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LIGHT SIGNAL APPARATUS

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Fig. 1.

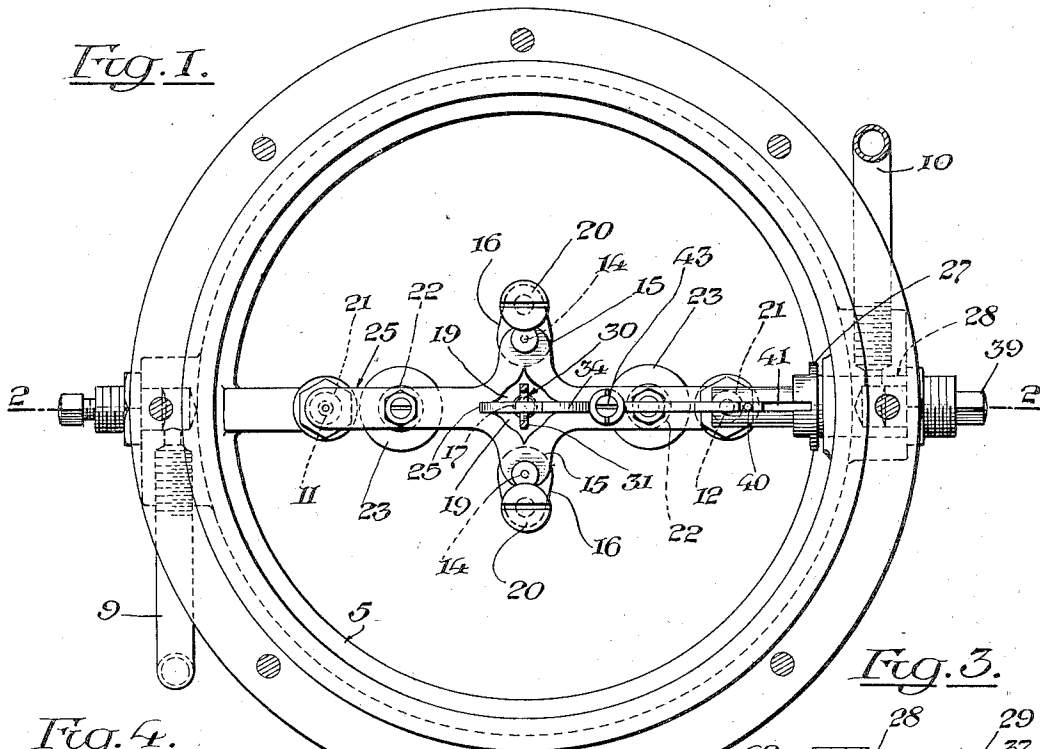


Fig. 3.

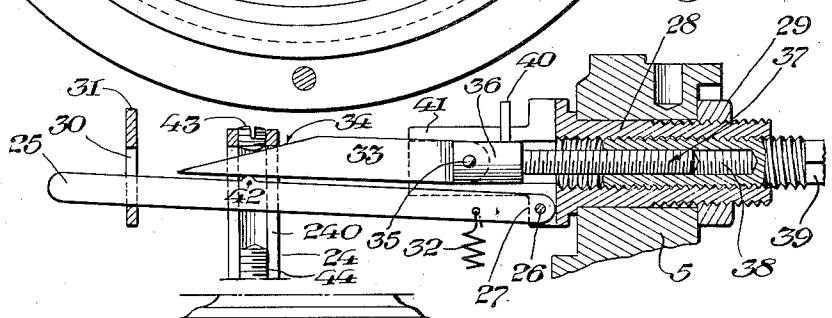


Fig. 4.

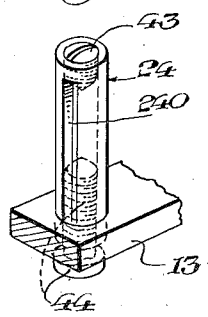
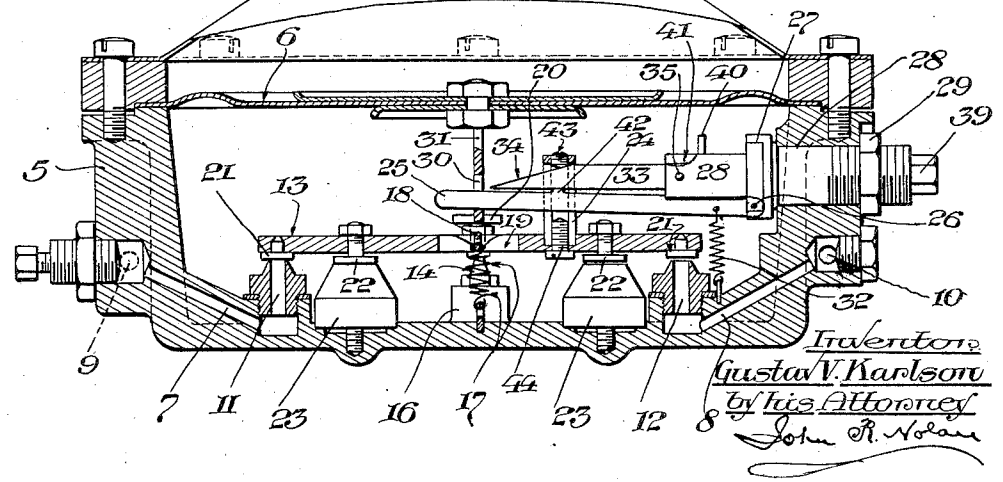


Fig. 2.



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LIGHT SIGNAL APPARATUS

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5 Claims. (Cl. 67—111)

This invention relates to light signal apparatus for life buoys and the like, having reference to that class of apparatus wherein is employed a gas chamber having inlet and outlet ports equipped with valve controlling mechanism, including a member under the influence of a magnet or magnets, whereby when the apparatus is in service said member is intermittently actuated in a manner to open and close the ports in alternation and thereby permit the supply of illuminating gas to the chamber through one port and its delivery therefrom through the other port to a suitable burner, thus effecting the lighting and the extinguishing of the burner flame at predetermined intervals of time to produce periodic light flashes.

The object of my invention is to provide simple and durable means for efficiently opening and closing the valve ports, which means is of such character that it can be nicely adjusted to vary the lengths of the consecutive light flashes as occasion may require, as will be hereinafter described, the scope of the invention being expressed in the appended claims.

In the drawing—

Figure 1 is a sectional plan of an apparatus embodying my invention, the diaphragm being removed from the casing.

Fig. 2 is a transverse vertical section, as on the line 2—2 of Fig. 1, showing the valve lever and its actuating parts in their relative positions during a relatively short light period.

Fig. 3 is an enlarged section through a portion of one side of the casing showing the adjusting devices for the regulating wedge bar which varies the lost motion between the lifting bar and the lever valve to determine the length of the light period.

Fig. 4 is a fragmentary perspective view of the slotted coupling post on the lever valve.

Referring to the drawing, 5 designates the usual casing having a closure diaphragm 6 influenced by the volume of gas contained in the chamber constituted by the casing. The wall of the casing is provided with suitably-disposed ingress and egress ports 7 and 8, respectively, the port 7 being in communication with a gas line, as 9, and the port 8 in communication with a pipe 10 connected with a signal burner, as usual. The inner ends of the ports 7 and 8 lead to spaced nipples 11 and 12, respectively, secured at diametrically opposite points on the bottom of the casing, which nipples are adapted to be opened and closed in alternation by an oscillatory lever valve 13 in order to permit the ingress and egress

of the gas to and from the chamber at predetermined intervals.

The valve 13 is fulcrumed midway of its ends upon upstanding cone points 14, which are entered in conical sockets in the undersides of lateral projections 15 of the valve. These cone points are conveniently secured to bosses 16 on the floor of the casing. The valve is flexibly held on its fulcrum points by means of a suitable spring 17 which is attached to the floor of the casing and to a cross piece 18 supported in a central opening 19 in the valve; and suitably disposed means, such as cap screws 20, are mounted in the bosses 16 so as to overhang the respective lever projections adjacent the points 14 so as to limit the upward movement of the valve.

The respective arms of the lever valve are provided on their under sides, adjacent their ends, with cover pieces 21 which overhang the openings of the respective nozzles, and by actuation of the valve are caused to open and close the openings of the nozzles in alternation.

The valve arms are also provided on their undersides with adjustable armatures 22 which overhang up-standing permanent magnets 23 fixed on the bottom of the casing, which armatures are oscillated by the valve in opposition to the attraction of the magnets.

Rising from the valve arm which overhangs the egress nipple 12 is a vertically-slotted post 24, constituting a coupling member, through the slot 240 of which slidably extends the free end of a lifting bar 25 disposed longitudinally of the valve. The opposite end of this bar 25 is pivoted for vertical oscillation, as at 26, in a vertically slotted projection 27 on a sleeve 28 which extends through the wall of the casing and is fixed thereto by a lock nut 29 on the threaded outer end of the sleeve. The free end of the lifting bar 25 projects through a vertical slot 30 in a member 31 depending centrally from the diaphragm 6. This bar is resiliently held in down position by a spring 32 which is secured thereto and to the bottom of the casing, and hence when the diaphragm is raised and lowered by the pressure and the reduction of the pressure, respectively, of the gas within the casing, the valve 13 is oscillated to close one of the ports and open the other, and so on in alternation, the opening of each port being in opposition to the attractive force of the adjacent magnet.

According to my invention I provide a simple and efficient means for varying the upward movement of the bar 25 by the diaphragm actuated member 31, and accordingly varying the extent

of the upward movement of the valve arm above the egress port of the nipple 12 in a manner to vary the length of the light period within predetermined limits.

5 This regulating means comprises a bar 33 superimposed on and longitudinally of the bar 25 and having at its inner or free end a wedge-portion 34 slidable in the slot of the post 24. The opposite end of the bar 33 is pivoted, as at 35, in
10 and between the walls of a slotted head 36 fast on one end of a stem 37 which is threaded in the bore of a sleeve 38 so as to be adjustably mountable therein and also longitudinally movable therewith. The sleeve 38, in turn, is threaded in
15 the bore of the fixed sleeve 28 previously referred to.

The outer end of the sleeve 38 is formed with a nut head 39 effective to facilitate the longitudinal adjustment of such sleeve and its pivoted
20 wedge bar 33.

A radial pin 40 fixed to the head 36 and extending slidably through a longitudinal slot 41 in the inner projecting portion of the sleeve 28 prevents rotation of the stem 37 and insures its
25 rectilinear motion when the encircling sleeve 38 is actuated to adjust the wedge of the bar 33 in relation to the slot in the post 24 so as nicely to vary and determine the extent of lost motion of the bar 25 in said slot and thus vary the period
30 of the light flash.

In order to minimize the opposing frictional surfaces of the bars 25 and 33 on account of their slightly varying angular relations incident to their oscillatory motions, I provide the upper surfaces
35 of the bar 25 with a rounded protuberance 42 upon which the free end portion of the wedge bar 33 is rockably supported; and in order to procure with facility a definite and precise length of the slot in the post 24, the upper and lower
40 ends of the post are vertically bored and threaded to receive upper and lower contact screws 43 and 44 for the opposing edges of the respective bars 25 and 33, the screw 44 also serving as a
45 means to secure the lower end of the post in a socket in the lever valve.

I claim—

1. In a light signal apparatus, a casing constituting a chamber and having gas ingress and egress ports, whereof the egress port is in communication with a burner, a diaphragm closure
50 for said chamber, an oscillatory valve within said chamber for opening and closing said ports in alternation, and means under the influence of the diaphragm for operating said valve, said
55 means including a member carried by said diaphragm, a coupling member on said valve, an oscillatory valve-lifting bar extending longitudinally of said valve and associated with said members to afford limited relative motion between the bar and the members in the direction of movement of the diaphragm, an oscillatory flash-regulating bar having a wedge-portion in co-operative relation to the coupling member, said latter bar superimposed on the lifting bar and extending
60 longitudinally thereof, and means for longitudinally moving said flash-regulating bar to adjust its wedge-portion in respect to the coupling member.

2. In a light signal apparatus, a casing constituting a chamber and having gas ingress and egress ports, whereof the egress port is in communication with a burner, a diaphragm closure
70 for said chamber, an oscillatory valve within said chamber for opening and closing said ports in alternation, and means under the influence of

the diaphragm for operating said valve, said means including a member carried by said diaphragm, a coupling member on said valve, an oscillatory valve-lifting bar extending longitudinally of said valve and associated with said members to afford limited relative motion between the bar and the members in the direction of movement of the diaphragm, an oscillatory flash-regulating bar having a wedge-portion in co-operative relation to the coupling member, said
10 lifting bar having a protuberance on its upper edge and said flash-regulating bar rockably supported on said protuberance and extending longitudinally of the lifting bar, and means for longitudinally moving said flash-regulating bar to
15 adjust its wedge-portion in respect to the coupling member.

3. In a light signal apparatus, a casing constituting a chamber and having gas ingress and egress ports, whereof the egress port is in communication with a burner, a diaphragm closure
20 for said chamber, an oscillatory valve within said chamber for opening and closing said ports in alternation, and means under the influence of the diaphragm for operating said valve, said means
25 including a member carried by said diaphragm, a coupling member on said valve comprising a longitudinally slotted post and a screw which defines the upper end of the slot, an oscillatory valve-lifting bar extending longitudinally of said
30 valve and associated with said members to afford limited relative motion between the bar and the members in the direction of movement of the diaphragm, an oscillatory flash-regulating bar having a wedge-portion in co-operative relation
35 to the coupling member, said latter bar superimposed on the lifting bar and extending longitudinally thereof, and means for longitudinally moving said flash-regulating bar to adjust its wedge-portion in respect to the coupling member.

4. In a light signal apparatus, a casing constituting a chamber and having gas ingress and egress ports, whereof the egress port is in communication with a burner, a diaphragm closure
45 for said chamber, an oscillatory valve within said chamber for opening and closing said ports in alternation, and means under the influence of the diaphragm for operating said valve, said means
50 including a member carried by said diaphragm, a coupling member on said valve comprising a longitudinally slotted post and screws which define the upper and lower ends of the slot, the lower screw also securing the post to the valve, an oscillatory valve-lifting bar extending
55 longitudinally of said valve and associated with said members to afford limited relative motion between the bar and the members in the direction of movement of the diaphragm, an oscillatory flash-regulating bar having a wedge-portion in co-operative
60 relation to the coupling member, said latter bar superimposed on the lifting bar and extending longitudinally thereof, and means for longitudinally moving said flash-regulating bar to adjust its wedge-portion in respect to the coupling member.

5. In a light signal apparatus, a casing constituting a chamber and having gas ingress and egress ports, whereof the egress port is in communication with a burner, a diaphragm closure
70 for said chamber, an oscillatory valve within said chamber for opening and closing said ports in alternation, and means under the influence of the diaphragm for operating said valve, said means including a member carried by said diaphragm, a coupling member on said valve, an os-
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5 cillatory valve-lifting bar extending longitudinally of said valve and associated with said members to afford limited relative motion between the bar and the members in the direction of movement
10 of the diaphragm, an oscillatory flash-regulating bar having a wedge-portion in co-operative relation to the coupling member, said latter bar superimposed on the lifting bar and extending longitudinally thereof, and means for longitudinally moving said flash-regulating bar to adjust

its wedge-portion in respect to the coupling member, said last-named means including a sleeve fixed in the wall of the casing and having an inwardly extending slotted portion, an inner sleeve threaded for longitudinal adjustment in said fixed sleeve, a stem threaded in said sleeve and having a terminal to which the flash-regulating bar is pivoted, and also having a projection guided in the slot of the fixed sleeve. 5

GUSTAV VICTOR KARLSON. 10