Sept. 1, 1936. V. E. CARBONARA 2,052,751

ANNUNCIATOR

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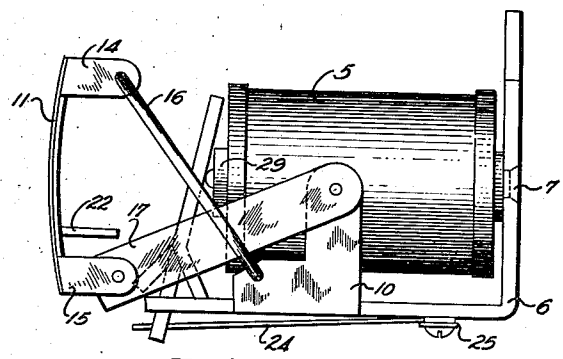



Fig. 1.

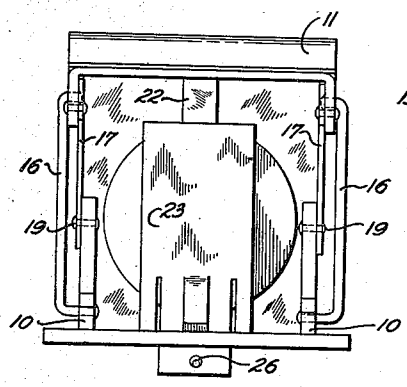



Fig. 3.

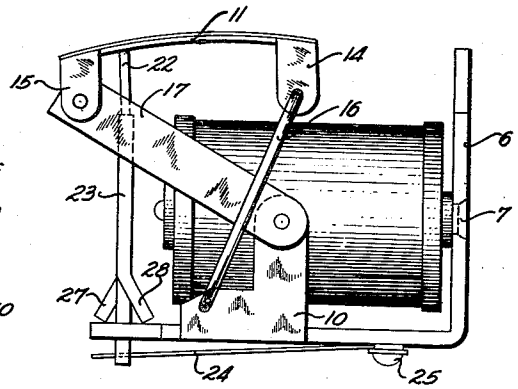



Fig. 2.

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## ANNUNCIATOR

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4 Claims. (Cl. 177—329)

This invention relates to annunciators, and more particularly to annunciators of the electro-magnetically actuated type adapted to produce a visual or audible signal.

An object of the invention is to provide, in an annunciator of the foregoing type, novel means for positively maintaining the electro-magnetically actuated member out of signal displaying position until movement thereof is produced by operation of the control means provided for such purpose.

A further object is to provide novel means for rendering the electro-magnetically actuated member immune from the possibility of being shaken or jarred into signal producing position.

It has been found that in signalling apparatus of the type employing annunciator drops or shutters, the movable parts are sometimes prevented by gravity from moving out of their normal positions into signal displaying position, particularly when such drops are mounted on conveyances such as trains or ships, wherein there is a possibility of sway or list, which shifts the center of gravity of the annunciator, and hence the gravity moment of the parts.

The present invention eliminates this objection by providing an annunciator of novel construction in which the gravity moment is sufficient to cause proper operation of the parts, even though the device is tilted to an extreme degree, this being effected by the use of a novel method.

A further object of the invention is the provision of novel means for positioning and controlling the moving parts of an annunciator so as to permit of a substantial reduction in the overall dimensions of the annunciator assembly without decreasing the strength or size of any of the parts.

Another object of the invention is the provision, in a device of the foregoing character, of a novel signal producing element movable by gravity into signal producing position in response to operation of electro-magnetic means, said element being so mounted and disposed as to tend to remain in such position by virtue of its own gravity moment, and being returnable to inactive position only upon positive operation of the restoring means provided for the purpose.

A further object of the invention is to provide a novel signal element of the foregoing type in conjunction with novel means for holding the same in inactive position, and for rendering it secure against any movement from such position until release of said holding means.

A further object of the invention is to provide in an annunciator of the type employing a drop or shutter adapted to swing through an arc of approximately ninety degrees in moving from active to inactive position, novel pivoting means for said drop whereby the length of the arc traversed by the end portions thereof is materially less than that traversed by the central portion, and a consequent saving in the space required between centers of adjacent units is effected.

These and other objects of the invention will become apparent from an inspection of the following specification, reference being had to the accompanying drawing wherein the preferred embodiment of the invention is illustrated. It is to be understood, however, that the drawing is merely illustrative of the invention and is not designed as a definition of the limits thereof, reference being had for this purpose to the appended claims.

In the drawing,

Fig. 1 is a view in elevation of a device embodying the invention;

Fig. 2 is a view in elevation showing the parts in the restored or inactive position; and

Fig. 3 is an elevation view taken at right angles to the viewpoint of Fig. 2.

Referring to the drawing, it will be seen that the annunciator in which the invention is shown embodied comprises an electro-magnet 5 stationarily mounted on a suitable support such as the bracket or frame 6, it being understood that a plurality of such electro-magnets are mounted in adjacent positions on extensions of the bracket 6 or on similar mounting means, the whole being preferably enclosed within a casing or mounted on a suitable panel (not shown), to permit observation of the various signals displayed on such casing or panel. Reference character 7 indicates suitable means for attaching electro-magnet 5 to the bracket 6, the latter being provided with a pair of vertically disposed supporting members 10 for a purpose to be described.

The signalling element may be of any suitable form and material, but, as shown, comprises a drop or shutter 11 on the outer surface of which is imprinted, or otherwise affixed, a character or legend constituting the signal intended to be displayed. The member 11 is provided with rearwardly extending ears or lugs 14 and 15, provided near their ends with apertures for a purpose now to be described.

Novel mounting means are provided for the shutter 11 whereby different portions of the surface of the said shutter are caused to traverse arcs of different lengths and radii, and described

about different centers. As shown, such means preferably comprises the provision of two sets of diagonally disposed pivotal links, there being one set on either side of the shutter 11 and each set comprising a link 16 extending from one of the upper ears 14 of the shutter to a suitable aperture in the corresponding support 10, the said links 16 being adapted to cross associated links 17, the latter being of relatively heavy weight and pivoted at their outer ends to the ears 15 of the shutter 11 and at their inner ends to the pivots 19 provided on the supports 10. From examination of Figs. 1 and 2 it will be seen that these links 16 and 17 are so disposed with respect to the shutter 11 that upon movement of the shutter from one position to the other, each link describes a different arc, each of which arcs is approximately forty-five degrees in length, with the result that shutter 11 assumes a ninety-degree change in position but moves in a path having a variable radius, the resultant of which is considerably less than that of either of the links 16 and 17. By this means it is possible to mount adjacent units of the annunciator in vertical alignment and with their centers considerably closer to one another than is possible in constructions wherein the shutter 11 swings through a ninety-degree arc about a single center and radius line perpendicular thereto. Moreover, the relatively heavy weight, coupled with the angular position of links 17, insures positive gravity operation of the shutter even though the device is tilted backwardly to an extreme degree.

The novel means for holding the shutter 11 in the inactive position, shown in Fig. 2, and for producing a movement thereof to the active or signal displaying position, as shown in Fig. 1, comprises the provision of a downwardly extended leg or guide member 22 normally resting on the upper surface of a vertically disposed armature 23 which thereby constitutes a combined armature and support for the shutter 11.

As shown, the armature 23 is of novel construction and is provided with novel control means tending to maintain it in the true vertical position. As shown in Fig. 2, such control means comprising a resilient finger or spring 24 affixed by suitable means 25 to the bracket 6 at one end thereof, and extending downwardly from said bracket in cantilever fashion, and passing through a suitable aperture 26 in the lower end of armature 23. It is apparent from the foregoing that the spring 24 exerts a resilient force tending to maintain the armature 23 in the vertical position, in which function the spring is assisted by the obliquely and laterally disposed toe pieces or tongues 27 and 28 resting on the surface of the bracket 6, and thereby aiding in maintaining the armature in the position shown in Fig. 2, in which position any movement of the shutter 11 is prevented.

Were it not for the leg 22, the shutter 11 would be moved by gravity into signal displaying position, since (as above explained) the center of gravity of the assembly constituted by the links 16 and 17 and the shutter is to the left of the support 10. In a sense, however, gravity also tends to hold the parts in the inactive position, since it acts through leg 22 to hold the shutter firmly supported by the armature 23.

When it is desired to display the signal constituted by the shutter 11, the electro-magnet 5 is caused to be energized by closure of a suitable switch controlling the circuit thereto. Upon being thus energized, the magnet is effective to draw the armature 23 inwardly toward the core 29 thereof, and into the position shown in Fig. 1. Such inward movement of the armature occurs in opposition to the tendency of spring 24, and causes a withdrawal of the supporting means from the leg 22, thereby producing a downward descent of the shutter assembly into the signal displaying position shown in Fig. 1, such descent being caused by the gravitational effect produced by the unbalanced condition resulting from withdrawal of the armature 23 as a support for the leg 22.

It will be understood, of course, that only a momentary energizing of the electro-magnet 5 is necessary to produce the action just described. It is further to be understood that suitable means may be employed,—either mechanical or electro-magnetic—for returning the drop to the inactive position, and that upon such return it will again be supported by action of the armature 23, which has in the meantime returned to the vertical position through the action of the centering spring 24.

It will be apparent from the foregoing description that there has been disclosed herein an annunciator unit of novel construction in which the parts are arranged in an efficient manner to produce economy of space and certainty of operation irrespective of the attitude of the unit as a whole, or of the vessel in which it is installed. Although the invention has been described with reference to an annunciator of the type in which the signal is affixed directly to a shutter operable in response to movement of an electro-magnetically controlled armature, it is to be understood that the invention may be embodied in an annunciator of the type employing electric indicators such as miniature incandescent lamps, the circuits to which are controlled by movement of suitable switches, which may be substituted for the shutters 11, to alternately make and break such circuits.

Likewise, other changes may be made in the construction, method of operation and application of the parts without departing from the scope of the invention as disclosed herein and as defined in the appended claims.

What is claimed is:

1. In combination with a signal element of the type movable from a normally non-displaying position to signal displaying position, a support, means comprising a link mechanism pivotally mounting said element on said support for causing a movement of said element from either of its positions to the other in such a manner that during such movement the central portion of said element traverses an arc greater in length than that traversed by said link mechanism, means for preventing movement of said element to the displaying position, and electro-magnetic means carried by said support for withdrawing said preventing means to permit movement of said element into the displaying position.

2. In apparatus of the class described, a frame, an electro-magnet carried thereby, an armature for the electro-magnet, a signal element having a laterally projecting tongue adapted to engage said armature, means including crossed links pivotally connecting the signal element to the frame for causing a movement of said element from a non-displaying position to a signal displaying position and vice versa in such a manner that said element is confined during such movement within a space defined by an arc hav-

ing a radius smaller than the radius of any of the arcs traversed by said links, and yielding means normally holding said armature in engagement with said tongue.

3. In a device of the class described including a signal element and a member normally supporting said signal element in a non-displaying position, the combination of a support, a plurality of links pivotally supporting said signal element on said support, means for positioning said links with respect to said signal element in such a manner as to produce a substantially ninety degree change in the disposition of said signal element by movement of said links through different arcs of considerably smaller length than that traversed by said element, thereby confining the movement of said signal element within a space defined by an arc having a smaller radius than the radius of any of the arcs traversed by said links, and means carried by said support for actuating said element whereby said links move it into signal displaying position.

4. An annunciator unit comprising a signal element adapted for movement from a normally non-displaying position to signal displaying position, a supporting frame, a member pivoted on said frame for supporting said element in a non-displaying position, means including a plurality of links pivotally connected to said frame and to said signal element at both ends thereof for causing a movement of said element from either of its positions to the other in such a manner as to produce a substantially ninety degree change in the disposition of said signal element by angular movement of said links of less than ninety degrees, and means carried by said frame for tripping the supporting member whereby said signal element is actuated into displaying position.

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