April 18, 1944. W. F. O'GORMAN 2,346,699

MOVING SIGN

Filed Sept. 14, 1940 3 Sheets-Sheet 1

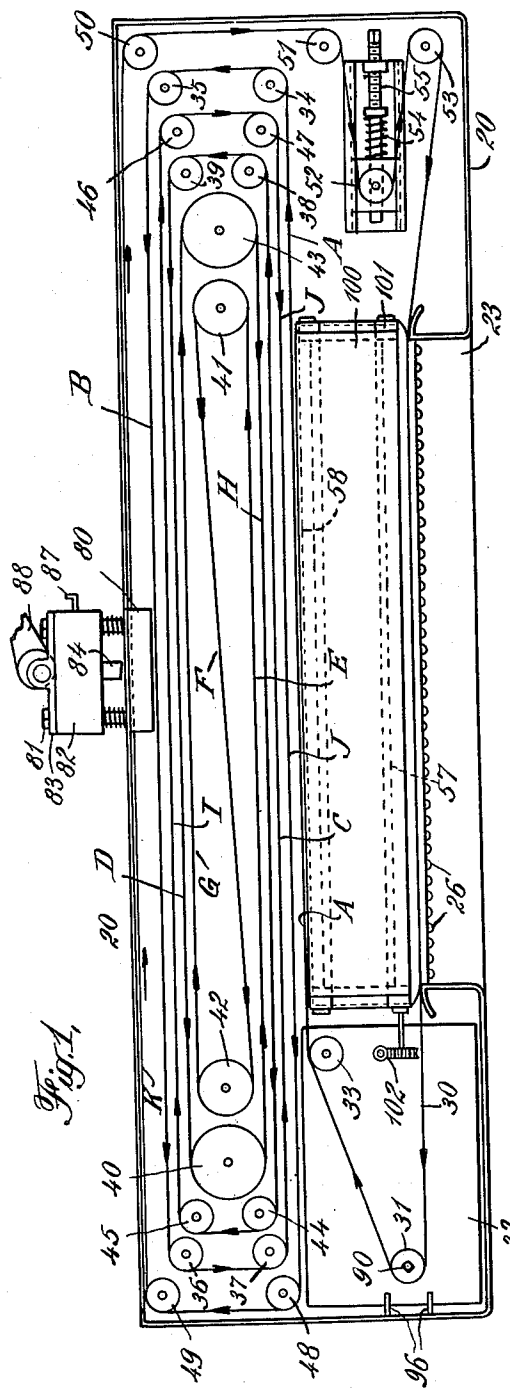


Fig. 1.

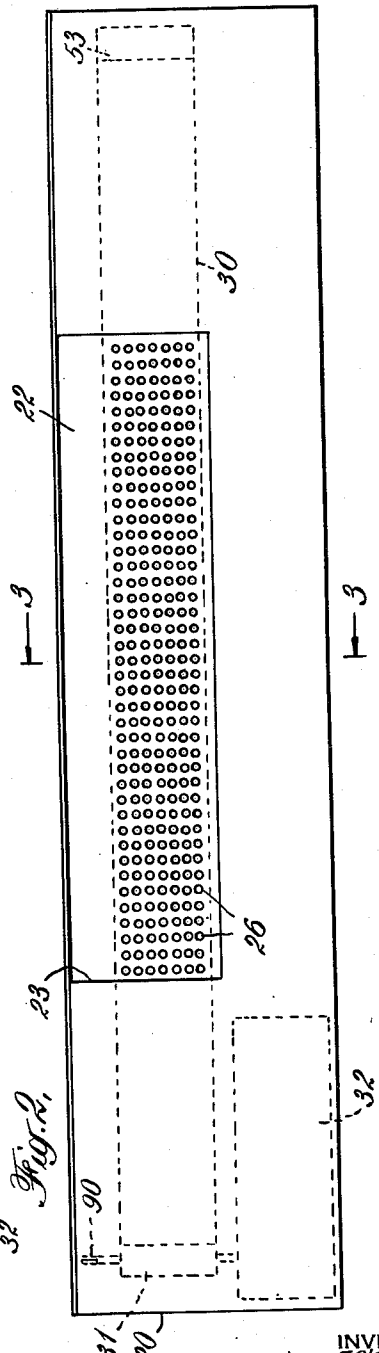


Fig. 2.

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April 18, 1944. W. F. O'GORMAN 2,346,699

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Filed Sept. 14, 1940 3 Sheets-Sheet 2

Fig. 3.

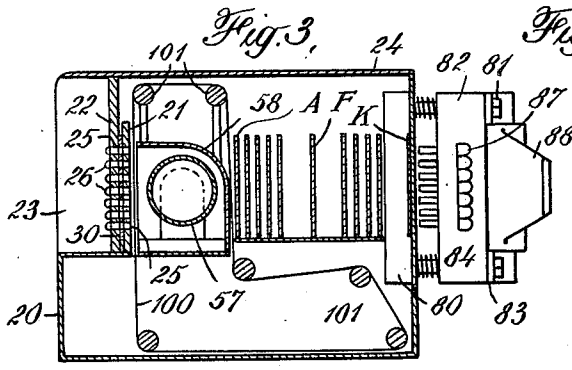


Fig. 9

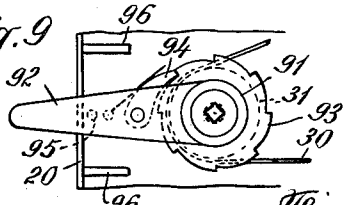


Fig. 10.

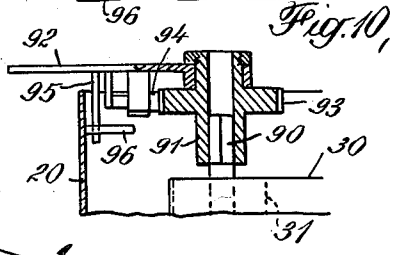


Fig. 4

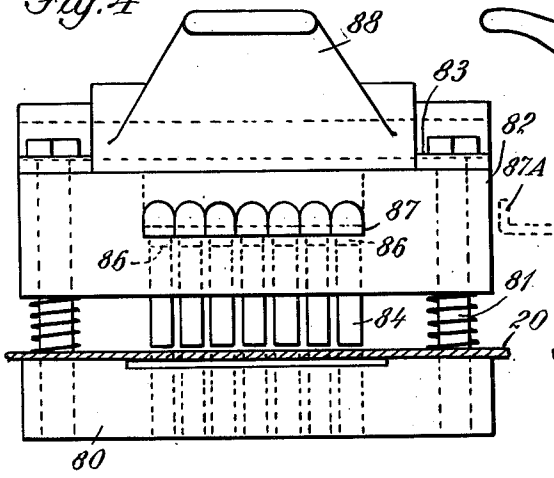


Fig. 5

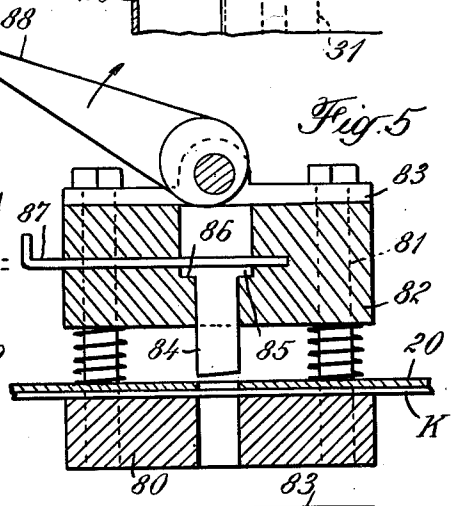


Fig. 6.

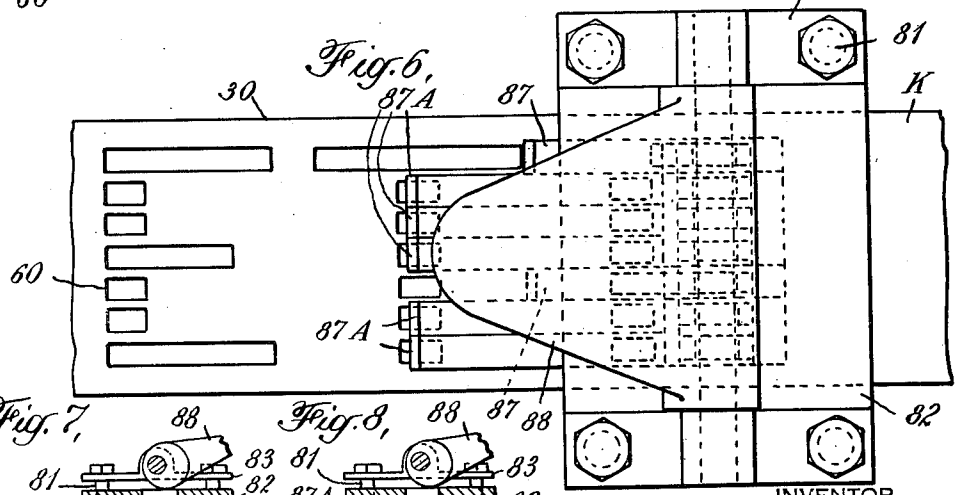


Fig. 7.

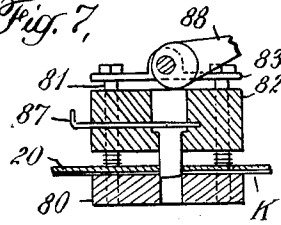
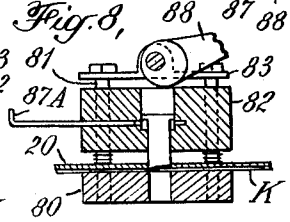


Fig. 8.



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MOVING SIGN

Filed Sept. 14, 1940 3 Sheets-Sheet 3

Fig. 11,

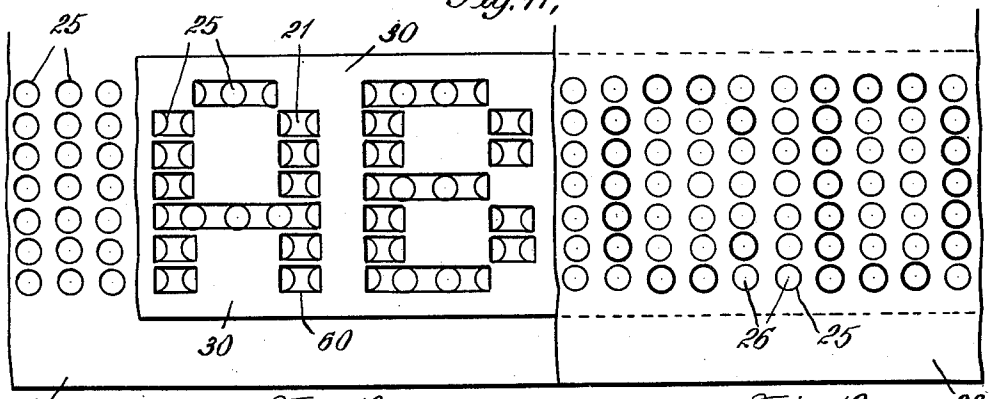


Fig. 13

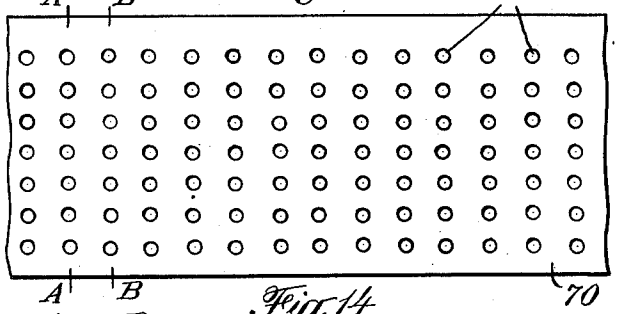


Fig. 12,

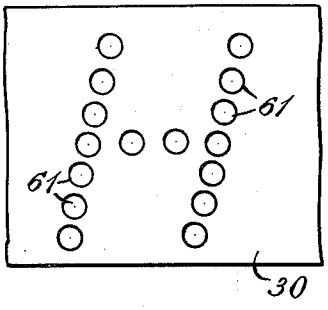


Fig. 14,

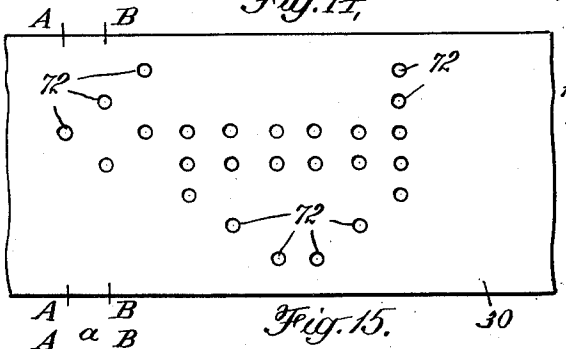


Fig. 15.

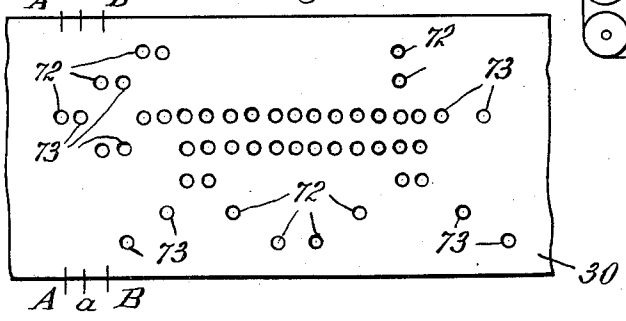
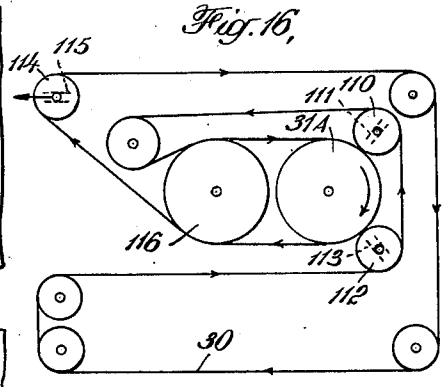


Fig. 16,



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UNITED STATES PATENT OFFICE

2,346,699

MOVING SIGN

William F. O'Gorman, New York, N. Y., assignor to Tel-A-Tale Motion Sign Corporation, New York, N. Y., a corporation of New York

Application September 14, 1940, Serial No. 356,724

11 Claims. (Cl. 40—32)

This invention relates to improvements in moving signs, of the type which comprise a stationary perforated panel and an endless movable band with perforations to cooperate with those in the panels.

Its object is to improve upon such devices as have been available heretofore and to provide a simple and inexpensive apparatus for producing changing displays. More particularly, my invention relates to the relations between the stationary and moving perforations which are so placed relatively as to eliminate disagreeable flicker and to produce novel effects.

Another specific object of the invention is to provide an arrangement for supporting the band whereby a band of maximum length may be disposed on an even plane within a space of small dimensions.

A still further object is to provide simple instrumentalities for making perforations in the band at desired intervals.

These and other objects of the invention will appear in the following specification in which I will describe certain embodiments, the novel features of which will be pointed out in appended claims.

Referring to the drawings,

Fig. 1 is a plan view of an illuminated sign which is made according to and embodies my invention;

Fig. 2 is a front elevation and Fig. 3 a sectional end elevation of the device shown in Fig. 1. The section in Fig. 3 is taken on the line 3—3 of Fig. 2;

Fig. 4 is a side elevation on an enlarged scale of a multiple punch die for perforating the band;

Fig. 5 is a sectional plan view of the perforator;

Fig. 6 is a rear elevation of the perforator and a part of the band, illustrating the operation of the perforator;

Figs. 7 and 8 are sectional views of the perforator in its depressed position. These sections are taken through one of the dies, which is not shown in section. Fig. 7 shows the relative position of the parts when a slide is over its respective die and Fig. 8 shows the same parts with the slide pulled out;

Figs. 9 and 10 are, respectively, a plan view and a sectional front elevation of a device for imparting a step-by-step movement to the band which is used in connection with the perforator;

Fig. 11 is a composite front elevation showing the front stationary panel, a part of the movable band and some of the perforations in the rear stationary panel;

Fig. 12 is a front elevation of a portion of a band perforated in another manner to produce a novel effect;

Fig. 13 is a front elevation of a template which is used in making another type of perforations in the band in order to produce animated signs;

Figs. 14 and 15 are front elevations of a band perforated in accordance with my invention in such a manner as to produce an animated sign.

Fig. 16 is a diagrammatic representation of a modified band driving arrangement.

20 designates a substantially rectangular casing within which all of the apparatus except a part of the band perforator is enclosed. 21 is a rear stationary panel and 22 a front stationary panel. These panels are set back from and parallel with the front of the casing which is recessed, as at 23, to provide edges which shield the ends and the lower edges of the front panel. A cover plate 24 (Fig. 3) extends over the upper edges of the front panel. This construction is for the purpose of shielding the face of the front panel from outside light.

The panels 21 and 22 are constructed with regularly spaced registering openings 25 in horizontal and vertical alinement. From Fig. 2 it will be seen that the horizontal spaces between the openings is greater than the vertical spaces between them, for a purpose which will be described hereinafter. Translucent beads 26 having shanks inserted in the openings in the front panel project forwardly from the face of this panel.

The panels are slightly spaced to provide for the passage of a band 30 of flexible opaque material between them. This band is endless and runs around a roller 31 driven by a motor 32 which moves the part of the band which is between the panels from right to left, as indicated by arrows in Fig. 1. The portion of the band designated by the letter A is then guided by idle rollers 33 and 34 in a direction parallel with but spaced from the stationary panels. 35 and 36 are rollers which guide the portion of the band designated by the letter B from the right to the left, as viewed in Fig. 1 near the rear of the casing 20. C designates a part of the band between rollers 37 and 38. D is a part of the band between rollers 39 and 40, and E a part between rollers 40 and 41. F is a part of the band which runs from the rear of roller 41 to the front of a roller 42 and around the latter. Considering the part of the band which is be-

tween the stationary panels as one loop of the endless band, the opposite loop of the band is the part of it which runs around this roller 42.

From the roller 42 the band runs, as at G, to and around a roller 43. H is a part of the band between rollers 43 and 44 and I a part between rollers 45 and 46 and J is a part between rollers 47 and 48. 49 and 50 are rollers which guide a part K of the band close to the rear wall of the casing 20 and between the latter and a die block 80. From the roller 50 the band passes around the rollers 51, 52 and 53 of a spring pressed adjustable tensioning device and thence to the space between the stationary panels 21, 22.

The spindle of the roller 52 of the tensioning device is slidably supported in guides and is pressed inwardly by a spring 54, the pressure of which may be adjusted by a screw 55.

It will be noted that all of the parts of the bands which have been particularly pointed out, except the part F, are parallel. There is a space provided between the part which runs between the panels and the part A for an illuminating device and a space between the parts B and K for the die block 80. There is a space between the parallel parts E and G for the diagonal part F which is necessary for the reversal of the direction of the movement of the band. By this arrangement a band of considerable length may be disposed on an even plane in a comparatively small space.

57 is a fluorescent lamp within a reflector 58 in the space between the stationary panels 21, 22 and the part A of the band. It is so placed that its light will pass through the openings 25 in the panels except when it is interrupted by the band 30.

Perforations are made in the band which register with the openings 25 in the panels. Unlike former practice, the shortest of these perforations have a longer horizontal length than the diameter of the openings, preferably of a length corresponding to the distance between the center of two horizontally adjacent openings. Such a perforation is shown at 60 in Fig. 11, through which part of two of the openings 25 in the rear panel may be seen, one closing as the other opens. The result of such a construction is that the light from lamp 57 will pass through the horizontally adjacent openings 25 in sequence, lighting one opening before the adjacent opening at the other end of the elongated slot becomes closed and as the band moves a continuous even flow of a specific set of lighted openings will pass across the front panel without the disagreeable flicker inevitable with former devices. The vertical distance between the openings 25 is shorter than the horizontal distance so that a vertical row of such openings as 60 in the band will, with the diffusive effect of the translucent beads 26, provide a substantially continuous but horizontally moving line of light.

The perforations in the band may be so disposed relatively as to produce letters, figures or other desired designs or insignia.

By making the openings in the band correspond in size to those in the panels and disposing those which produce other than horizontal lines obliquely, the novel effect is produced of causing lines of light to pass through the panels which appear to be moving vertically as well as horizontally. Such a disposition of band openings is shown in Fig. 12, representing the letter H in which the openings 61 which form the upright portions of the letter are on oblique lines slanting from the left at the bottom to the right at the top of the letter. When a band with such openings is moved from right to left between the stationary panels, the lines of light passing through the obliquely disposed openings in the band appear to move upwardly as well as horizontally. Similar or wavy effects may be produced by disposing such openings as produce substantially horizontal lines on lines on the band which are oblique to the horizontal.

I will now describe the manner in which animated figures are produced. In Fig. 13 a template 70 is shown in which are a plurality of openings 71 corresponding in position to the openings 25 in the stationary panels. This template is placed over the band 30 and holes 72 are punched through the band in desired relation. Those shown in Fig. 14, for example, represent the figure of a running dog. The distance between the lines A—A and B—B in Figs. 13, 14 and 15 is the same as the horizontal distance between the panel openings 25. After the holes 72 have been punched through the band, the template is moved back on the band half the distance between the lines A—A and B—B. That is, the line A—A of the template is moved to the position on the band indicated by the line *a—a* in Fig. 15. Other holes 73 are then punched through the band representing parts of the object in different positions.

When a band thus made is passed through the machine, it will produce the effect of a dog running across the front panel and wagging his tail.

I will now describe the multi-die perforator which is illustrated in Figs. 4–8 and the band actuator which is used with it, shown in Figs. 9 and 10.

A stationary die block 80 is affixed to the rear wall of the casing 20 by studs 81 spaced from the inner surface of the wall to allow for the passage of the part K of the band 30 which also passes between the studs. A die holder 82 is slidably mounted on these studs, pressed outwardly by springs against a plate 83 on the ends of the studs. 84 designates a vertical row of dies corresponding in number and position with a vertical row of openings 25 in the stationary panels. Each die has a head 85 and is slidably mounted in an opening in the die holder having a shoulder 86 which moves the die outwardly with the die holder. Back of each die is a slide 87 for causing the dies to move inwardly with the holder (see Fig. 7). When a slide is pulled out to the position shown at 87A in Fig. 8, the inward movement of the die holder will not be transmitted to its respective die. The die holder is forced inwardly by a cam lever 88 pivoted to the plate 83. By positioning the slides one or more of the dies will puncture the band. The band is then moved along horizontally and another opening or set of openings are punched in it.

To impart the desired step-by-step movement to the band, the mechanism shown in Figs. 9 and 10 may be used. The upper end of the spindle of the driving roller 31 is squared, as at 90, to receive a member 91 on the upper end of which is rotatively mounted a lever 92. The member 91 is provided with ratchet teeth at 93 which are engaged by a spring pressed pawl 94 pivotally supported on the lever 92. 95 is a pin depending from the lever to engage stops 96 to limit the movement of the lever. The operation of this

mechanism is obvious. When not in use it may be removed.

In order to vary the effect of the light passing through the panels, a vari-colored transparent screen 100 may be interposed between the lamp 37 and the rear panel 21. This is shown as an endless band supported by rollers 101, one of which may be connected as by gears 102 to be driven by the motor.

The driving mechanism shown in Fig. 16 comprises a motor driven cylindrical roller 31A for the endless band 30. The band passes around this driving roller and around a plurality of idle rollers. The spindles of two of these idle rollers 110 and 112 are mounted in slots 111 and 113 so that they may move toward and away from the driving roller 31A. The spindle of another idle roller 114 is mounted in a slot 115 and is pulled to the left as designated by an arrow, by a spring or other suitable tensioning device.

The band 30 passes over opposite parts of the periphery of another idle roll 116. The tension on the band 30 caused primarily by the driving roll 31A and augmented by the tensioning roll 114 pulls the rolls 110 and 112 toward the driving roll into contact with that part of the band which is between these rolls and increases the traction between the driving roll and the band. This enables the band to be driven under a minimum tension.

Many modifications of this invention may be made within the spirit and scope thereof and I intend no limitations other than those imposed by the appended claims.

What I claim is:

1. In a sign of the type which comprises a stationary panel constructed with spaced openings and a source of light at one side of the panel, a longitudinally movable perforated band in contact with the side of panel adjacent the source of light, the shortest perforations in the band being longitudinally longer than the longest longitudinal dimension of the openings in the panel.

2. In a sign of the type which comprises a stationary panel constructed with spaced openings and a source of light at one side of the panel, a longitudinally movable perforated band in contact with the side of panel adjacent the source of light, the shortest perforations in the band being longitudinally longer than the longest longitudinal dimension of the openings in the panel, the openings in the panel being circular and the openings in the band being rectangular.

3. In a sign of the type which comprises a stationary panel constructed with spaced openings and a source of light at one side of the panel, a longitudinally movable perforated band in contact with the side of the panel adjacent the source of light, the shortest perforations in the band having a longitudinal length equal to the longitudinal distance between the centers of adjacent openings in the panel.

4. In a sign of the type which comprises a stationary panel constructed with spaced openings, a source of light back of the panel and a longitudinally movable perforated band having a part interposed between the panel and the source of light, the shortest perforations in the band being longitudinally longer than the longest longitudinal dimension of the openings in the panel in which the openings in the panel are disposed in longitudinal and transverse lines with the spaces between the longitudinal lines greater than the spaces between the transverse lines.

5. In a sign of the type which comprises a stationary panel constructed with regularly spaced openings and a source of light at one side of the panel, a longitudinally movable perforated band in contact with the side of panel adjacent the source of light, in which a set of perforations in the band which in one position of the band on the panel register with perforations in the panel represent an object, and in which another set of perforations in the band, in another position of the band on the panel, register with perforations in the panel represent the same object with some of the parts thereof in different positions than those in the first set which represent the same parts.

6. In a sign of the type which comprises a stationary front panel constructed with spaced openings, a source of light back of the panel and a movable perforated band interposed between the panel and the source of light and a stationary rear panel between the band and the light having spaced openings registering with the openings in the front panel.

7. In a sign of the type which comprises a stationary front panel constructed with spaced openings, a source of light back of the panel and a movable perforated band interposed between the panel and the source of light and a stationary rear panel between the band and the light having spaced openings registering with the openings in the front panel, said panels being spaced to provide a clearance for the band.

8. In a sign of the type which comprises a stationary front panel constructed with spaced openings, a source of light back of the panel and a movable perforated band interposed between the panel and the source of light, a stationary rear panel between the band and the light having spaced openings registering with the openings in the front panel and light diffusers in the openings in the front panel.

9. In a sign of the type which comprises a stationary front panel constructed with spaced openings, a source of light back of the panel and a movable perforated band interposed between the panel and the source of light and a stationary rear panel between the band and the light having spaced openings registering with the openings in the front panel, said panels being spaced to provide a clearance for the band and light diffusers in the openings in the front panel.

10. In a sign of the type which comprises a movable band, a driving mechanism for the band comprising a power driven roller over a part of the periphery of which the band passes, an idle roller adjacent said power driven roller in contact with another portion of the band and a movable support for the idle roller whereby the tension on the band moves the idle roller into contact with the band on the power driven roller.

11. In a sign of the type which comprises a movable band, a driving mechanism for the band comprising a power driven roller over a part of the periphery of which the band passes and a transversely movable idle roller adjacent said power driven roller in contact with another portion of the band whereby the tension on the band moves the idle roller into contact with the band on the power driven roller.

WILLIAM F. O'GORMAN.