July 2, 1957 H. A. TOULMIN, JR 2,797,514

ILLUMINATING SIGN

Filed Jan. 21, 1954 2 Sheets-Sheet 1

Fig. 1.

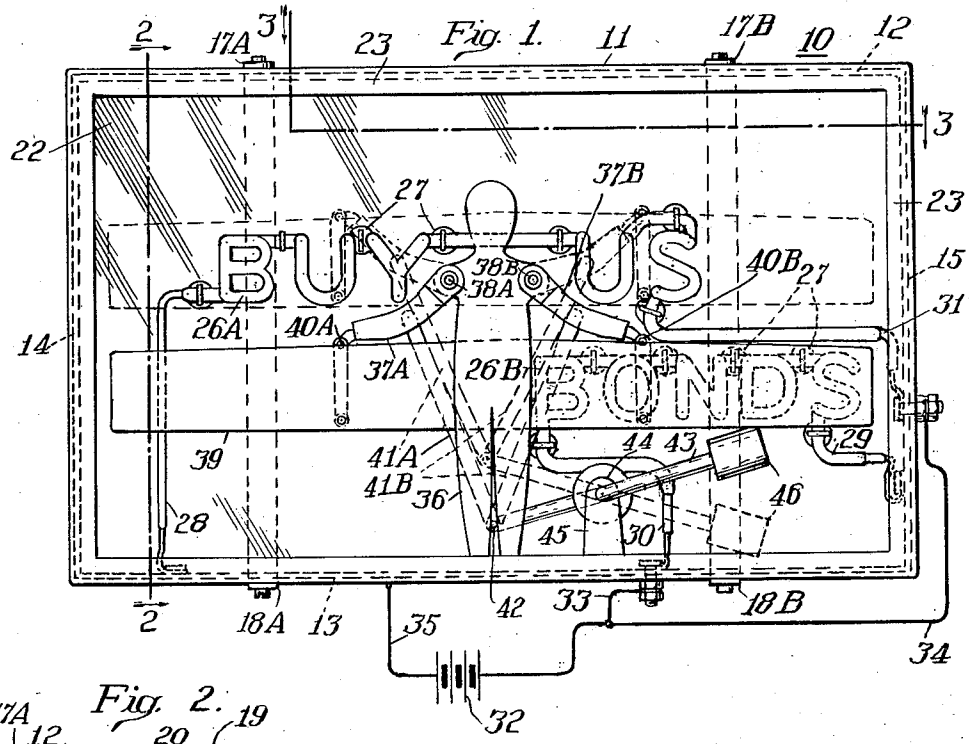


Fig. 2.

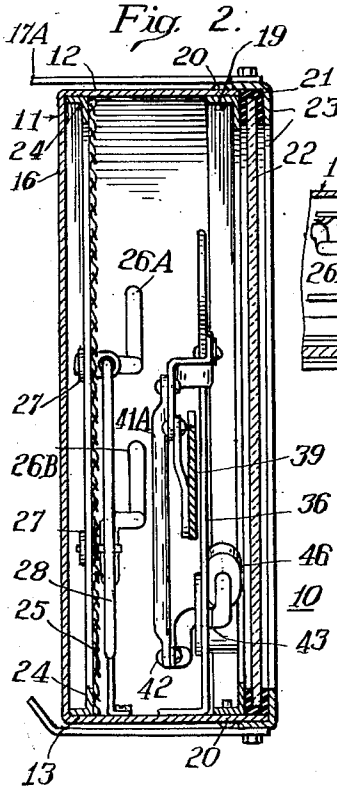
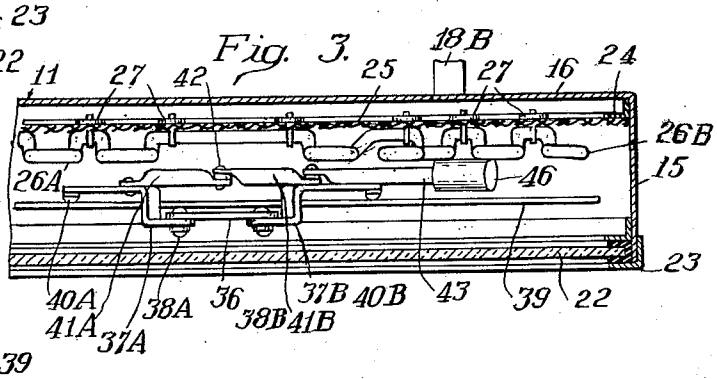


Fig. 3.



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Fig. 4.

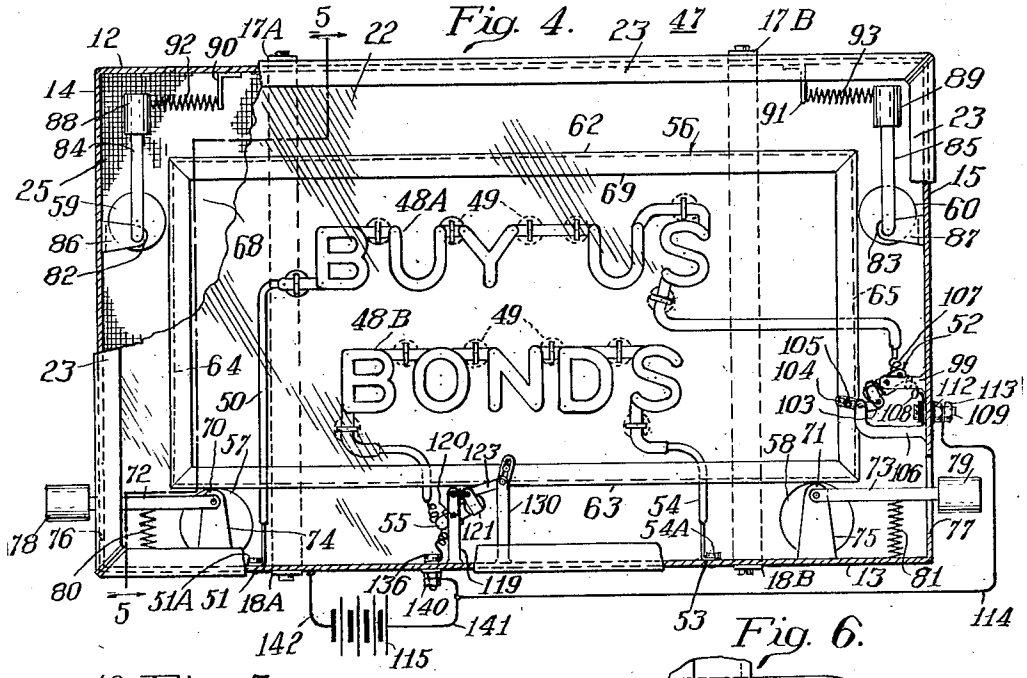


Fig. 5.

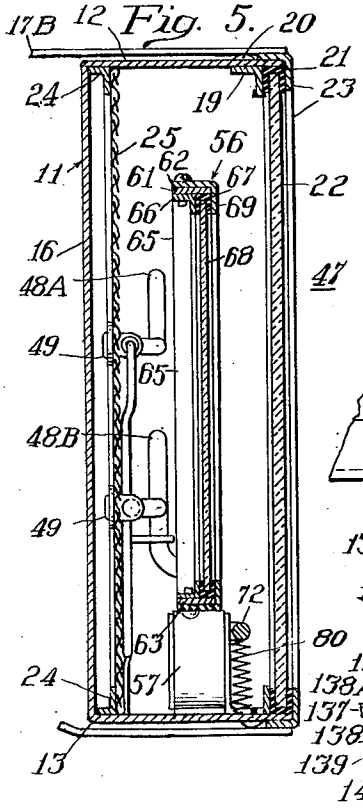


Fig. 6.

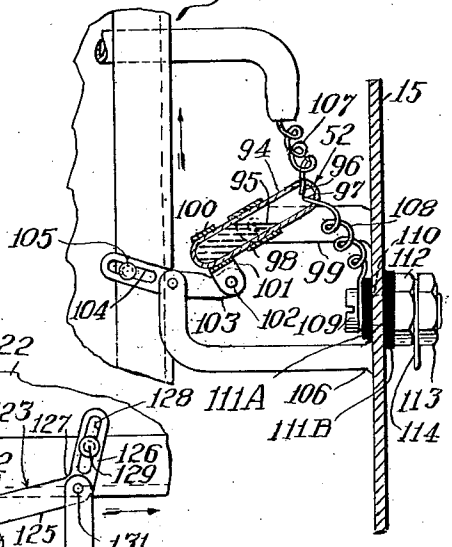
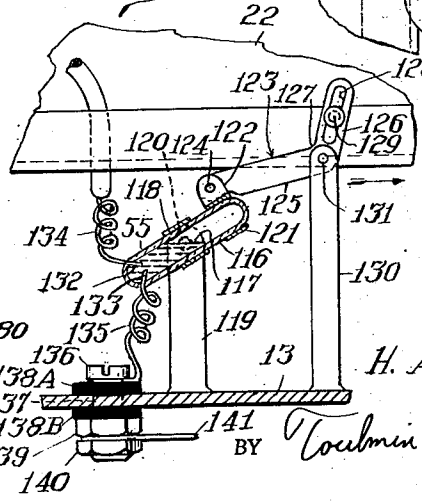


Fig. 7.



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ILLUMINATING SIGN

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Application January 21, 1954, Serial No. 405,440

4 Claims. (Cl. 40—129)

The present invention relates to an illuminated sign, more particularly to an animated illuminated sign for mounting on a vehicle, wherein the movements of the vehicle when in motion effect the animation of the sign.

A great portion of advertising carried on depends on the use of signs. These signs are of many types and vary from a simple poster to an elaborate animated illuminated sign which may extend a considerable portion of a city block. These signs have various locations in an effort to convey a message to as large a portion of the public as possible.

In an attempt to reach as many people as possible, signs have been placed on vehicles of all types. Those vehicles which are in constant use are considered to be more desirable for advertising purposes. Such a vehicle is the conventional taxicab which spends a large amount of time traveling along the more populated city streets.

In an effort to use this advertising medium signs of various types were placed usually on the rear portions of taxicabs. In the course of time more elaborate advertising means in the form of illuminated signs were placed on the rear of taxicabs. While these illuminated signs represented a great improvement over a conventional painted sign, it was felt that these illuminated signs would more quickly catch the eye if animation could be imparted to them. It was desired that a method of animation be used that would be both efficient and inexpensive.

The present invention discloses a simple and effective means of animating an illuminated sign which is particularly suitable for mounting on a vehicle. This invention essentially comprises a movable member which is associated with one end of a pivotally-mounted arm. A weight is affixed to the other end of said arm so as to counterbalance said movable member. When the sign disclosed as this invention is mounted on a vehicle the natural movements caused by starting and stopping or irregularities in the road surface will impart motion to said weight. As this weight counterbalances the movable member, these movements will cause the arm to pivot and will result in movement of the movable member. It should be borne in mind that this invention may take various forms. Two embodiments of this invention are disclosed and other forms will be pointed out throughout the description.

This movable member described above may be used to intermittently uncover portions of a lighted sign, or may be used to actuate switches to cause intermittent lighting of an illuminated sign.

The illuminated sign disclosed as this invention is extremely simple to construct, and since it has comparatively few working parts this sign requires very little attention once it has been mounted. The system of counterweighted levers disclosed in this invention makes it unnecessary to use a motor to obtain animation of a sign. The various forms of animation to which this invention can be applied are virtually unlimited. This

range would depend solely upon the ingenuity of advertising personnel.

It will be noted that an illuminated sign embodying this invention will require no additional modification in order to mount the sign on the rear of a taxicab or on any other type vehicle.

It is therefore the object of this invention to provide an improved animated illuminated sign for mounting on a vehicle.

It is another object of this invention to provide an improved structure for imparting animation to a sign.

It is an additional object of this invention to provide an animated illuminated sign for mounting on a vehicle wherein motion of the vehicle is utilized to impart animation of the sign.

It is a further object of this invention to provide a simplified system of weighted levers to impart motion to an animated sign.

It is still another object of this invention to provide an animated illuminated sign for mounting on a vehicle wherein portions of the lighted sign are intermittently covered by a movable panel actuated by a system of weighted levers which are set in motion by the movements of the vehicle.

It is a still further object of this invention to provide an animated illuminated sign wherein the lighted sign is intermittently switched on and off by switches which are actuated by a movable panel operated by a system of weighted levers which are set in motion by the movements of the vehicle.

Other objects and advantages of this invention will become readily apparent when reference is had to the accompanying description taken in conjunction with the following drawings, wherein:

Figure 1 is a front elevational view of an animated illuminated sign constructed in accordance with this invention;

Figure 2 is a sectional view taken along the line 2—2 in Figure 1;

Figure 3 is a partial sectional view taken along the line 3—3 of Figure 1;

Figure 4 is a front elevational view of another embodiment of this invention with a corner portion of the glass cover plate cut away and portions of the outer flange removed.

Figure 5 is a sectional view taken along the line 5—5 in Figure 4;

Figure 6 is a front elevational view of the switch structure comprising the switch which is actuated by vertical movement of a panel member and showing the liquid container of the tiltable switch in section; and

Figure 7 is a front elevational view showing in detail the switch structure which is actuated by horizontal movement of a panel member with the liquid container of the tiltable switch being shown in section.

Referring now to the drawings, more particularly to Figure 1, wherein like reference characters indicate the same parts throughout the various views, **10** indicates generally a sign constructed in accordance with this invention. The sign **10** comprises a substantially rectangular frame **11** which has a top wall **12**, a bottom wall **13**, vertical walls **14** and **15**, and a rear wall **16** which is preferably integral to the aforementioned walls. For purposes of strength and rigidity it is desired that the frame **11** be constructed of a suitable metal. Attached to the frame **11** are suitable top mounting brackets **17A** and **17B** and bottom mounting brackets **18A** and **18B**. By means of these brackets the sign **10** is mounted on the trunk of a taxicab or on any other desired location on a vehicle.

An inner flange **19** which is formed from a suitable size

of angle iron is fastened to the interior surfaces of the walls 12—15 by means of rivets 20. Other fastening means, such as bolts or welding may be satisfactorily employed in place of the rivets 20. A rubber gasket 21, which is substantially U-shaped in cross-section is disposed adjacent the inner flange 19 and the walls 13—16. A glass cover plate 22 is snugly received within the rubber gasket 21, and outer flange 23 is affixed to the walls 13—16 and serves to retain the rubber gasket 21 and glass cover plate 22 in place. A supporting flange 24 is mounted on the walls 12—15 and is adjacent rear wall 16. This supporting flange 24 is formed from a suitable angle iron and is affixed to the walls 12—15 in any suitable manner.

A flexible sheet of fabric 25 is mounted on the supporting flange 24. As the fabric 25 must have strength as well as a degree of flexibility, it is preferred that a glass fabric be employed. However, it is to be understood that any other suitable fabric may be satisfactorily utilized.

Supported on the flexible fabric 25 are two sections 26A and 26B of tubular lights. These tubular light sections 26A and 26B are supported by means of suitable supporting devices 27. The tubular lights 26A and 26B are preferably of the type called "neon" lights. However, it is to be understood that any other form of illumination which may be desired may be satisfactorily used in this invention. Furthermore it is not necessary that the tubular lights be in two sections. If only one or two words are to be placed on this illuminated sign, one section of tubular lights will probably be sufficient. In the event longer messages are wished to be placed on this sign, more than two tubular light sections may be utilized. By mounting the tubular lights 26A and 26B on the flexible fabric 25, the tubular lights are saved from absorbing many of the shocks which may be transmitted from the vehicle to the sign 10.

The tubular lights 26A and 26B are further supported by the flexible members 28 and 29 which are suitably attached to the bottom wall 13 and the frame 11. The flexible mounting members 28 and 29 also serve as grounds for the tubular lights 26A and 26B. The other ends of the tubular lights are supported by flexible mounting members 30 and 31, which are suitably attached to the bottom wall 13 and vertical wall 15 respectively. The flexible mounting members 30 and 31 also contain the leads to the tubular lights. The leads within the flexible mounting members 30 and 31 are connected to a suitable source of electricity 32, by means of the electric leads 33 and 34 respectively. The other side of the source of electricity 32 is grounded to the bottom wall 13 by a lead 35. The source of electricity 32 may be a battery having a suitable capacity. The source of electricity 32 may be positioned in any convenient location on the vehicle.

A vertical supporting member 36, which is illustrated as being in the shape of a man, is suitably mounted in the front portion of the bottom wall 13. The arms 37A and 37B of the man 36 are pivotally attached at the shoulders by means of the pivotal joints 38A and 38B respectively. A panel member 39 is pivotally attached at the points 40A and 40B to the arms 37A and 37B respectively. The panel member 39 is substantially the interior length of the frame 11, and has a width sufficient to cover substantially one half of the tubular lights 26A and 26B. As the panel member 39 is pivotally attached to the vertical supporting member 36, it is capable of limited movement in a vertical direction.

A pair of links 41A and 41B each have one end connected to substantially the mid-point of the arms 37A and 37B respectively. The other ends of the links 41A and 41B are pivotally joined together by a pin 42. The pin 42 also serves to pivotally connect the ends of the links 41A and 41B with one end of an arm 43. The arm 43 is substantially in the shape of a crank and the center section 43A of the arm 43 is pivotally mounted at the top end 44 of a supporting column 45 which is rigidly attached to the bottom wall 13. At the other end of the arm 43 there is affixed a weight 46, which is so selected as to counterbalance the panel member 39.

It is pointed out that in this particular embodiment of the invention the lengths of the arms 37A and 37B, the links 41A and 41B, and the arm 43 are so selected that the vertical movement of the panel member 39 is limited from a position where substantially one-half of the tubular lights are covered to a second position whereby the other half of the tubular lights are covered. However, it should be borne in mind that other link systems may be devised to achieve any other forms of animation which may be desired in such a sign.

The mode of operation of this invention is extremely simple. The sign 10 is rigidly mounted preferably on the rear of a vehicle. When the vehicle is under way there will be considerable vertical movement of the vehicle because of accelerations or decelerations in speed and because of irregularities in road surfaces. As the sign 10 is rigidly fastened to the vehicle and since the weight 46 is substantially free of the vehicle, these vertical movements of the vehicle will cause the weight to remain in substantially the same place while the sign 10 follows the vertical movements of the vehicle. As one end of the system of levers comprised of the arms 37, links 41, and arm 43 is fastened to the sign 10, motion will be imparted to the panel member 39. Once motion has been imparted to the panel member 39, relatively little vertical movement will be required to maintain oscillations of the arm 43. These oscillations of the arm 43 will result in the intermittent covering of portions of the tubular lights 26A and 26B. This intermittent covering and uncovering of the lights will catch the eye more quickly than would be the case if the sign emitted a steady illumination.

Another embodiment of this invention is disclosed in Figures 4 through 7. This second embodiment of the invention is a sign indicated generally as 47 in Figure 4. The frame and glass cover plate assembly of the sign 47 is essentially the same as that described in connection with the sign 10. The sign 47 comprises the frame 11 having side walls 12—15 and rear wall 16, top and bottom mounting brackets 17 and 18 respectively. Within the side walls 12—15 is located an inner flange 19 secured to said walls with rivets 20. A rubber gasket 21 receiving a glass cover plate 22, which is retained in place by an outer flange 23, serves to enclose the frame 11. In the rear of the frame 11 is a supporting flange 24 with a flexible fabric 25 secured thereto.

Two sections of tubular lights 48A and 48B of the type commonly referred to as "neon" lights are mounted on the flexible fabric 25 by means of a plurality of supporting devices 49. Each section of the tubular lights 48A and 48B is so formed as to convey a portion of a short advertising message. One section of tublar lights would be adequate if the message were, for example, one or two words. It should also be borne in mind that lengthier messages may be employed upon the illuminated sign 47, but may require the use of more than two sections of neon lights as disclosed in Figure 4.

The tubular light section 48A has one end fastened to the bottom wall 13 by means of a somewhat flexible supporting member 50. This member is suitably connected at point 51 by means of a bolt 51A, which connection serves as a ground for the tubular light section 48A. The other side of the tubular light section 48A is connected to one side of a tiltable switch 52. The structure and function of the switch 52 will be later described in detail.

The other tubular light section, 48B, has one end connected to the bottom wall 13 at the point 53 by means of a somewhat flexible member 54. The flexible supporting member 54 may be connected by means of a

bolt 54A to the bottom wall 13 of the frame 11. The connections at the points 51 and 53 serve to ground the tubular lighting sections 48A and 48B respectively to the frame of the sign 47. The other end of the tubular light section 48B is connected to one end of a tiltable switch 55 which will be later described in detail.

A panel member indicated generally as 56 is movably supported upon a pair of substantially circular bottom cams 57 and 58. A second pair of circular side cams 59 and 60 laterally position the panel member 56.

The panel member 56 comprises a rectangular frame 61 which has top wall 62 and bottom wall 63 and side walls 64 and 65. An inner flange 66 formed from suitable angle iron is affixed within the frame 61. A rubber gasket 67 which is substantially U-shaped in cross-section is positioned against the inner flange 66 and the walls 62—65.

A glass plate 68 is received within the rubber gasket 67. An outer flange 69, which is secured to the walls 62—65 and is formed of a suitable angle iron, serves to retain the rubber gasket 67 and glass plate 68 in place.

Returning now to the bottom circular cams 57 and 58, these cams are fastened to the ends 70 and 71 of the arms 72 and 73 respectively. The arms 72 and 73 are pivotally mounted at their ends 70 and 71 to a pair of vertical supporting columns 74 and 75 respectively. The vertical supporting columns 74 and 75 have their other ends rigidly fastened, as by welding, to the bottom wall 13 of the sign 47. The arms 72 and 73 protrude through slots 76 and 77 respectively, which are located in the vertical walls 14 and 15 respectively of the frame 11. Weights 78 and 79 are mounted on the free ends of the arms 72 and 73 respectively. Springs 80 and 81 are used to bias the arms 72 and 73 respectively in a substantially horizontal position when the panel member 56 is positioned upon the bottom cams 57 and 58.

The structure relating to the side cams 59 and 60 is somewhat similar to the structure described in connection with the bottom cams 57 and 58. The side cams 59 and 60 are each fastened to the ends 82 and 83 of side arms 84 and 85. The side arms 84 and 85 are also pivotally mounted at the ends 82 and 83 respectively to a pair of horizontal supporting members 86 and 87 respectively. The horizontal supporting members 86 and 87 have their other ends rigidly fastened, as by welding, to the vertical walls 14 and 15 respectively of the sign 47. Weights 88 and 89 are affixed to the free ends of the side arms 84 and 85 respectively.

A spring 92 has one end fastened to the spring mounting bracket 90 and the other end fastened to the weight 88. Another spring 93 has one end fastened to the spring mounting bracket 91 and the other end to the weight 89. These springs 92 and 93 are so selected that they bias the side arms 84 and 85 in a substantially vertical position when the panel member 56 is in its normal position.

Returning now to the tiltable switches 52 and 55, reference is made to Figures 6 and 7 which show these switches in detail. The switch 52 comprises a closed elongated container 94 having therein a quantity of liquid mercury 95. A pair of contacts 96 and 97 are mounted at one end of the closed container 94. The closed container 94 is supported by a bracket 98 which is pivotally mounted on a horizontal bracket 99 which in turn is secured to the vertical wall 15. A clamping bracket 100 is positioned around that end of the closed container 94 which does not have the contacts 96 and 97. The clamping bracket 100 has an extension 101 which is pivotally connected at the point 102 to a bracket arm 103. The bracket arm 103 has a slot 104 therein which receives a pin 105 fastened to the panel member 56. A second horizontal bracket 106 has a right-angle bend therein and has one end fastened (preferably by welding) to the vertical wall 15, and the other end pivotally fastened to the approximate mid-point of the bracket arm 103.

In the tiltable switch 52 the contact 96 is connected by means of a flexible conductor 107 to one side of the tubular light section 48A as described above. The other contact 97 is connected by means of a flexible conductor 108 to a contact screw 109 which is inserted through an opening 110 in the vertical wall 15. Insulating washers 111A and 111B are placed on the contact screw 109 on either side of the vertical wall 15. A nut 112 secures the contact screw 109 to the wall 15. A second nut 113 secures a lead 114 to the contact screw 109. The lead 114 runs to one side of a battery 115.

Tiltable switch 52 is shown in its normal position in Figure 6. It can be seen that the closed container 94 is tilted at an angle so that the body of mercury 95 is entirely clear of the contacts 96 and 97. Consequently there will be no contact between these contacts and the circuit will be broken. However, it can be seen that vertical movement of the panel member 56 will cause the container 94 to assume a substantially horizontal position. In this position the body of mercury 95 will contact both the contacts 96 and 97, and a circuit will be completed from the battery 115 to the tubular light section 48A. The making of this circuit will result in the tubular light section 48A being illuminated. Subsequent motion of the panel member 56 which causes the container 94 to approach its normal position will result in the circuit being broken and the tubular section 48A will no longer be illuminated. The manner in which the panel member 56 is caused to move will be described in detail later.

Proceeding now to Figure 7 wherein is illustrated tiltable switch 55, it can be seen that the structure relating to the tiltable switch 55 is very similar to that described above in connection with tiltable switch 52. The tiltable switch 55 comprises an elongated container 116. This closed container 116 has a body of liquid mercury 117 therein, and said body of mercury is free to move about within the container 116. A center clamping bracket 118 is positioned about the mid-point of the closed container 116 and the bracket 118 is pivoted from a vertical support bracket 119 at the point 120. An end clamping bracket 121 is positioned about one end of the closed container 116 and end bracket 121 has an extension 122. The extension 122 is pivotally connected to a crank arm 123 by a pin 124. The crank arm 123 is comprised of integral arms 125 and 126 which are joined together at the point 127 to form an angle of approximately 120°. The arm 126 has a longitudinal slot 128 therein and said slot receives a headed pin 129 which is attached to the panel member 56. The crank arm 123 is pivotally attached at the juncture 127 to a second vertical supporting bracket 130 by means of the pin 131.

Within the closed container 116 at the end away from the clamping bracket 121 there is mounted a pair of spaced contacts 132 and 133. The contact 132 is connected by means of a flexible conductor 134 to one end of the tubular lighting section 48B. The other contact 133 is connected by means of a flexible conductor 135 to a contact screw 136 which is inserted through an opening 137 in the bottom wall 13 of the frame 11. A pair of insulating washers 138A and 138B is placed on the contact screw 136 on either side of the bottom wall 13. A nut 139 secures the contact screw 136 to the wall 13 and a second nut 140 secures the lead 141 in electrical contact with the contact screw 136. The lead 141 goes to one side of the battery 115 as indicated in Figure 4.

From the other side of the battery 115 there is a ground lead 142 which is connected to the bottom wall 13 of the frame 11 of the sign 47. By grounding the tubular light sections 48A and 48B and the battery 115 to the frame of the sign 47 a complete electrical circuit is made betweeen the battery and the tubular light sections.

Reference to Figure 7 will reveal that the normal position of the closed container 116 is at an angle wherein

the contact end of the container is lower than the other end of the container. In this position the body of liquid mercury **117** will flow to the contact end and will make electrical contact between the contacts **132** and **133**. Consequently, an electrical circuit will be completed between the battery **115** and the tubular lighting section **48B**. Hence, in the normal position, the tubular lighting section **48B** will be lit. By means of the system of linkages previously described, it can be seen that horizontal movement of the panel member will result in the clamp end of closed container **116** being depressed below the pivot point **120**. In this position the body of mercury **117** will flow away from the contacts **132** and **133** and the electrical circuit to the tubular lighting section **48B** will be broken.

The actuation of the movable panel **56** of the sign **47** illustrated in Figure 4 is accomplished in a manner similar to that employed in imparting motion to the panel member **39** in the sign **10** disclosed in Figure 1. Movements of the vehicle upon which this sign is mounted will cause the cams **57—60** to rotate about their respective axes and thereby effect movement of the panel member **56**. The vertical and horizontal movements of the panel member will result in actuation of the tiltable switches **52** and **55** in the manner described above. As described in connection with the sign **10**, the sign **47** being rigidly secured to the vehicle will follow the movements of the vehicle. During these movements the weights **78**, **79**, **88**, and **89** will remain relatively stationary due to inertia. Consequently the cams **57—60**, which are respectively rigidly secured to bottom arms **72** and **73** and the side arms **84** and **85** will rotate about the pivot points of the respective supporting columns **74** and **75**, **86** and **87**. This movement of the cams will result in a camming action against the surface of the panel member **56** with which said cams are in contact. This camming action in turn will effect movement of the panel member **56**.

Thus it can be seen that the above-described embodiments of this invention disclose a very simple and effective way of animating a sign. Moreover, the sign itself is one complete unit. The only source of energy required is a battery for illumination of the sign, and this battery may be placed within the sign itself. Consequently, the complete sign unit may be mounted in virtually any location which will add movement.

This sign may also be satisfactorily used on other moving forms of transportation, such as trains, aeroplanes, or ships. In addition this sign may be placed on a suspended platform located on a building or the ground, so that the wind acting upon the suspended platform will impart animation to the sign.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and accordingly it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed as this invention is:

1. An illuminated sign comprising a frame having a front opening, a flexible supporting member mounted in the rear portion of said frame, tubular lighting means

affixed to the front side of said supporting member, a movable panel member spaced forwardly from said tubular lighting means to effect intermittent direct transmission of light rays from said lighting means to the viewer, pivotally-mounted arm means, said movable panel member being operatively connected to one end of said arm means, and a weight on the other end of said arm means.

2. In an illuminated sign, a frame having a front opening, a flexible supporting member mounted in the rear portion of said frame, lighting means affixed to the front face of said flexible member, vertical supporting means upstanding within said frame, movable means connected to said vertical supporting means and adjacent said lighting means to effect intermittent direct transmission of light rays from said lighting means to the viewer, pivotally-mounted arm means, means operatively connecting one end of said arm means with said movable means, and a weight on the other end of said arm means to partially counterbalance said movable means.

3. In an illuminated sign, a frame having a front opening, a flexible supporting member mounted in the rear portion of said frame, lighting means affixed to the front face of said flexible member, a vertical supporting member affixed to said frame, a panel member movably connected to said vertical member, said panel member adapted to intermittently cover different portions of said lighting means, pivotally-mounted arm means, linkage connecting one end of said arm means and said panel member, and a weight on the other end of said arm means partially to counterbalance said panel member.

4. In an illuminated sign adapted for mounting on a vehicle, a substantially rectangular frame having a front opening, a flexible supporting member mounted in the rear portion of said frame, tubular lighting means affixed to the front face of said flexible member, a vertically-extending supporting member in the front portion of said frame, a panel member positioned in front of said tubular lighting means and adapted to intermittently cover portions of said lighting means, linkage means connecting said panel member to said vertical supporting member whereby said panel member has reciprocating movement, an arm member pivotally-mounted in the front portion of said frame, linkage means connecting one end of said arm member with said aforementioned linkage means, and a weight on the other end of said arm member to partially counterbalance said panel member, whereby movement of the vehicle will cause relative vertical movement of said weight to the frame thereby reciprocating said panel member.

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