

May 5, 1931.

R. M. CRAIG

1,803,598

CHANGEABLE SIGN

Filed March 1, 1930

3 Sheets-Sheet 1

Fig. 1.

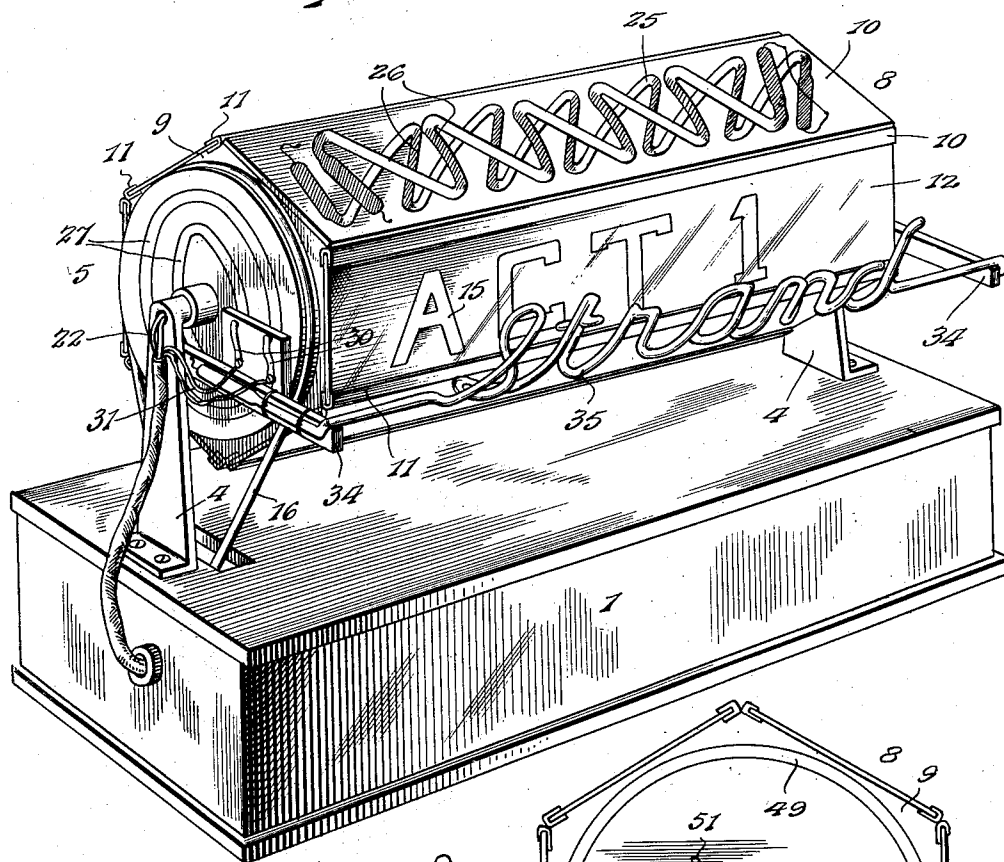


Fig. 4.

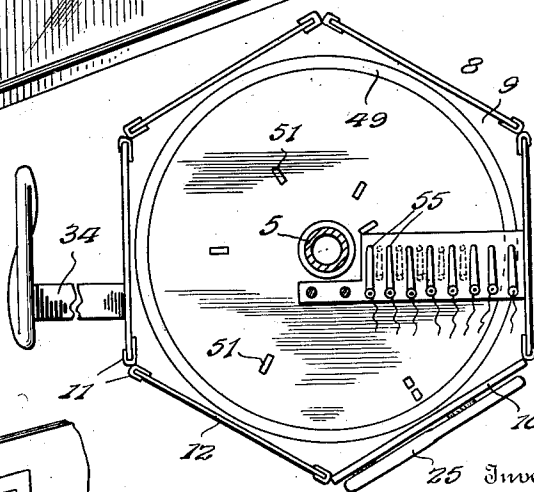
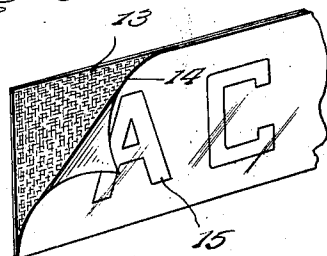


Fig. 5.



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Fig. 2.

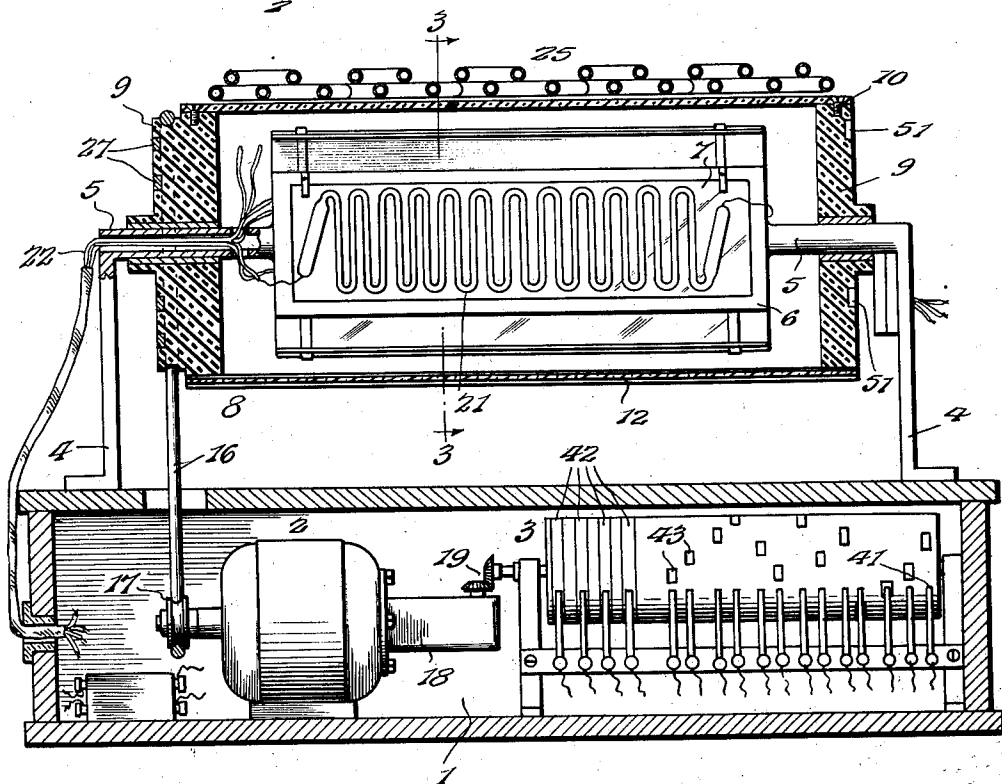


Fig. 6.

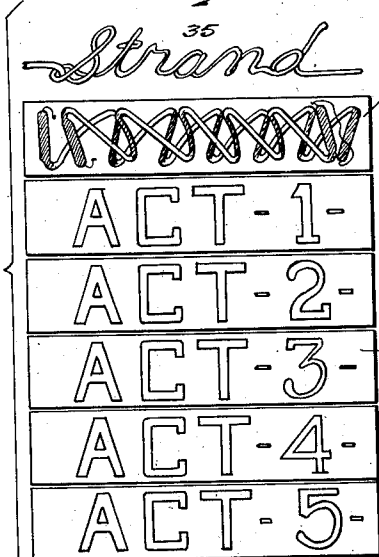
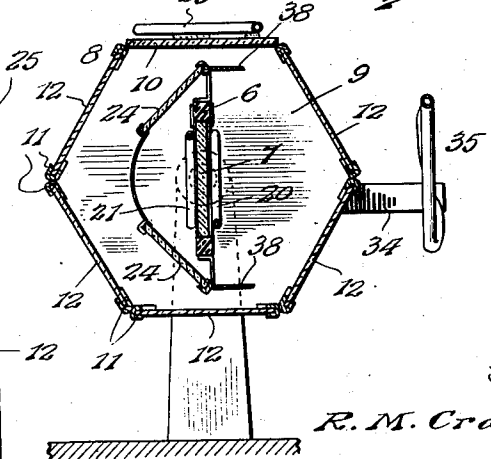


Fig. 3.



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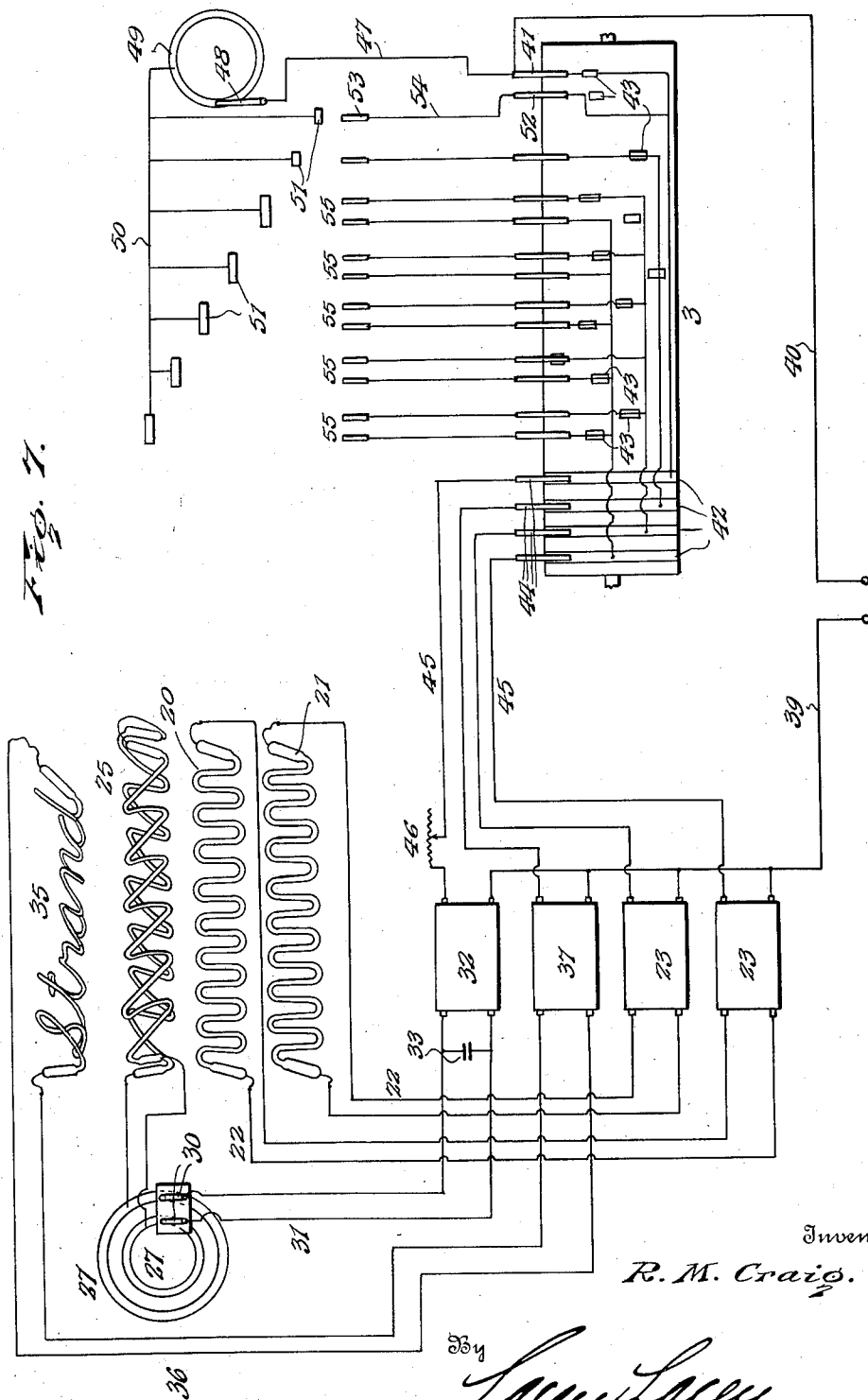
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UNITED STATES PATENT OFFICE

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CHANGEABLE SIGN

Application filed March 1, 1930. Serial No. 432,448.

This invention has for its object the provision of a movable sign of novel construction and which in operation will produce novel and striking effects whereby the attention of passers-by will be attracted. The invention is illustrated in the accompanying drawings and will be hereinafter first fully described and then more particularly defined in the appended claims.

10 In the annexed drawings:

Figure 1 is a perspective view of a display apparatus embodying the present invention,

Fig. 2 is a longitudinal vertical section of the same,

15 Fig. 3 is a transverse section on the line 3-3 of Fig. 2,

Fig. 4 is an end elevation,

Fig. 5 is a detail view of a portion of one form of display member,

20 Fig. 6 is a diagram of the several display elements, and

Fig. 7 is a diagram illustrative of the operation.

In the particular structure illustrated in the drawings, there is employed a box or hollow base 1 in which is mounted a motor 2 and a distributor 3, the motor being controlled from a distant switch in any convenient manner which will be readily understood by those skilled in the electrical art, the sign being intended more particularly for display upon the front of a building and at a height where it will be out of the reach of mischievously inclined individuals. Erected upon the top of the box 1 are standards 4 located adjacent the ends of the box and having their upper ends formed into or rigidly supporting tubes 5 which extend inwardly and to and between the inner ends of which is secured a frame 6 of insulation and which preferably includes a central transparent pane 7. Mounted upon the tubes 5 to rotate about the same is a drum 8 which is preferably of polygonal cross section, the drawings showing a drum having a hexagonal cross sectional contour, although

the drum may be square, triangular or other symmetrical form. The drum is of a skeleton formation including end disks 9 of insulating material, one side plate 10 of opaque material secured upon and extending between said disks, and grooved plates or re-entrant flanges 11 extending longitudinally of the drum at the corners of the same and receiving slides 12, as shown most clearly in Fig. 3. These slides 12 may be stencil plates having any desired announcements cut therein or they may be plates or strips of translucent material having the announcements painted or otherwise displayed thereon in contrasting characters or colors and said stencil plates are light transmitting in character. In Fig. 5, I have illustrated a display element consisting of a sheet of material 13 provided with a pigment color illustrated in the drawings as orange. The sheet 13 may be made of celluloid, gelatine or other suitable material having sufficient durability and capable of permitting the passage of light, and upon this sheet 13 is secured an outer sheet 14 upon which are clear letters 15 or words so that, when light is permitted to pass through the sheet, the letters or words will be wholly legible.

One end disk 9 is extended so as to form a pulley and a belt 16 is trained about the pulley and about a pulley 17 on the motor shaft so that the drum may be rotated. The distributor 3 is also driven from the motor 2 through speed reducing gears, indicated conventionally at 18, and connected through beveled pinions 19 with the shaft of the distributor drum.

Disposed at opposite sides of the transparent plate 7 and supported thereby are luminescent tubes 20 and 21 which are given the form of parallel straight lines connected by alternately opposed bends whereby to constitute a grid and the tubes are given different spectral colors, one being red and the other blue in the selected structure. Elec-

5 tric conductors 22 lead to the bearing tube
 5 at the upper end of the standard 4 and
 then pass through said tube to be connected
 to the terminals of the respective grids, as
 10 will be understood. These conductors, of
 course, are not connected directly with the
 input cables but extend from the secondary
 sides of transformers, indicated convention-
 15 ally at 23 in Fig. 7. Disposed at the back
 of the frame 6 and the grids are mirrors 24
 which are arranged to reflect the light from
 the rear grid so that it will be caused to pass
 through the front of the drum and thereby
 20 add to the unique effects obtained from the
 use of the apparatus. The grids 20 and 21
 are luminescent gas-filled tubes of the type
 popularly called neon tubes. They are of
 clear glass and they are filled with gases
 such that, when illuminated, one tube will
 25 emit a red light and the other a blue light.
 It is the usual practice in neon tube work
 to employ a tube of yellow or uranium glass
 with the same filler which makes a blue light,
 the blue light combining with the yellow of
 30 the glass to make a green light. Uranium
 glass is exceedingly difficult to handle and does
 not satisfactorily withstand weather changes.
 I avoid all the difficulties attendant upon the
 use of such glass by employing an orange
 35 or yellow celluloid or gelatine film on the
 stencil plate and sending light from the blue
 grid therethrough, thereby obtaining a green
 background for the display. In like manner,
 various colors may be displayed and each
 40 stencil or announcement may be shown with a
 distinctive background, a steel blue film light-
 ed from the red grid, for instance, showing
 white.

45 Mounted upon the opaque side 10 of the
 drum is a luminescent tube or a pair of tubes
 25 which are fashioned to form any desired
 outline, the drawings showing a series of
 bends which are extended in opposite direc-
 tions, parts of the tubes being darkened or
 50 rendered opaque, as indicated at 26, so that
 when the drum is rotated at a speed higher
 than the speed of vision the illuminated tube
 will produce the effect of a rotating cork-
 screw or auger. The terminals of the tube
 55 26 are connected with conductor rings 27 set
 in the outer face of an end disk 9 and brushes
 or contact fingers 30 are arranged to bear
 upon said rings so that the tube may be illu-
 minated, wires 31 connecting said brushes
 60 or contact fingers with a transformer 32, as
 indicated in Fig. 7, and a condenser 33 being
 inserted across said wires.

65 Secured upon the standards 4 near the
 upper ends thereof are arms 34 projecting
 forwardly beyond the drum and supported
 by the ends of these arms is a light transmit-
 ting luminescent tube or announcement mem-
 70 ber 35 which is fashioned into a word iden-
 tifying the building upon which or the busi-
 ness in connection with which the apparatus

is displayed. The terminals of this tube 35
 are connected by wires 36 with a transformer
 37, as shown in Fig. 7. It will be noted upon
 reference to Figs. 3 and 4 that the tube 35 is
 70 disposed approximately in the horizontal
 plane of the axis of the drum and alined
 with the grids 20 and 21 so that when the
 tube is not illuminated and the grids are
 illuminated the light from the grids will
 75 pass through the front of the drum and
 through the tube 35 without interference or
 distortion, the tube 35 being of clear glass
 and forming a word in script without any
 opaque spaces. The color of the tube when
 80 illuminated is determined by the gas with
 which it is filled. To prevent vertical di-
 vergence of the rays from the mirrors 24,
 guard plates 38 may be secured to the for-
 ward edges of the mirrors and extend for-
 85 wardly therefrom, as shown in Fig. 3.

The illumination of the tubes is effected
 through primary and secondary circuits, all
 of the electrical connections so far described
 being in the secondary circuits. The primary
 90 circuits include input lines 39 and 40, the
 line 39 being connected to each of the trans-
 formers 23, 32 and 37, as shown in Fig. 7,
 while the line 40 extends to a brush 41 which
 is arranged to cooperate with the drum of the
 95 distributor 3. This drum is a cylinder of in-
 sulation having continuous conductor rings
 42 set in its periphery at one end and having
 contact blocks 43 set in the remaining por-
 tion of its circumferential surface at various
 100 intervals and at various locations to control
 the illumination of the several tubes.
 Brushes 44 bear upon the rings 42 and these
 brushes are connected by conductors 45 with
 the respective transformers, a variable re-
 105 sistance 46 being inserted in the conductor
 45 leading to the transformer 32, as shown in
 Fig. 7. From the brush 41, a wire 47 leads
 to a brush 48 which is arranged to make con-
 tact with a conductor ring 49 mounted on the
 110 end of the drum opposite the end carrying
 the contact rings 27. The ring 49 is con-
 nected through a wire 50 and branches there-
 of with the several contact blocks 51 set in
 the adjacent end of the drum and correspond-
 115 ing in their arrangement to the several tubes
 which are to be selectively illuminated. The
 several contacts 43 upon the distributor drum
 are each electrically connected with one of
 the rings 42. The brush 41 when a contact
 120 43 of the drum rides under its free end will
 establish a circuit through the uppermost
 wire 45 shown in Fig. 7 with the transformer
 32 and the pattern tube 25 will, consequently,
 be illuminated, the illumination being con-
 125 stant when the circuit is through the brush
 41 and the drum. The brush 52 which is next
 to the brush 41 will be electrically connected
 through a contact 43 of the drum with the
 same ring 42 as the brush 41 and the several
 130 contacts are so arranged that when a contact

43 is under the free end of the brush 52 one of the contact blocks 51 in the end of the display drum will be in engagement with a brush 53 mounted adjacent the end of the drum and connected through a wire 54 with the brush 52 so that the circuit will then be up through the wire 47 and brush 48, ring 49, wire 50, block 51, brush 53 and wire 54 to the brush 52 and thence to the transformer, the circuit being closed only momentarily between the points 51 and 53 so that the pattern tube will then be illuminated only once during the rotation of the drum. The tube 35 is illuminated intermittently, the periods being controlled by the block 51 next adjacent the block 51 which has just been more particularly referred to in describing the illumination of the pattern tube 25. The pairs of brushes, indicated at 55 in Fig. 7, each plays a part in the illumination of the grids, these brushes being arranged to be bridged by engagement of the corresponding contact blocks 51. By particularly noting Fig. 7, it will be seen that the brushes of each pair of brushes 55 are connected to different rings 42 and the contacts 43 are so disposed that one brush 55 will effect illumination of the grid 20 while the other brush of the same pair will control illumination of the grid 21 and, therefore, either a red or a blue light will be sent out accordingly. The contact blocks 51 cooperating with the several pairs of brushes 55 are set upon the drum in position corresponding to the positions of the respective display plates 12 so that the grids will be illuminated only when one of said plates is in the display or reading position, indicated in Fig. 1, and the illumination will occur only when the proper display plate is in the reading position. The display apparatus of the present invention is particularly adapted for use upon theaters and other places of amusements and in order that its functions may be clearly understood, I have shown upon the several plates 12 the words and figures indicative of the particular act or performance which at a given time may be upon the stage and the several circuit closing contacts upon the distributor drum and upon the display drum are so arranged that illumination will occur once in each rotation of the display drum and only at such time as the proper display plate happens to be in the reading position. The pattern tube 25 being fixed upon the drum and rotating therewith, the impressions created by the tube in its rotation will be retained by the eye for a period greater than the period during which the tube is actually seen by the eye and this persistency of vision will cause the impressions of the tube to be superimposed upon each other inasmuch as the drum rotates at a speed greater than the speed of vision and many pleasing designs may be seen as a result of this physical characteristic. I have found that if the

full strength of the alternating current on the primary side of the transformer be permitted to flow continuously into the tube 25, the lines will be broad and the effect will be a broad background of color but by interposing the condenser 33 in the circuit I am enabled to obtain very sharply defined lines and by selecting tubes of proper forms the design may be varied infinitely. I have also found that if a resistance be interposed in the primary side of the circuit the points in the rotation of the drum at which the tube appears to be illuminated may be varied and this attribute of the apparatus permits me to vary the effect obtained.

When the stationary tube 35 is illuminated, the pattern tube 25 is also illuminated and will produce a background for the announcement, the grids both being dark. By adjusting the resistance 46, the pattern tube 25 may be caused to illuminate with such frequency that the corkscrew may appear with broken threads or rotate at different speeds or even turn backward.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that I have provided a very compact and simple apparatus by the use of which a very effective and attractive display may be made and an advertising medium of great value will be furnished.

In Fig. 3 of the drawings, I have shown a reflector for throwing the light out one side of the drum, thus making the characters visible or legible on one side of the drum only. By omitting the reflector, however, it is obvious that the signs or characters may be shown on both sides of the drum simultaneously.

Having thus described the invention, I claim:

1. A display apparatus comprising a drum mounted for rotation about its major axis, a luminescent tube disposed in front of the drum in a fixed position, display plates mounted upon the drum, a luminescent tube disposed within the drum and fixedly supported, and means controlled by the rotation of the drum for intermittently illuminating the tubes whereby the announcements upon the display plates may be read behind the fixed tube in front of the drum.

2. A display apparatus comprising a drum mounted for rotation about its major axis, a luminescent tube forming a readable character supported in fixed position in front of the drum, means within the drum for illuminating announcements thereon, and means controlled by rotation of the drum for intermittently illuminating the said tube and the illuminating means within the drum.

3. A display apparatus comprising a drum mounted for continuous rotation about its major axis, display plates carried by the drum, a gas-filled luminescent tube within

the drum to cast light through the display plates, and means controlled by the rotation of the drum for intermittently illuminating the tube.

4. A display apparatus comprising a drum mounted for continuous rotation about its major axis, display plates mounted on the sides of the drum, gas-filled luminescent tubes secured within the drum in fixed position and having contrasting colors, and means controlled by rotation of the drum for illuminating the tubes.

5. A display apparatus comprising a drum mounted for rotation about its major axis, display plates mounted on the drum, a stationary frame within the drum and including a central transparent portion, luminescent tubes of contrasting colors mounted at the opposite sides of said transparent portion whereby to project light through the display plates, and means controlled by rotation of the drum for intermittently and selectively illuminating the tubes.

6. A display apparatus comprising a drum mounted for rotation about its major axis, display plates on the sides of the drum, a fixed frame within the drum including a transparent portion, luminescent tubes of contrasting colors arranged at the opposite sides of said transparent portion, mirrors disposed at the rear of said frame, and means controlled by rotation of the drum to intermittently and selectively illuminate said tubes.

7. A display apparatus comprising a drum mounted for rotation about its major axis and having a polygonal cross section with one opaque side, display plates removably fitted in the remaining sides of the drum, luminescent tubes supported in fixed position within the drum to project light through the display plates at the front of the drum, a luminescent tube secured upon the outer face of the opaque side of the drum and having a design forming shape, and means controlled by the rotation of the drum for selectively illuminating the tubes.

8. A display apparatus comprising a rotatable carrier, a luminescent tube mounted on the carrier and shaped to form a pattern, a stationary luminescent tube mounted in front of the carrier and forming an announcement, and means for illuminating the tubes during rotation of the carrier whereby the pattern tube will produce a background for the announcement tube.

9. A display apparatus comprising a rotatable drum, display plates on the sides of the drum, a luminescent tube within the drum to send light through the display plates, a stationary luminescent tube in front of the drum, and means for intermittently illuminating the tubes, the tube in front of the drum being invisible when the other tube is illuminated.

10. A display apparatus comprising a luminescent announcement element, a luminescent design forming element and means for continuously moving one element relative to the other, the moving element being moved at a speed higher than the speed of vision.

11. A display apparatus comprising a design forming member, a light transmitting announcement member, means for illuminating one member, and means for moving one member relative to the other member, the moving member being moved at a speed higher than the speed of vision.

12. A display apparatus comprising relatively stationary and movable members, a luminescent tube fixedly mounted on the stationary member, a stencil carried by the movable member and through which the light rays pass, a luminescent design element interposed adjacent the stencil, means for illuminating the tube, and means for illuminating the design element.

13. A display apparatus comprising relatively fixed and movable members, a luminescent tube mounted on the stationary member, a stencil carried by the movable member, a luminescent pattern forming tube also carried by the movable member, means for illuminating the tubes, and means whereby the stencil will display a transmitted light announcement at one period and the pattern tube a composite transmitted light design at another.

14. A display apparatus comprising relatively stationary and movable members, a luminescent tube carried by the stationary member, interchangeable light transmitting stencil plates removably mounted on the movable member, means for illuminating the tube, and means for continuously rotating the movable member.

15. A display apparatus comprising a stationary luminescent tube, a member movable around the tube, a light transmitting announcement stencil carried by said movable member, means for illuminating the tube, and a stationary light transmitting announcement member arranged in front of the movable member.

16. A display apparatus comprising a stationary member, a luminescent tube carried by the stationary member, a stationary light transmitting announcement member arranged in front of the luminescent tube, a movable member, and a light transmitting announcement stencil carried by the movable member and visible through the stationary announcement member.

17. A display apparatus comprising a continuously rotating member, a pattern forming luminescent tube carried by said member, a stationary luminescent tube arranged in juxtaposition to the rotating member and fashioned to form announcement characters,

and means for illuminating the tubes either simultaneously or independently.

18. A display apparatus comprising a continuously rotating member, a stationary luminescent tube mounted within said member and having a distinctive spectral color, means for illuminating the tube, and a stencil mounted on the rotating member and provided with a translucent pigment color whereby when the member is rotated the spectral and pigment colors will blend to produce a composite color.

In testimony whereof I affix my signature.
RICHARD M. CRAIG.