Feb. 17, 1931. R. M. CRAIG 1,792,731

DISPLAY APPARATUS

Filed Aug. 7, 1929 3 Sheets-Sheet 1

Fig. 1.

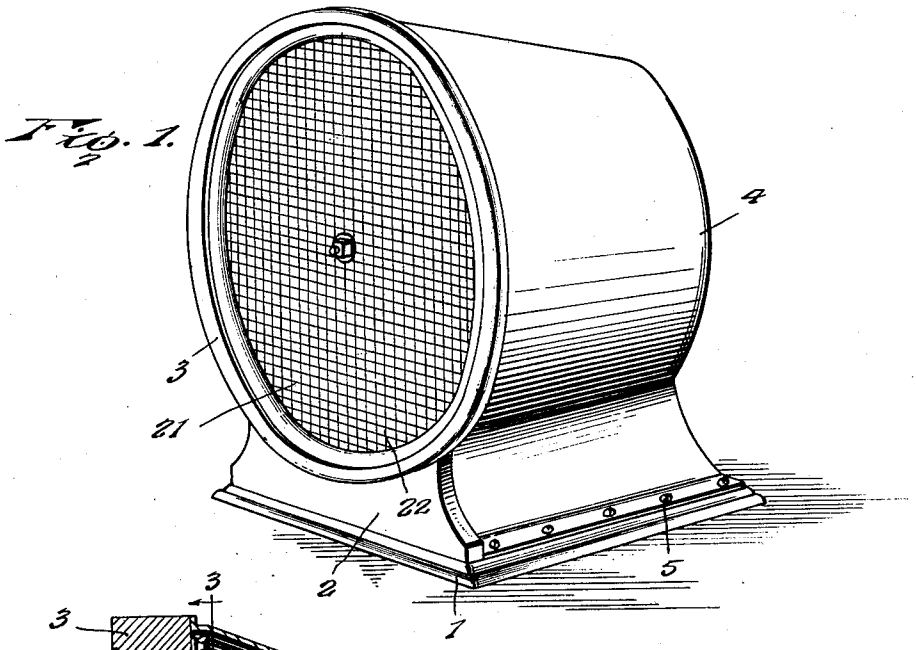
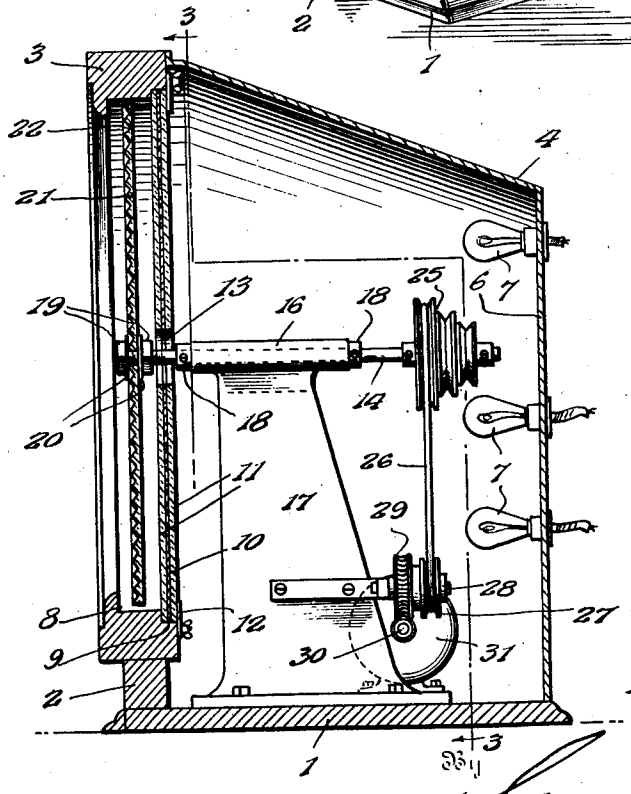


Fig. 2.



Inventor

R. M. Craig.

By Lacey & Lacey, Attorneys

Feb. 17, 1931. R. M. CRAIG 1,792,731

DISPLAY APPARATUS

Filed Aug. 7, 1929 3 Sheets-Sheet 2

Fig. 3.

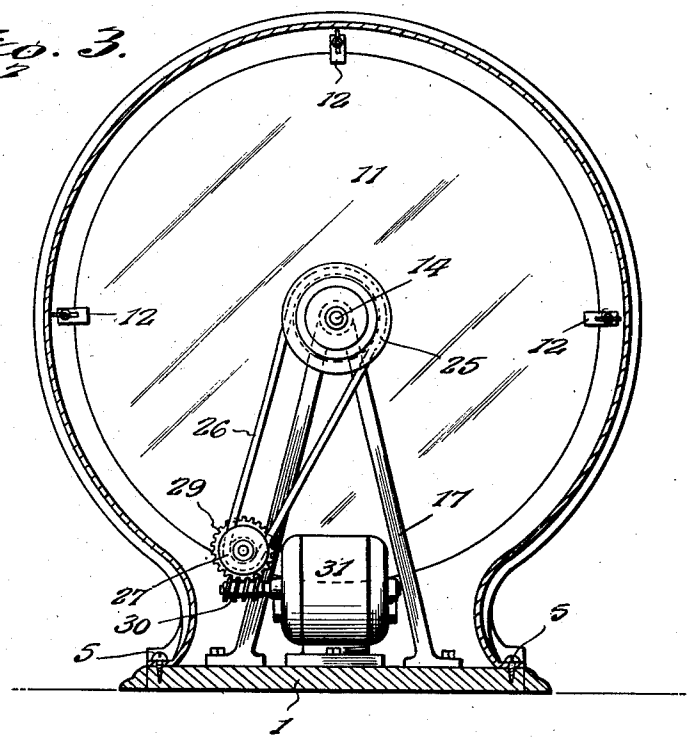


Fig. 4.

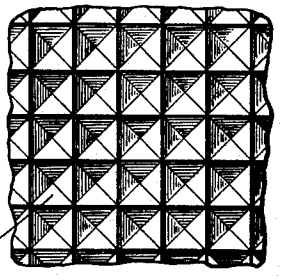


Fig. 5.

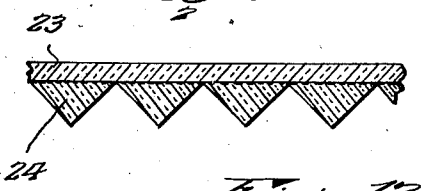


Fig. 12.

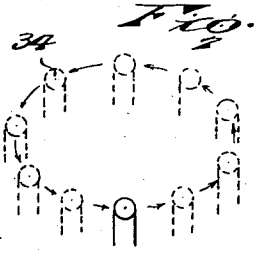


Fig. 11.

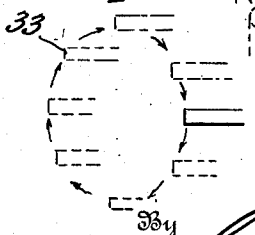
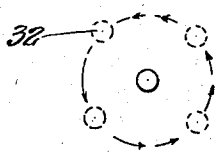


Fig. 10.



Inventor

R. M. Craig.

By

Lacey & Lacey, Attorneys

Feb. 17, 1931. R. M. CRAIG 1,792,731

DISPLAY APPARATUS

Filed Aug. 7, 1929 3 Sheets-Sheet 3

Fig. 7.

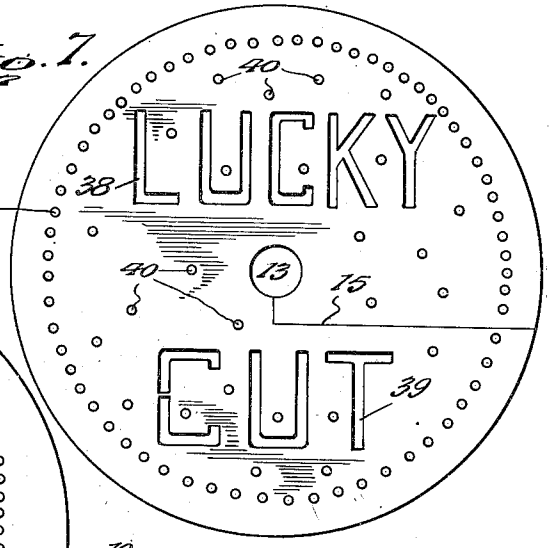


Fig. 6.

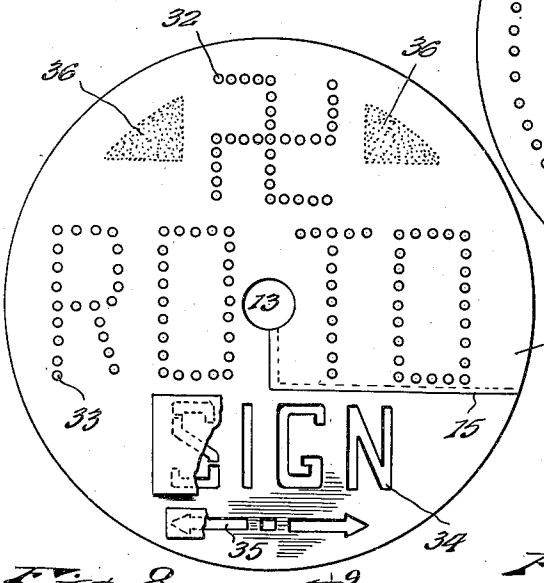


Fig. 8.

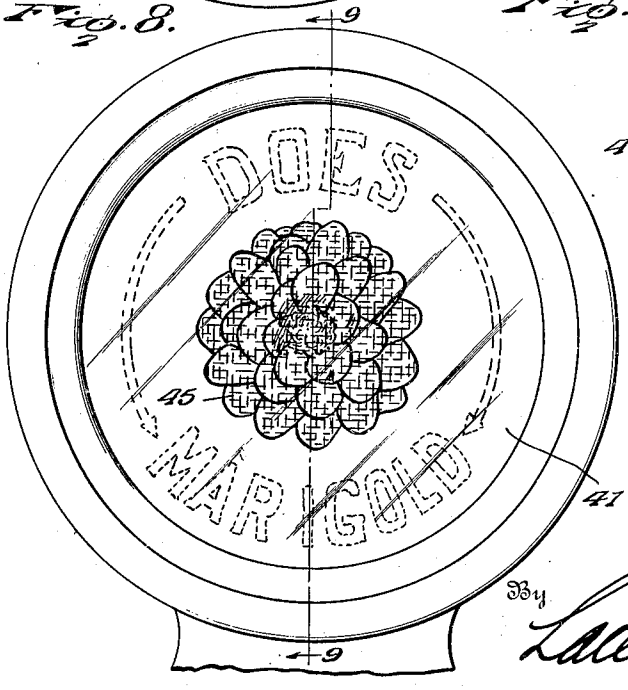
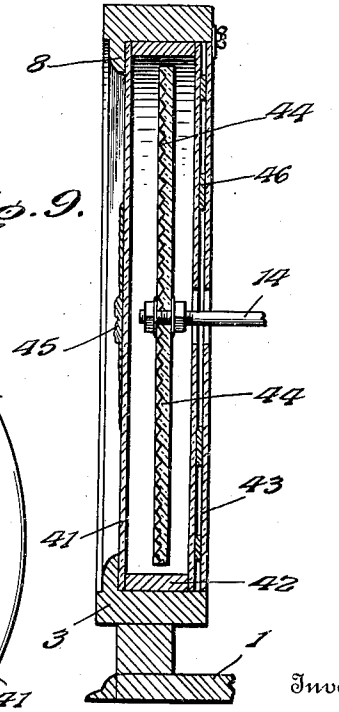


Fig. 9.



Inventor

R. M. Craig.

By Lacey & Lacey,

Attorneys

Patented Feb. 17, 1931 1,792,731

UNITED STATES PATENT OFFICE

RICHARD M. CRAIG, OF SAN ANTONIO, TEXAS

DISPLAY APPARATUS

Application filed August 7, 1929. Serial No. 384,190.

This invention has for its object the provision of a display apparatus which will be composed of few parts and when in use will attract the attention of passers-by because of the unique effects presented. The device is intended more particularly for advertising purposes and provides means whereby an announcement may be displayed in an attractive manner, giving the impression of motion and varying color effects which will impart mystery to the device. The invention provides inexpensive means whereby a sign may be displayed in the apparatus and may be changed as often as desired without any inconvenience or any necessity for completely disassembling the apparatus. The invention is illustrated in the accompanying drawings and will be hereinafter fully described, the novel features being particularly defined in the appended claims.

In the drawings:

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

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

Fig. 3 is a rear elevation with the housing in section on the line 3—3 of Fig. 2,

Fig. 4 is a detail elevation on a larger scale of a portion of a prismatic plate which is employed,

Fig. 5 is an enlarged sectional view showing a modification of the plate,

Figs. 6, 7 and 8 are elevations showing various forms of stencil plates,

Fig. 9 is a section on the line 9—9 of Fig. 8,

Figs. 10, 11 and 12 are diagrams illustrative of certain effects which are obtained by the use of the apparatus.

In carrying out the invention, there is provided a base plate 1 at the front edge of which is secured a rail 2 supporting a circular frame 3 within which are mounted certain parts of the apparatus, as will be presently more particularly described. A housing 4 is also provided and this housing is preferably of sheet metal pressed or bent into the form shown best in Fig. 1 where it is disclosed with a substantially cylindrical upper portion having a front end adapted to fit against the rear side of the circular frame 3 and having its bottom and front end open with its edges detachably secured to the base plate 1 by screws or like fastenings 5. The back wall 6 of the housing is vertical and straight, as shown most clearly in Fig. 2, and upon the same are mounted a plurality of incandescent lamps 7 which may receive current from any convenient source. It will be readily noted that if it be necessary to repair or renew the lamps or for any other reason access to the interior is desired removal of the screws 5 will permit the housing to be lifted from the base plate and the lamps will be withdrawn with the housing.

The circular frame 3 may conveniently be formed of molding providing an annular shoulder 8 near the front edge or side of the frame and a rabbet 9 at the rear side thereof. The display member of the sign consists of a sign sheet or stencil plate of opaque material 10 disposed between two panes of glass or other transparent material 11, the panes 11 and the stencil plate 10 being seated in the rabbet 9 and held therein by turn buttons or the like, indicated at 12. At the center of the panes 11 and stencil plate 10, alined openings 13 are formed therethrough and these openings have a diameter sufficient to accommodate the main shaft 14 of the apparatus and permit the display or sign member to be tilted so that the stencil plate may be changed when desired. As stated, the stencil plate is made from some opaque material and ordinary black paper, such as used by tailors in preparing their patterns, is suitable for the purpose and is generally used. In Figs. 6, 7 and 8 are shown various forms of stencils, and it will be noted particularly upon reference to Figs. 6 and 7 that the stencil plate may have various designs formed

therethrough and is also provided with a slit 15 extending from its margin to the central opening 13 so that the stencil plate may be easily shifted into position about the shaft 14. After the stencil plate is in place, a narrow strip of opaque material is pasted on the back of the plate over the slit 15 so as to prevent the passage of light therethrough. Normally the display member will be seated snugly in the rabbet 9 and will be held therein by the turn buttons 12, as shown in Fig. 2. When, however, it is desired to change the sign, the buttons are swung to one side so that they will clear the edge of the display member and permit the same to be tilted rearwardly, it being understood that the casing or housing 4 is removed prior to the manipulation of the display member. The opening 13 should be of such diameter that the display member may be tilted to an angle such as will enable the upper margin thereof to clear the frame 3 and permit access to the stencil, the panes 11 being supported by the upper edge portion of the central opening resting on the bearing 16 in which the shaft 14 is journaled. The stencil plate may then be easily removed from between the transparent panes and a different stencil plate substituted therefor, whereupon the display member will be restored to its normal position and the casing again secured in place.

Erected upon the base 1 within the casing 4 is a standard 17 having the sleeve or bearing 16 formed on or secured to its upper end and the shaft 14 extends through and rotates in said bearing, stop collars 18 being secured upon the shaft at the ends of the bearing so as to prevent endwise movement of the shaft. The front extremity of the shaft passes centrally through the openings 13 and is threaded to receive the clamping nuts 19 which bear against washers 20 interposed between the nuts and the front and rear faces of a refractive light transmitting plate 21 having prisms on its outer face. The plate 21 may conveniently be pressed glass having prismatic indentations 22 on one face and such structure will be employed in small signs. In the case of large outdoor signs, however, it is desirable to have larger prisms and in such apparatus I find it advantageous to employ a sheet 23 of plain clear glass and secure upon the outer face of the same pyramidal blocks 24, also of clear glass with their bases touching, as shown in Fig. 5, transparent cement being used to effect the joinder of the pyramids and the plate 23.

Upon the inner or rear end of the shaft 14 is secured a cone pulley 25 and a belt 26 trained about said pulley is also trained about a pulley 27 secured upon a shaft 28 carrying a worm gear 29 which meshes with a worm 30 formed on the shaft of an electric motor 31 which is mounted in any convenient manner on the base 1. The cone pulley 25 and the gearing members 27 and 29 are constructed of some durable acid-resisting material whereby a quiet running apparatus will be obtained, and to facilitate the handling of the parts the pulley 27 and the worm gear 29 are preferably formed as an integral structure. In order to obtain any desired speed, the cone pulley is shifted on the shaft 14 and the belt 26 is engaged over one or another section or member of said cone pulley as may be found most desirable under any given circumstances. I have found that generally the best effects are attained in the sign when the shaft 14 makes from twenty to twenty-six revolutions a minute. It will be noted that, as shown in Fig. 2, the prismatic plate 21 is disposed in front of the display member and the diameter of this plate should be such that its margin will be obstructed by the shouldered portion 8 of the circular frame, although the edge of the prismatic plate should be out of contact with the inner circumference of said frame. By adjusting the plate longitudinally of the shaft 14, it may be set closer to or farther from the display member and this will have the effect of magnifying the characters or announcements cut in the stencil plate according to the distance between the prismatic plate and the stencil, provided, of course, the plate is not shifted so far from the display member as to be out of focus. If the prismatic plate be shifted beyond the focal range, the display will be blurred so that it cannot be read and the value of the device as a sign will be lost.

The announcement to be displayed is formed by cutting openings through the stencil plate, and in Fig. 6, there is shown a stencil in which perforations 32 are arranged through the upper portion of the same to form a swastika, while across the horizontal diameter of the stencil other perforations 33 are arranged to form letters, the letters selected for illustrative purposes in this figure being "Roto". Below the word "Roto" in the lower portion of the stencil plate slots or openings are cut to form letters or other characters, the drawings showing the word "Sign" at 34 and below the same the representation of spear heads or arrows 35. In the upper portion of the stencil plate at the opposite sides of the swastika are areas 36 through which minute openings, such as pin pricks, are formed and in the use of the sign these areas will produce a cloud-like effect.

In use, the lamps 7 are illuminated and, obviously, the light from these lamps will pass through the openings formed through the stencil plate and then pass to and through the prismatic plate 21. The prismatic plate being secured firmly upon the shaft 14 will be rotated with the shaft and the light passing through the plate will be refracted and will create a sense of motion in the display

which will be mystifying to the beholder. The characters formed in the stencil plate will remain distinct so that they may be read but at the same time there will be an impression of the component parts of each design moving relative to the other parts. When the prismatic plate is rotated, the refraction of the light rays by the facets of said plate will appear to multiply the number of openings or perforations in the stencil sheet and give the effect of five circles or other figures for each perforation which appears in the actual design, the central circle or opening being the view of the actual opening existing in the stencil plate while the other four circles or figures will be images of the central figure arranged equi-distant from each other and from the central figure, and these images of the central figure will appear to be rotating about the central figure. In practice, I have covered the openings forming the swastika in Fig. 6 with white tissue paper and covered the openings forming the word "Roto" with clear gelatine, while the openings 34 and 35 have been left uncovered and also have been covered with clear gelatine. The areas 36 were covered with pale blue tissue paper so that when the device was in use these areas gave the effect of clouds forming a background or field for the other parts of the announcements. When the prismatic plate or disk is rotated at the proper speed in front of the described stencil plate, the openings or perforations of the word "Roto" are multiplied five times just as the openings or perforations forming the swastika are multiplied and the images form a circle about the central figure and rotate about it. The openings or images of the swastika appear to rotate in the same plane as the prismatic plate or disk is rotated while the openings forming the word "Roto" appear to rotate in a vertical plane at a right angle to the vertical plane in which the prismatic disk is rotated, as indicated in Fig. 11, while the larger openings 34 and 35 appear to be rotating in a horizontal plane, as indicated in Fig. 12.

In Fig. 7, the stencil plate is shown as having a circular row of perforations 37 near its edge and having slots or elongated openings cut through its upper and lower portions to form the words "Lucky cut", as shown at 38 and 39, while at irregular intervals over the remaining area of the stencil plate openings or perforations 40 are formed therethrough. In this design the border perforations 37 are preferably covered with orange tissue paper, while the words "Lucky cut" are covered with orange tinted gelatine so that when the sign is in use it resembles neon lights. The scattered openings 40 are preferably covered with blue tissue paper and when the device is in use the letters appear to rotate in one plane on a field of blue stars which are all rotating in a different plane. The perforations 37 forming the border are cut rather close together and when the sign is illuminated and the prismatic plate rotating, there seem to be three circles of border perforations, the openings in each circle overlapping, and the innermost circle appears to be rotating in one direction while the outermost circle appears to be rotating in the opposite direction.

In the arrangement shown in Figs. 8 and 9, a pane of clear glass 41 is fitted in the frame 3 immediately against the shoulder 8 thereof and a filler ring 42 is disposed between the margin of said plate or pane and the display member shown at 43. A prismatic disk 44 is the same in all respects as the prismatic disk 21 and is mounted and operated in the same manner. In this embodiment of the invention, a design, such as the rosette shown at 45, may be painted in transparent colors upon the outer face of the pane 41 at the center of the same and the stencil plate 46 will have a central opening of such diameter that it will not interrupt the passage of light to and through the rosette. In the outer portion of the stencil plate, however, are cut openings which may be more or less related in meaning to the central design, the characters chosen for illustration being the words "Does marigold". At the sides of the design appear arrows. In this arrangement, the central figure or flower appears to be stationary while the words seem to have the same motion that was observed with the characters shown in the previously described forms.

Instead of using clear lamp bulbs, colored lights may be used and these colored lights may be equipped with flasher buttons so that the color effects of the sign will be increased. A projecting lens may be arranged in front of the sign and the image projected on a large surface in which case the stencil plate would be put in the display member upside down.

It will be seen at once that the apparatus is exceedingly simple and is not apt to get out of order. The effects produced by the use of the device are such that the uninformed observer imagines that there must be a very complicated mechanism to obtain so much apparent action. By adjusting the prism to vary the distance between it and the display member, the images of the openings in the stencil plate will be made to appear different distances apart, the spaces between the images and the diameter of the circle followed by them increasing as the prism is moved away from the display member.

Having thus described the invention, I claim:

1. An apparatus for the purpose set forth comprising a stationary display member having openings therein, a prismatic member arranged in front of the display member, means for projecting light through the openings in

the display member and the prismatic member, and means for rotating the prismatic member, the relative size of the openings with respect to the prisms being such as to produce the effect of motion.

2. Apparatus for the purpose set forth comprising a stencil, a prismatic transparent plate in front of the stencil, means for rotating the prismatic plate, and means for projecting light through the stencil to the prismatic plate while the latter is rotating.

3. Apparatus for the purpose set forth comprising a display member consisting of transparent panes and a stencil plate held by and between said panes, a prismatic disk in front of the display member, means for projecting light through the display member to the prismatic disk, means for rotating the prismatic disk, and means for adjusting the disk with respect to the display member.

4. A display apparatus comprising a frame, a housing at the rear of the frame, a stationary display member mounted in the frame and provided with openings, illuminating means within the housing, a prismatic disk disposed within the frame in front of the display member, and means for rotating the prismatic disk, the relative size of the openings with respect to the prisms of the disk being such as to produce the effect of motion.

5. A display apparatus comprising a support including a frame, a housing at the rear of the frame, lamps carried by the housing, a display member held stationary in the frame and provided with openings, a prismatic disk arranged within the frame in front of the display member, means for rotating the prismatic disk including a shaft and a motor geared thereto and located within the housing, the shaft extending centrally through the display member, the relative size of the openings with respect to the prisms of the disk being such as to produce the effect of motion.

6. A display apparatus comprising a circular frame, a display member seated in the rear side of said frame and including a stencil plate, said display member having a central opening of relatively large diameter therethrough, means on the frame for retaining the display member in place, a shaft passing through the central opening of the display member, a housing at the rear side of the frame enclosing said shaft, a prismatic disk secured on the front end of the shaft in advance of the display member, and illuminating means on the housing whereby to project light through the display member to the prismatic disk while the latter is rotating.

7. A display apparatus comprising a frame, a display member seated in the frame and provided with openings, a prismatic member arranged in front of the display member, means for rotating the prismatic member, means for projecting light rays through the openings in the display member and prismatic member while the latter is rotating, and means for adjusting the prismatic member towards or away from the display member, the relative size of the openings with respect to the prisms being such as to produce the effect of motion.

8. A display apparatus comprising a display member having openings therein, a refractive light transmitting member arranged in front of the display member and provided with pyramidal depressions defining surface facets, means for rotating the light transmitting member, means for projecting light through the openings in the display member and light transmitting member while the latter is rotating, and means for adjusting said light transmitting member towards or from the display member, the relative size of the openings with respect to the facets being such as to produce the effect of motion.

9. A display apparatus comprising an opaque sign sheet having perforations therein and forming characters, a refractive light transmitting plate arranged in front of the sign sheet and having one face thereof provided with pyramidal shaped prisms, means for rotating the plate, means for projecting light through the perforations in the sign sheet and said plate while the latter is rotating and means for adjusting said plate toward and away from the sign sheet.

10. A display apparatus comprising a frame, a housing at the rear of the frame, a shaft mounted for rotating in the housing, a perforated sign sheet disposed within the housing and having an opening therein to accommodate the shaft, said sign sheet having an incision formed therein and extending from the shaft receiving opening to the outer margin of the sheet, a prismatic plate secured to and mounted for rotation with the shaft, means for projecting light through the sign sheet to the prismatic plate, and means for rotating said prismatic plate.

11. A display apparatus comprising a frame, a housing secured to the frame, a standard arranged within the housing and provided with a bearing, a shaft journaled in said bearing, a plurality of cone pulleys slidably mounted on one end of the shaft, a prismatic plate secured to the other end of the shaft, a sign sheet arranged at the rear of the prismatic plate and having an opening therein to accommodate the shaft, a motor, means for transmitting motion from the motor to either of the pulleys, and electric lights carried by the housing for projecting light through the sign sheet to the prismatic plate.

12. A display apparatus comprising a frame, an opaque sign sheet housed within the frame and having perforations therein and forming display characters, a prismatic plate mounted for rotation in front of the sign sheet, means for projecting light through

the perforations in the sign sheet to the prismatic plate, and means for rotating the prismatic plate whereby the perforations forming certain of the display characters will appear to revolve.

13. A display apparatus comprising a frame, a stationary opaque sign sheet arranged within the frame and having perforations therein forming characters to be displayed, transparent material covering certain of the perforations in the sign sheet, translucent material covering other of said perforations, a prismatic plate arranged in front of the sign sheet, means for rotating the prismatic plate, and means for projecting light through the perforations to the prismatic plate.

14. A display apparatus including a frame, an opaque sign sheet having openings therein forming display characters, a transparent plate arranged in front of the sign sheet and having a design painted thereon in a transparent color, a prismatic plate mounted for rotation between the transparent plate and sign sheet, means for rotating the prismatic plate, and means for projecting light through the sign sheet, prismatic plate and transparent plate.

15. A display apparatus including a frame having a rabbeted portion, a housing detachably secured to the frame, transparent plates seated in said rabbeted portion, a perforated sign sheet disposed between said transparent plates, means carried by the frame and engaging one of said transparent plates for detachably securing said sign sheet and transparent plates in the rabbeted portion of the frame, a prismatic plate arranged in front of the transparent plates, means for rotating the prismatic plates, and means for projecting light through the sign sheet to the prismatic plate.

16. A display apparatus comprising a frame, a standard arranged within the frame, a housing extending over the standard, a shaft journaled in the standard and having one end thereof threaded, pulleys secured to the other end of the shaft, a motor, an opaque sign sheet having an opening to receive the shaft and provided with perforations forming display characters, means for detachably securing the sign sheet to the frame, a prismatic plate secured to the threaded end of the shaft, nuts engaging the threaded end of the shaft and bearing against opposite sides of the prismatic plate for adjusting said plate toward or from the sign sheet, a motor, means for transmitting motion from the motor to said pulleys, and electric lights disposed within the housing for projecting light through the sign sheet to the prismatic plate.

17. A display apparatus comprising a sign sheet having perforations therein and forming display characters, a prismatic plate arranged in front of the sign sheet, means for projecting light through the sign sheet to the prismatic plate, and means for rotating the prismatic plate while the sign sheet remains stationary whereby the refraction of the light rays by the prismatic plate will cause the actual number of perforations in the sign sheet to appear multiplied and move relative to each other.

In testimony whereof I affix my signature.

RICHARD M. CRAIG.