April 2, 1957 L. DE F. HUNTER 2,787,785

LUMINOUS INDICATOR

Filed Feb. 25, 1954

Fig. 2

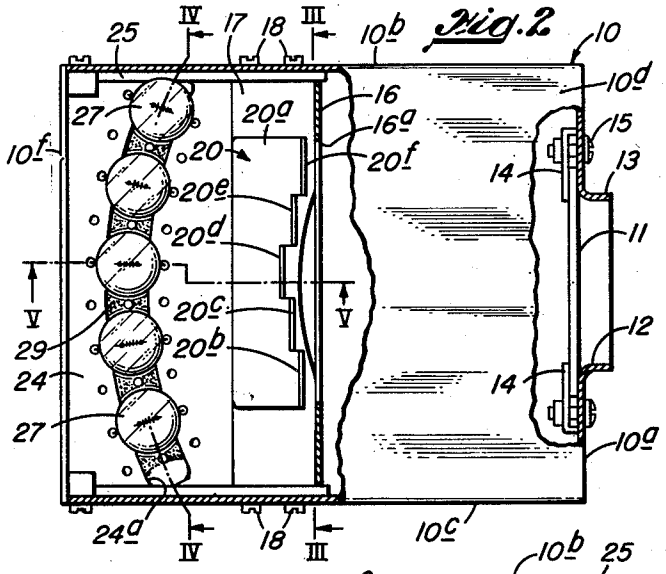


Fig. 1

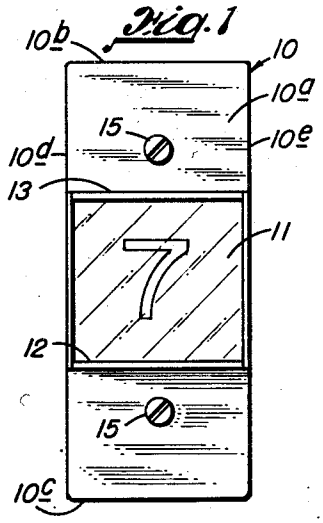


Fig. 3

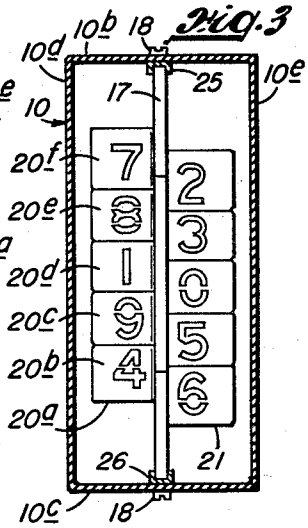


Fig. 5

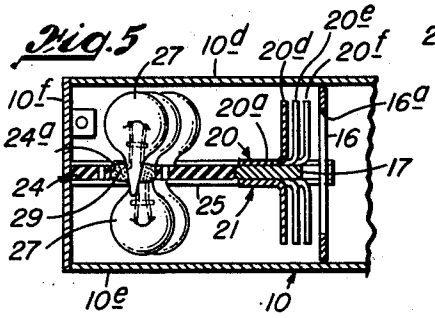
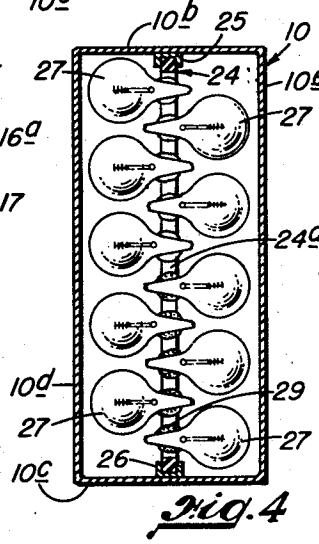


Fig. 4



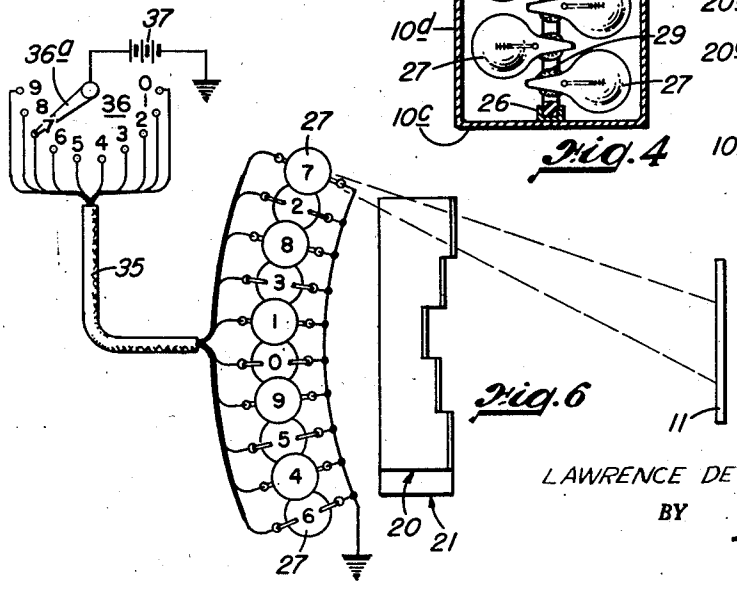


Fig. 6

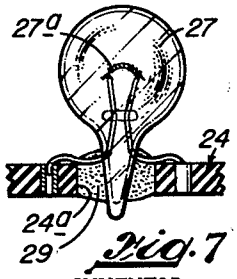


Fig. 7

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LUMINOUS INDICATOR

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4 Claims. (Cl. 340—378)

This invention relates to visual display or indicating devices, and particularly to devices capable of selectively displaying any one of a plurality of symbols, such as different letters, numbers, etc.

An object of the invention is to provide a simple, compact and practicable indicator having no moving part for displaying within the same area within a single panel space any selected one of a plurality of symbols.

A further object is to provide an indicator of such dimensions that if a group of symbols, such as a multi-digit decimal number, is to be displayed, the indicator will be narrow enough to enable the group of indicators to display the symbols in a single line with normal spacing.

Other more specific objects and features of the invention will appear from the description to follow.

Briefly, the invention comprises a casing having a translucent screen panel or window in the front end and containing a plurality of transparencies of different symbols and a separately energizable lamp back of each transparency, so arranged that each lamp casts an image of its associated transparency on the translucent window. The construction is such as to enable the installation in a relatively small casing of a large number of transparencies and lamps, each capable of producing a clear image (one at a time) within the same area on the same screen.

A full understanding of the invention may be had from the following detailed description with reference to the drawing, in which:

Fig. 1 is a front elevational view of an indicator in accordance with the invention.

Fig. 2 is a side elevation with portions broken away.

Fig. 3 is a cross section taken in the plane III—III of Fig. 2.

Fig. 4 is a sectional view taken along the curved line IV—IV of Fig. 2.

Fig. 5 is a section taken along the line V—V of Fig. 2.

Fig. 6 is a schematic diagram illustrating the operation of the indicator.

Fig. 7 is an enlarged view of one of the lamps of the indicator, the view being taken along the line V—V in Fig. 2.

The invention as disclosed comprises a casing **10** in the form of a rectangular parallelopiped having a front wall **10***a*, a top wall **10***b*, a bottom wall **10***c*, side walls **10***d* and **10***e*, respectively, and a rear end wall **10***f*. The front wall **10***a* comprises a translucent screen or window **11** which is positioned back of an opening **12** in the wall proper. Preferably, the wall is out-turned, as indicated at **13**, away from the window **11** to slightly shield the latter against side illumination, so that illuminated symbols projected thereon from the interior of the casing will be more readily visible. The translucent screen or window **11** may be of ground glass or any other suitable translucent material and may be held in place by a pair of clips **14**, which in turn are secured to the front wall **10***a* by screws **15**.

Positioned approximately midway of the casing **10** is a vertical transverse partition **16**, the primary purpose of

which is to provide a light barrier and which has a single large window **16***a* through which images of transparencies are projected onto the window **11** by a structure to be described.

Positioned immediately back of the partition **16** and at right angles thereto is a vertical supporting member **17** which extends between and is secured at its opposite ends to the top and bottom walls **10***b* and **10***c*, respectively, by screws **18**. This supporting member **17** has secured thereto a pair of symbol-defining transparency members **20** and **21**, respectively, which may be secured by soldering, welding or in any other suitable manner to the opposite sides of the vertical supporting member **17**.

The transparency member **20** comprises a flat base portion **20***a* and a plurality of symbol-defining stencil portions **20***b*, **20***c*, **20***d*, **20***e* and **20***f*, respectively. The member **20** is preferably constructed of very thin sheet metal which can be readily formed and cut, and yet is completely opaque to light. The stencil portions **20***b* to **20***f*, inclusive, are bent at right angles to the base portion **20***a*, but they are preferably differently spaced from the window **11**, although each lies in a plane parallel to the window **11**. As best shown in Fig. 3, the stencils **20***b* through **20***f* each have portions cut out to produce the different symbols to be represented, which in this case are different numerals.

The member **21** is similar to the member **20**, except that the symbol-bearing portions thereof are staggered with respect to the symbol-bearing portions of the member **20** and display different symbols.

Normally positioned rearwardly from the vertical supporting member **17**, but in the same plane therewith, is a vertical supporting panel **24** which may be of insulating material and removably supported in the casing by guides or tracks **25** and **26** secured to the inner surfaces of the top and bottom walls **10***b* and **10***c*, respectively, and defining grooves into which the top and bottom ends of the panel **24** fit.

The panel **24** supports a plurality of electric lamps **27** arranged in two rows projecting from opposite sides of the panel **24**. It is desirable that these lamps be positioned very closely together, and to this end each consists only of a glass envelope having a substantially spherical portion and a stem portion, the stem portions projecting through an arcuate slot **24***a* provided in the channel **24** and being secured in place by a suitable cementing material **29**.

As shown in Fig. 7, each lamp **27** has a filament **27***a* that is preferably either straight or only slightly curved and lies substantially in an axis transverse to the tip of the lamp, so that by suitably orienting each lamp before cementing it in place the filament then can be placed in alignment or approximate alignment with one of the stencils and the window **11**, so that the lamp when illuminated casts a sharp image of the stencil on the window. As is well known, a small light source casts a sharper image than a large light source. It is for this reason that the lamps are positioned with their filaments in alignment with the associated stencil and the window **11**, so that the projection of the filament in a plane normal to the direction of the window is of minimum size.

In the structure shown, the distance from the center of each symbol transparency to the center of the window is the same; and the transparencies are in planes parallel to the window, and the distance from each light source to the center of the window is the same. By these means regularly and equally sized and shaped symbols are formed on the window from regularly and equally sized transparencies.

From observation of Figs. 3 and 4, it will be observed that the lamps in the two rows on opposite sides of the panel **24** are staggered in relation corresponding to the

staggering of associated stencils. This facilitates close positioning of the lamps to each other, so that a large number of symbols can be displayed in a relatively small volume. In the embodiment shown, there are ten lamps and ten stencils permitting the display of any one of the numerals 0 to 9, inclusive.

Referring to Fig. 6, the ten lamps are shown with the filament of each connected to a common ground at one end and connected by separate leads in a cable **35** to separate contacts of a selector switch **36**, the latter having a movable contact element **36*a*** whereby a circuit can be completed from ground through a current source **37** to any one of the lamps, so that by simply manipulating the switch **36*a*** any lamp can be illuminated to display the associated numeral on the window **11**.

An advantage of the particular construction shown is that it permits the use of a casing **10** having a very narrow dimension substantially no greater than that of the display window **11** thereof, so that a large number of the units can be positioned side by side to display simultaneously all the digits of a multidigit number, each unit showing only one digit.

Although for the purpose of explaining the invention, a particular embodiment thereof has been shown and described, obvious modifications will occur to a person skilled in the art, and I do not desire to be limited to the exact details shown and described.

I claim:

1. A luminous indicator comprising: a lighttight casing having a front wall containing a translucent window; a plurality of different symbol transparencies and means supporting them in said casing in closely spaced relation approximately in a common transverse row back of and parallel to said window; a plurality of lamps adapted to be separately energized and means supporting them in said casing approximately in a common transverse plane back of and parallel to said plane of said transparencies; each lamp being so positioned and having a light-emitting filament so small relative to said transparencies as to approximate a point source of light laterally positioned in alignment with the center of an associated transparency and the center of said window, each transparency being so longitudinally positioned and so dimensioned relative to said window that the shadow image cast on said window by its associated lamp substantially fills said window and consisting of a self-supporting thin sheet stencil defining a symbol, a portion of said stencils being in one row, and the remainder of said stencils being in a second row parallel to the first row, and the associated lamps being in two generally parallel rows back of their associated stencils; each lamp comprising a glass bulb having a generally spherical filament-enclosing portion and a lead-in stem portion projecting from said spherical portion; a lamp-supporting strip mounted in said casing in the median plane between said two rows of lamps, said strip having a longitudinal slot therein into which the stem portions of the lamps in the two rows extend from opposite sides, the lamps in said two rows being staggered relative to each other and the spherical portions of adjacent lamp bulbs in each row being substantially in contact with each other; and means adherent to said bulb stems and strip for anchoring said bulbs to said strip.

2. An indicator according to claim 1 including a stencil-supporting strip aligned with said lamp-supporting strip and extending forwardly therefrom to the said transverse rows of stencils and constituting said lamp-supporting strip a light barrier between each row of lamps and the stencils associated with the other row of lamps.

3. An indicator according to claim 2 in which each row of stencils consists of an integral sheet assembly comprising a flat base portion positioned against and secured to one face of said stencil-supporting strip, and stencil portions extending at right angles from the forward edge of the base portion.

4. An indicator according to claim 3 in which said forward edge of each base portion comprises a plurality of stepped sections, one for each stencil portion, each section being parallel to the others, but sections other than the center one being progressively forwardly displaced.

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