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[54] ROCKER ARM PRISM DISPLAY

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[51] Int. Cl. G09f 11/00

[58] Field of Search 40/61, 62, 130 K, 130 B, 137, 40/28; 350/112, 287

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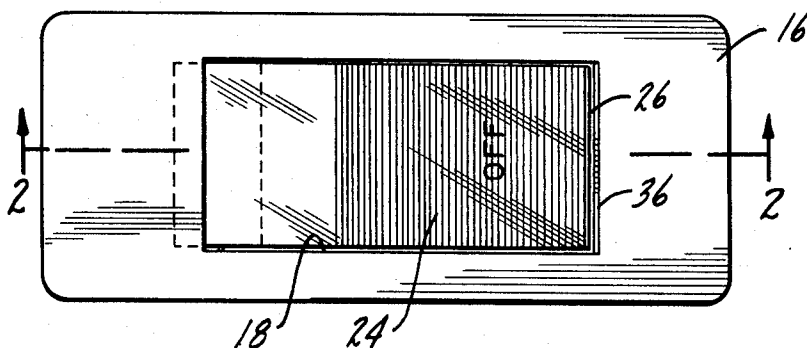
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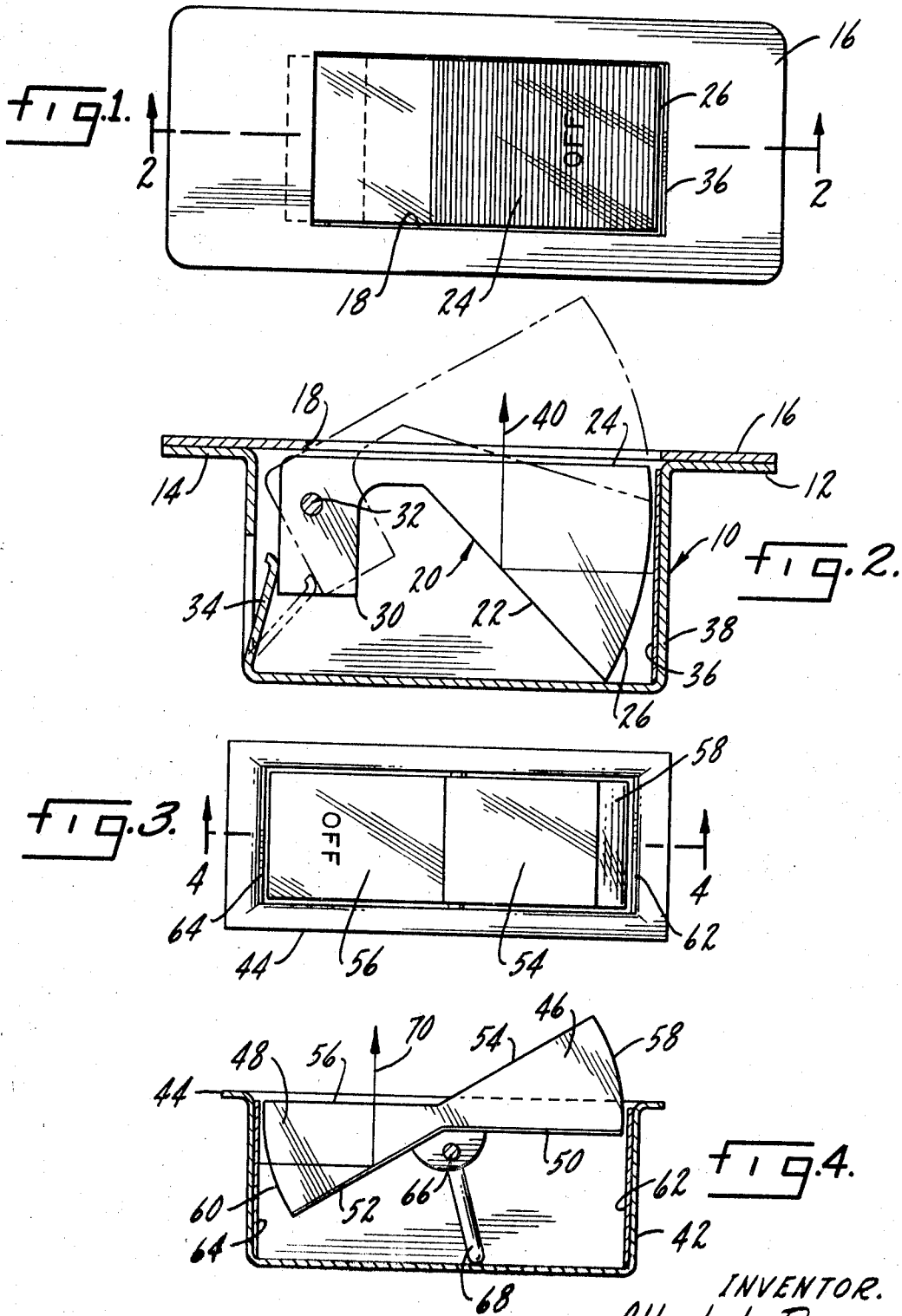
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ABSTRACT

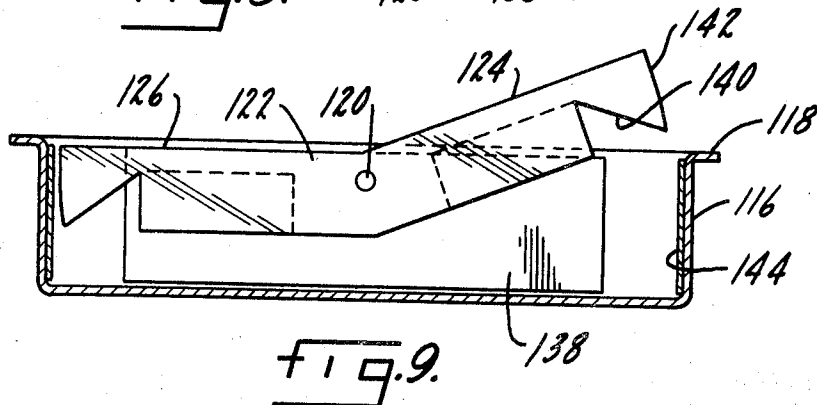
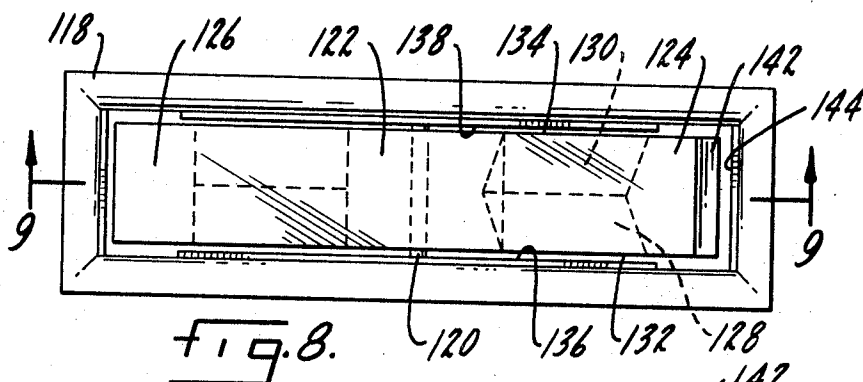
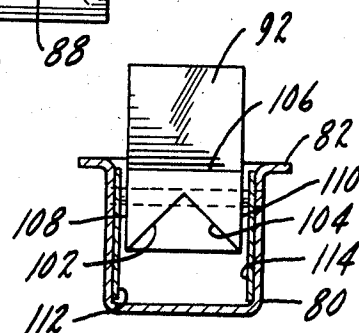
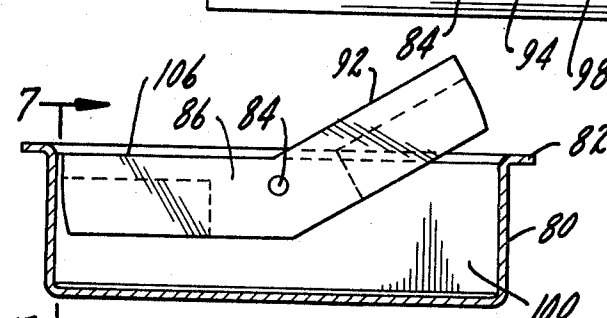
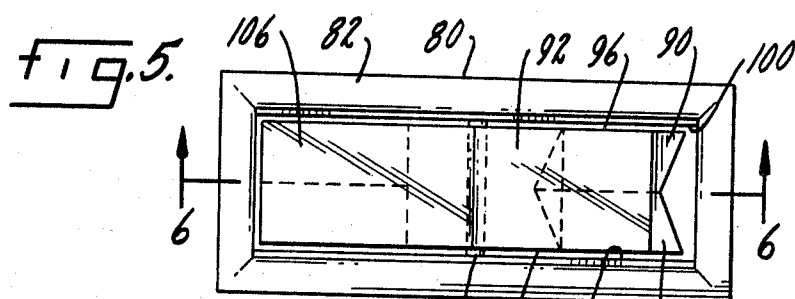
A display device in which one or more prisms are moved between at least two fixed positions. Each prism has an image surface, an object surface and a reflecting surface and there is indicia placed adjacent the path defined by movement of each object surface. The indicia is visible at an image surface in only one position of the prism.

11 Claims, 9 Drawing Figures





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ROCKER ARM PRISM DISPLAY

The present invention relates to prism display devices and is a continuation-in-part of my copending application, Ser. No. 747,717, filed July 25, 1968, now abandoned.

SUMMARY OF THE INVENTION

A primary purpose of the present invention is a display device in which one or more prisms may be oscillated back and forth between two positions to display indicia positioned adjacent the object face of the prism, with the display indicating the condition of a switch or instrument.

Another purpose is a display device of the type described in which a single prism may be utilized to reflect indicia to an image surface, with the prism being movable between two positions, only one of which places the object surface of the prism adjacent the indicia.

Another purpose is a prism display device in which the prism may be rocked between at least two fixed positions.

Another purpose is a prism display device utilizing a plurality of prisms, each of which may be moved or rocked between at least two fixed positions.

Another purpose is a prism display device which may be oscillated between at least two positions, in one of which indicia positioned adjacent the object face of the prism will be reflected to the image face.

Other purposes will appear in the ensuing specification, drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated diagrammatically in the following drawings wherein:

FIG. 1 is a top plan view of a prism display device of the type described,

FIG. 2 is a section along plane 2—2 of FIG. 1,

FIG. 3 is a top plan view of a second form of prism display device,

FIG. 4 is a section along plane 4—4 of FIG. 3,

FIG. 5 is a top plan view of a further form of prism display device,

FIG. 6 is a section along plane 6—6 of FIG. 5,

FIG. 7 is a section along plane 7—7 of FIG. 6,

FIG. 8 is a top plan view of yet a further form of prism display device, and

FIG. 9 is a section along plane 9—9 of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIGS. 1 and 2, a housing is indicated generally at 10 and may be in the shape of a rectangular box, with an open top and outwardly extending flanges 12 and 14. Covering the open top of the box 10 and mounted on the flanges 12 and 14 is a cover 16 having an opening indicated at 18.

Positioned within the box 10 is a reflecting prism indicated generally at 20 and including a reflecting surface 22, an image surface 24 and a generally curved object surface 26. One position of the prism 20 is indicated in full lines in FIG. 2 and the second position is indicated in broken lines. The prism 20 is effective to display any indicia or object positioned adjacent or at the object surface 26 to the image surface 24. The reflecting surface 22 may merely be a highly polished surface, or it may be suitably mirrorized, for example by a vacuum deposit of aluminum. In this connection, the prism 20 must be formed of a suitably transparent or translucent material. Both glass and types of plastic, for example lucite, acrylic, styrene or the like, have been found to be satisfactory.

Integral with the prism 20 is an L-shaped section 30, which may be mounted on a pin 32 journaled in opposite sides of the box 10. A portion of the box 10, indicated at 34, may be bent inward so as to provide a lock or spring to hold the prism in one of its fixed positions.

Suitable indicia, indicated at 36, is attached to a wall 38 of the box 10 and is positioned adjacent the path defined by movement of the object face. In the full line position of FIG. 2 the indicia 36 will be reflected, in the path of arrow 40 to the

image face. It should be understood that I have ignored refraction in going from air to the material of the prism 20, as generally the angles of refraction can be controlled by material selection and the angular relationship between object and reflecting surfaces. The indicia or object 36, which may be both a combination of letters, for example the word "off", as well as a color or a graphic design, may be reflected through the object surface 26 to reflecting surface 22 and then to the image face or surface 24. Thus in the full line position of the prism 20, the word "Off" or some other suitable alpha-numeric information or graphic design is displayed at the image face of prism.

By pressing downward on the L-shaped section 30, the resistance of the spring 34 will be overcome and the prism will move to the broken line position of FIG. 2. Note that in this position the indicia 36 is no longer adjacent the object face, and therefore only ambient light will be reflected to the image face of the prism. In effect, the device of FIG. 1 is a two-position display or position indicator, which may be suitably attached to a switch or other instrument. In one position, alpha-numeric information is displayed, whereas in the second position it is not. The prism oscillates or rocks or moves about the axis of the pin 32, which axis is parallel to the object surface, the image surface and to the reflecting surface.

FIGS. 3 and 4 show a second form of rocker type of prism reflecting device. A box 42, similar to the box 10, may have a flange 44 which extends peripherally around it. A suitable cover may be added, as in FIG. 2, if desired. Positioned within the box 42 are a pair of reflecting prisms 46 and 48. Each of these prisms have reflecting surfaces 50 and 52, image surfaces 54 and 56, and object surfaces 58 and 60. The prisms are shaped generally as shown in FIG. 2, and they are integral or molded into a single part or body. Indicia indicated at 62 and 64 is positioned adjacent the paths defined by movement of the object surfaces 58 and 60. A pin 66, journaled in opposite sides of the box 42, may provide the axis for rotation of the prisms. Extending downwardly from the center of the body is a lock 68 which is effective to hold the prisms in one of two fixed positions.

In the position of FIG. 4, the indicia 64 will be reflected, as indicated by arrow 70, to the image face 56. In a second position, when prism 46 is down and prism 48 is up, the indicia 62 will be reflected by reflecting surface 50 to the image face or surface 54. Thus the two prisms, combined into a single integral part, have two positions. In one position one set of indicia, which again may contain alpha-numeric information as well as a color indication, may be displayed, whereas, in the second position the other set of indicia is displayed. The rocker type of display shown may be suitably connected to a switch or some other instrument so as to indicate both the condition of the switch or instrument, and also to serve as the means for operating the switch or instrument. Thus, not only does the invention relate to a display device, but also to a means for operating an instrument or switch.

Note that the axis defined by the pin 66 is parallel to both reflecting surfaces, both object surfaces and both image surfaces. The indicia 62 and 64 is positioned adjacent the paths defined by movement of the two object surfaces. As shown, the object surfaces are generally curved, although obviously this is not necessary and they may be flat.

The invention, as shown in the drawings, includes both a double prism and a single prism. Obviously, the invention is equally applicable to further multiples of prisms. For example, there are four-way rockers in which the prism principle disclosed herein can be utilized. There are also three-way rocker switches which could similarly use the prism principle to both simultaneously display an indication of a switch or instrument and to operate the same. What is important in the invention is that there is a display device which has at least two positions and in only one of which will there be indicia displayed by the prism. In this connection the invention should not be limited to a two-position device. In display devices with more than two prisms, each prism may be movable between more than two fixed positions.

FIGS. 5, 6 and 7 illustrate a further form of prism display device in which the object surface moves in a path generally perpendicular to the axis about which the prism moves. A housing 80 may have an outwardly directed flange 82 and may mount a pin 84 which serves as the axis for movement of the prism display device. Positioned within the housing 80 is a prism member 86 which may be made up of four separate prisms. At the right are reflecting surfaces 88 and 90. There is a common image surface 92 and object surfaces 94 and 96. Positioned adjacent the object surfaces 94 and 96 are suitable indicia 98 and 100. In the position shown in FIG. 6, the right-hand prisms are above the indicia 98 and 100 and so the information on this indicia is not displayed at the image surface 92.

At the left-hand side there are reflecting surfaces 102 and 104, a common image surface 106 and object surfaces 108 and 110. Again, there is indicia 112 and 114 which is displayed at the image surface 106. Although not shown, there may be a suitable spring or lock to hold the member 86 in one of its two fixed positions.

The principal difference between the structures shown in FIGS. 5, 6 and 7 and the prism display devices of FIGS. 1-4, is that the object surfaces are generally perpendicular to the axis of movement rather than being parallel to it. This is advantageous in those applications where space will not permit substantial movement of the prism member. In the structures of FIGS. 1-4 it requires greater movement of the prism member to change the display than in the device of FIGS. 5-7. Note that the prism member includes four separate prisms, there being two pairs of prisms with the reflecting surfaces of each pair having a common edge or at least adjacent edges in that situation where the reflecting surfaces do not come to a full V as illustrated particularly in FIG. 7.

FIGS. 8 and 9 show a combination of the prism display devices of FIGS. 1-4 and FIGS. 5-7. A box or housing 116 may have an outwardly directed flange 118 and may mount a pin 120. A prism member 122 may be positioned within the housing 116 for rocking movement between two fixed positions. Again, there may be a suitable spring or lock to hold the prism member in either fixed position. At the right, there is a common image face 124 and at the left there is a second common image face 126. Only the right-hand side of the prism member 122 will be described in detail, since the left-hand side is a duplicate. There are reflecting surfaces 128 and 130 which cooperate with object surfaces 132 and 134 to display information on indicia tapes 136 and 138 to the common image surface 124. As was the case in FIGS. 5-7, the reflecting surfaces 128 and 130 may have a common edge or at least adjacent edges. In addition, there is a further prism having a reflecting surface 140 and an object surface 142 positioned to move in a path adjacent indicia 144. It should be noted that this portion of the prism member 122 is arranged similar to the structures shown in FIGS. 1-4.

Movement of the prism member 122 between one of its two fixed positions changes the display and in this case there can be three different indicia displayed in either position. There may be an on-off indication, for example, from the end indicia 144 and there may be color or graphic designs displayed from the side indicia 136 and 138. As was true with the other forms of the invention, the prism may be made of a suitable plastic material, either transparent or translucent, and the reflecting surfaces may be suitably mirrorized to provide a high degree of reflection.

Whereas the preferred form of the invention has been shown and described herein, it should be realized that there are many modifications, substitutions and alterations thereto within the scope of the following claims.

I claim:

1. A display device including a prism having a reflecting surface, an object surface and an image surface, a housing at least partially enclosing said prism, said prism being movable about an axis, generally parallel with said image and reflecting surfaces, between at least two stationary positions, indicia attached to a portion of said housing and positioned adjacent the path defined by movement of said object surface, said indicia being reflected to said image surface in one position of said prism, and means holding said prism in one of said stationary positions including a spring member integral with an extending outwardly from said housing and into contact with said prism.

2. The structure of claim 1 further characterized by and including a pin carried by said housing, with said pin defining the axis of movement of the prism.

3. The structure of claim 1 further characterized in that said object surface is curved, with said image surface being generally in a single plane.

4. A display device including a plurality of integral prisms, each having a reflecting surface, an object surface and an image surface, a housing at least partially enclosing said prisms, each of said prisms being movable about a common axis generally parallel to the object surfaces between at least two positions, indicia positioned adjacent each path defined by movement of each object surface, each indicia being reflected to its image surface in only one position of each prism, and means for holding said integral prisms in one of said positions including a pin-like member extending away from said common axis and bearing against said housing.

5. The structure of claim 4 further characterized in that said image surfaces are joined together.

6. A display device including a prism member having a reflecting surface, an object surface and an image surface, said prism being movable about an axis generally perpendicular to said object surface between at least two stationary positions, indicia positioned adjacent the path defined by movement of said object surface, said indicia being reflected to said image surface in one position of said prism.

7. The structure of claim 6 further characterized in that said prism member includes a pair of reflecting surfaces, and a pair of object surfaces, there being indicia positioned adjacent the path defined by movement of each object surface.

8. The structure of claim 6 further characterized in that said prism member includes a plurality of prisms, each having a reflecting surface, an object surface and an image surface, each prism being movable about an axis generally perpendicular to its object surface between at least two stationary positions, there being indicia positioned adjacent the path defined by movement of each object surface, with the indicia being reflected to the image surface in only one position of each prism.

9. The structure of claim 8 further characterized in that said plurality of prisms includes at least one prism having an object surface parallel to the axis of movement of said prism member.

10. The structure of claim 6 further characterized by and including a second prism having a reflecting surface, an object surface and an image surface, said second prism being movable with said first prism, with the object surface of the second prism being generally perpendicular to the object surface of the first prism.

11. The structure of claim 10 further characterized in that said prisms have a common image surface, and indicia positioned adjacent the path defined by movement of the second object surface, said last-named indicia being reflected to the common image surface in one position of said prisms.

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