each compartment contains a source of light,—conveniently, an electric bulb lamp of the incandescent genus. The lamp in each instance is surrounded by a mantle composed of varicolored segments of transparent material, and the several mantles are adapted to be revolved upon centrally-disposed axes by the heat radiating from their respective lamps. For this purpose, the upper end of each mantle is formed into a turbine-like impeller, with a series of vanes through which the currents of heat are made to pass. A draft is established through the mantle, and a valve is provided to control the same so as either to accelerate or to retard the flow of the heat currents according as to whether a fast or a slow impulse should be imparted to the vanes. Such a valve may be used in connection with any or all of the lamps and mantles, that is wherever deemed expedient. The rays of light passing through the vanes of the impellers are utilized by reflecting them above the apparatus, and thus producing attractive luminous effects in addition to what is projected upon the signs or the constituent parts thereof. The reflective surfaces are located in hoods that provide adequate ventilation for the interior of the entire apparatus, and besides admit

of individual rotation, in such a manner that they can be adjusted in various positions relatively to one another to insure a desirable blending of the rays of light reflected, and furthermore, either one of them may be turned so as to direct a shaft of light, either permanently or temporarily, upon some particular object situated beyond the apparatus, or any part of the apartment where the latter is installed. The signs to be illuminated, in the embodiment of the apparatus under consideration, consist of movable characters detachably held upon a translucent pane of glass, common to the plural compartments above mentioned, by means of resilient holders provided for the several characters individually.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in the one and same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, upon becoming conversant with the details thereof, that the same may be incorporated in several different constructions. The accompanying drawings, therefore, are submitted merely as showing the preferred exemplification of the invention.

In the said drawings,—

Figure I is a top plan view of an apparatus exemplifying the embodiment of the invention above outlined, certain parts being broken or omitted, and others appearing in section;

Fig. II is a front elevation, partly broken and partly in section, of the same form of the apparatus;

Fig. III is a vertical section, taken centrally through one of the said compartments, including a mantle positioned therein and a hood with reflector above, but omitting the lamp pertaining to the mantle;

Fig. IV is a top plan view of the impeller part of the mantle, detached;

Fig. V is a horizontal section across the mantle, showing the approved method of joining the segments thereof together; and

Fig. VI is a detail plan view, showing a plate valve and lever therefor, adapted to control the draft through the mantle, in the manner and for the purpose hereinbefore mentioned.

The improved apparatus, in the form herein exemplified, comprises a casing made with a level floor 1, resting upon supports, 2; a flat top 3 thereabove; and side walls 4 and 5, curved at the rear of the structure, and thence extending obliquely forward in opposite directions. It is understood that these details of construction may vary within wide limits, but preferably and as shown, the casing is divided into a plurality of compartments that are rounded rearward and flare forwardly at the sides, in order that the rays of light impinging upon the inner faces of the casing shall be all reflected toward the front. The casing may be made of sheet-metal, suitably painted to preclude reflection. The compartments are conveniently separated one from another by a partition, as 6, rising from the floor 1 to the top 3, and extending thereacross from the front to the rear, where it intersects incurving portions 7 of the back walls of the adjoining compartments, all as indicated in Figs. I, II, and III.

In front of the said casing is placed a relatively large frame 10, surrounding a pane 11, of ground glass or other translucent material, to which the signs, characters, pictorial representations, or other articles to be exhibited are attached or affixed, in the manner hereinafter described. The frame 10, it will be observed, is common to the two compartments of the casing shown, extending both laterally and in a vertical direction beyond the structural parts previously mentioned. It may be hinged to the casing for instance to the top thereof, as illustrated at 12 in Fig. III.

Within each compartment aforesaid, in proximity to and preferably concentric with the curved rear portion thereof, is placed a lighting element or source of light, which in the present instance is shown as consisting of an incandescent electric lamp, including a bulb 14, with a base 15, entered into a socket 16, on the floor 1 of the casing. The socket-piece may be secured in position by a screw 17, passing upwardly through the floor, from the underside thereof. See Figs. II and III.

Over each lamp is placed a mantle composed of segmental strips 20, of celluloid, mica, gelatin, or other transparent material, preferably of different colors, and held together in cylindrical form, through the instrumentality of stays 21. As detailed in Fig. V, these stays may be S-shaped and arranged to grasp between their convolutions the lapping edges of adjacent sections of the mantle. The opposite extremities of the stays are respectively engaged by a ring 22, and a circular flange 23, projecting downwardly from the mantle top 24.

At the bottom of each mantle is located a flue 27, consisting of a collar or sleeve-like member rising from a basal flange 28, secured to the floor of the casing, for instance, by screws 29. This member forms an inclosure about the lamp socket and extends upwardly for some distance into the lower end of the mantle. It is spaced from both the socket and the mantle, as shown. Further reference to the same will hereinafter be made.

The above-described mantle is pivotally

mounted upon the upper end of a vertically disposed arm 31, extending by the side of and above the lamp 14. The arm 31 is economically made of a single section of wire bent outwardly at the lower end, and curved inwardly at the upper end as represented in Figs. I and II. The lower end of the wire can be stayed, that is, rigidly anchored, by placing it within a crease or keeper struck up from the under side of the flange 28 of the flue 27, before referred to, and clamping the flange thereover when it is fastened to the casing floor. The upper end of the arm carries a needle 32, which constitutes the pivot upon which the mantle is intended to rotate. In order to produce a proper fulcrum, the mantle top 24 is formed with a pocket 33, designed to receive a small bearing 34, of agate or other hard substance, which is held therein by a retaining plate, as 35, underlying the same and having prongs 36, passed through suitable perforations in the mantle top, and clenched upon the latter. A hole is also made through the plate 34, and a suitable cavity likewise provided in the agate to receive the point of the needle 32.

An impeller is formed from the mantle top 24 aforementioned, by slitting it radially and peripherally, as indicated at 39 and 40, in Fig. 4, and bending the material of which the top is composed so as to produce a series of vanes 41, which are positioned for impingement by the heat currents radiating from the lamp located thereunder inside the mantle. It is understood how the ascending currents passing upward between the vanes of the impeller cause it to revolve and set the mantle in motion. The same form of impeller is employed for each mantle, but it is deemed preferable to cut or set the vanes of the different impellers in reverse directions relatively to one another, so that adjoining mantles may be rotated oppositely to each other, as suggested by the arrows in Fig. II.

Apertures 44 are provided in the bottom 1 of the casing, to admit a certain quantity of the external air into each mantle, to promote the ascent of the heat currents from the lamp surrounded thereby. The external air, it will be noted, enters the mantle through the flue 27. The latter, being spaced from both the lamp socket and the lower end of the mantle, not only provides for the entrance of the air below the radiating heat currents, but also affords a clearance for the lower end of the mantle. The apertures 44 need not be in equal number for each flue, and therefore, a single series of such apertures has been shown below one mantle in the drawings, while a double series thereof appears beneath another mantle. The draft through the mantles can thus be varied according to some predetermined arrangement. Moreover, a valve 45 is provided, which may be used to control the supply of air through the apertures of any series, the same consisting of a plate with corresponding perforations 46, rotatably attached to the floor 1 by the before mentioned screw 17. A lever 47, fastened to the valve plate enables it to be set so as to shut off any series of apertures either partly or entirely to suit any exigency. This lever is fulcrumed also on the screw 17 and is secured to one side of the plate by a screw 48, as indicated in Figs. III and VI.

In the vanes of the impellers are made openings of substantially triangular shape, which may be covered with transparent material, designated by the reference numeral 51, in Fig. IV. This material may be the same as that forming the mantle sections, and either similarly or differently colored, as preferred. The mantles capped by these light-transmitting vanes are mounted so as to rotate directly opposite or underneath apertures 52, made in the top 3 of the casing, and reflectors, as 53 and 54, are placed thereover in position to display images of the multicolored vanes as they rotate over their respective lamps. By preference, these reflectors are inclined at such angles as will serve to exhibit the images above the signs that are illuminated by the mantles directly.

The reflectors aforesaid are mounted in hoods 57 and 58, revolubly connected with the top of the casing by means of sleeves 59 extending up from the openings 52 into collars 60 pertaining to the bases of these hoods. By turning either or both of the hoods, it will be understood that the reflectors therein can be adjusted relatively to one another, to produce different effects with the reflected images. Either hood, with its reflector, can also be turned away from the sign front of the apparatus, and a shaft of light directed therefrom toward any particular object, for example, a safe located in the store wherein the apparatus is left overnight. In the latter case, it is deemed best to use impeller vanes covered with white transparent material.

As before stated, the signs shown in the annexed drawings, are composed of separate characters, as indicated by the reference numeral 61, in Figs. II and III. These may be opaque and grouped in a single line or in plural rows or in any preferred order, according to the discretion and judgment of the person using the apparatus. In any event, the several characters are placed on the rear face of the pane of ground glass 11, mounted in the frame 10. Thus located, the selected characters will stand in relief upon the pane 11 illuminated by the rays of light emitted by the lamps and transmitted in colored waves by the rotating mantles.

A convenient means for maintaining the

characters of the sign in the required position as aforesaid, is afforded by a resilient holder 63, consisting of a thin curved wire disposed rearwardly of each character, as seen in Figs. II and III. The upper end of the wire has a backward bend 64, made to enter and resiliently engage a pocket 65, in the upper member of the frame 10, while a similar bend 66, at the lower end of the wire is arranged to press forwardly upon the rear face of the character, and caused to hold it frictionally upon the pane 11.

While a certain preferred embodiment of this device has been shown and described, it will be understood that changes in the form, arrangements, proportions, sizes and details thereof may be made, without departing from the scope of the invention as defined by the appended claims.

Having described my invention what I desire to secure by Letters Patent and claim, is:—

1. An apparatus of the class described, comprising in combination a casing, plural sources of light therein, a display field illuminated from said light sources, varicolored transparent members rotatable around the latter, and an opaque partition dividing said casing so that said members are separated in such a manner that the rays of light passing through them are prevented from interblending while continuous colored waves are thrown dividedly upon said display field.

2. An apparatus of the class described, comprising in combination an inclosure with a plurality of separated compartments in contiguous relation to one another, a display field common to said compartments, an electric lamp operatively positioned in each of said compartments behind said field, and a mantle revoluble about each lamp, said mantle including multicolored transparent sections, the arrangement being such that the several mantles are isolated within their respective compartments, thereby precluding the mingling of the colored luminiferous undulations from the plurality of lamps and directing them instead against the common display field along well defined lines of demarcation.

3. An apparatus of the class described, comprising in combination a divided casing, a plurality of lamps in the divisions thereof, a display field placed at one side of said casing in position to be illuminated conjointly from said lamps, varicolored transparent mantles rotated around the latter by the heat emanating therefrom, and independent means in said divisions controlling different quantities of air passing through the interior of the several mantles to vary their respective speeds of rotation.

4. An apparatus of the class described, comprising in combination a casing, a display field positioned at one side thereof, lamps located in said casing behind said field, varicolored transparent mantles adapted to be revolved about said lamps through the agency of heat currents emitted thereby, and separate means pertaining to said mantles respectively arranged for impingement by said heat currents in opposite directions, said means including sets of vanes reversely inclined in relation to each other.

5. An apparatus of the class described, comprising in combination a casing divided by an opaque partition into separate compartments, a display field placed by one side of the latter, lamps in said compartments arranged to illuminate said field, varicolored transparent members adapted for rotation around said lamps, said members including impeller vanes acted upon by the heat ascending from the lamps, the vanes of the several impellers being set oppositely to impart rotation to the members in reverse directions on the opposite sides of the partition, and inlets conducting variable quantities of air into the members so as to cause them to revolve at different velocities.

6. An apparatus of the class described, comprising in combination a casing, a display field at one side thereof, a lamp in said casing for illuminating said field, a varicolored transparent member rotatable around said lamp, a set of similarly transparent vanes fixed transversely to the upper end of said member actuated by the heat from the lamp, and a reflector capable of throwing the light passing through said vanes in a direction other than the display field.

7. An apparatus of the class described, comprising in combination a casing, a lamp therein capable of emitting light both endwise and sidewise, a rotatable varicolored transparent member over said lamp positioned to transmit the light laterally, a set of vanes disposed in a plane at substantially right angles to that of the member, said vanes having apertures covered with transparent material permitting the light to pass therethrough in an upright direction, a display field by one side of said casing arranged to receive colored light cast thereon from said member, and a reflector serving to project light transmitted by said vanes.

8. An apparatus of the class described, comprising in combination a casing, a lamp therein, a varicolored transparent member rotatable over said lamp so as to transmit the light therefrom both laterally and in an axial direction, a display field by one side of said casing illuminated by colored rays cast laterally from said member, a reflector inclined relatively to one end of the latter in position to throw light pro-

jected axially of the member, a tubular guide extending up from the casing above the end of the member, and a collar engaging said guide and carrying said reflector.

9. An apparatus of the class described, comprising in combination a casing, a lamp therein, a varicolored transparent member revoluble over said lamp, a display field at the front of said casing positioned for illumination by colored rays thrown from the side of said member, a reflector disposed concentrically at an angle to one end of the latter, and means for adjusting said reflector so as to project axial light cast thereon by said end of the member in a desired direction.

10. An apparatus of the class described, comprising in combination a casing, a display field at one side thereof, lamps in said casing behind said field, varicolored transparent mantles rotatable over said lamps, and reflectors angularly disposed with relation to the ends of said mantles and having their centers substantially coaxial therewith, the field being illuminated by colored rays from the mantles emitted laterally thereof, and said reflectors being capable of adjustment relatively to one another so as to project the end rays from the mantles in different positions.

11. An apparatus of the class described, comprising in combination a casing, lamps therein, varicolored transparent mantles rotatable over the latter, a display field placed by one side of said casing in position to be illuminated by colored rays emitted laterally from said mantles, reflectors on the casing arranged to project images of the mantle ends above the plane of said field, and ducts above the ends of the rotary mantles leading the light therefrom to said reflectors while holding them in their respective places over the casing.

12. An apparatus of the class described, comprising in combination a casing, a display field at one side thereof, a lamp in said casing behind said field, a varicolored transparent mantle positioned for rotation over said lamp by heat currents radiating therefrom, and an air conveying element carried by the bottom of the casing so as to enter said mantle to lead the air thereinto in proximity to the lamp, whereby the air is heated so as to increase the rotative power of the mantle.

13. An apparatus of the class described, comprising in combination a casing, a display field located by one side of the latter, a lamp in said casing behind said field, a varicolored transparent mantle rotatable over said lamp through the action of heat emitted thereby, the lower end of said mantle being separated by an intervening space from the bottom of the casing, a flue serving to convey air across said space into the interior of said mantle to increase the rotation thereof, and means for regulating the flow of air through said flue.

14. An apparatus of the class described, comprising in combination a casing, a display field at one side thereof, a lamp in said casing behind said field, a varicolored transparent mantle rotatable over said lamp, said mantle including transparent impeller vanes at the upper end thereof, and a reflector capable of projecting light passing through said transparent vanes upon objects other than the display field, and a flue extending from the bottom of the casing for conducting external air into the mantle in proximity to the lamp therein and thence up between the vanes past said reflector.

15. An apparatus of the class described, comprising in combination a casing, a display field located by one side thereof, a lamp operatively positioned within said casing for the illumination of said field, a varicolored transparent mantle rotatable over said lamp through the medium of the heat generated thereby, a sleeve extending upwardly from an opening in the top of the casing above said mantle, a ventilating hood having a collar at the base thereof taking around said sleeve, and a reflector in said hood inclined to project light from the end of the mantle.

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