May 19, 1953 M. SESERA 2,639,106

AUTOMATIC SIGNAL FLARE AND MARKER BUOY

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Fig. 1.

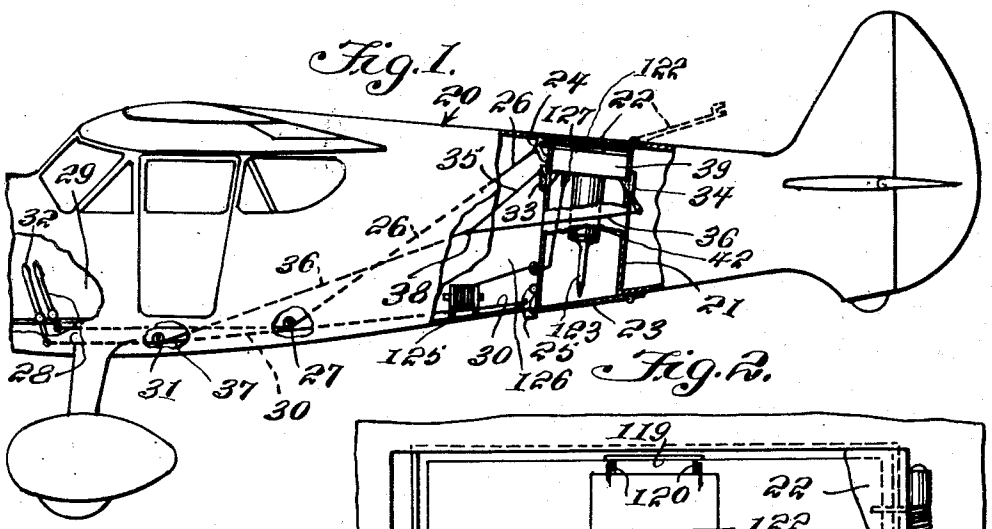


Fig. 2.

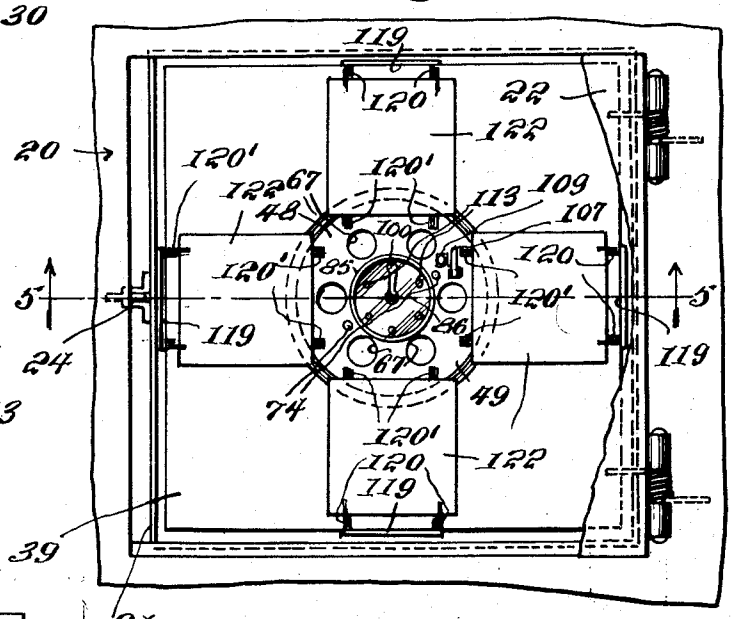


Fig. 12.

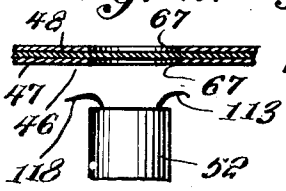


Fig. 3.

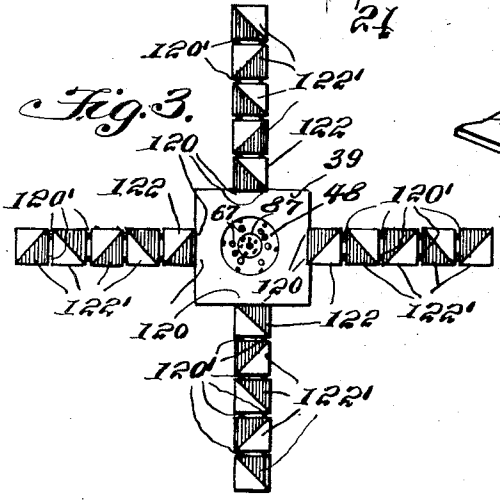
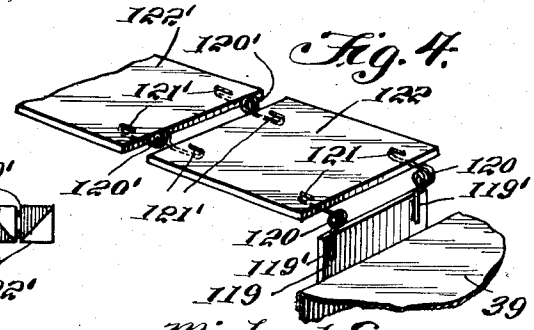


Fig. 4.



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Fig. 5.

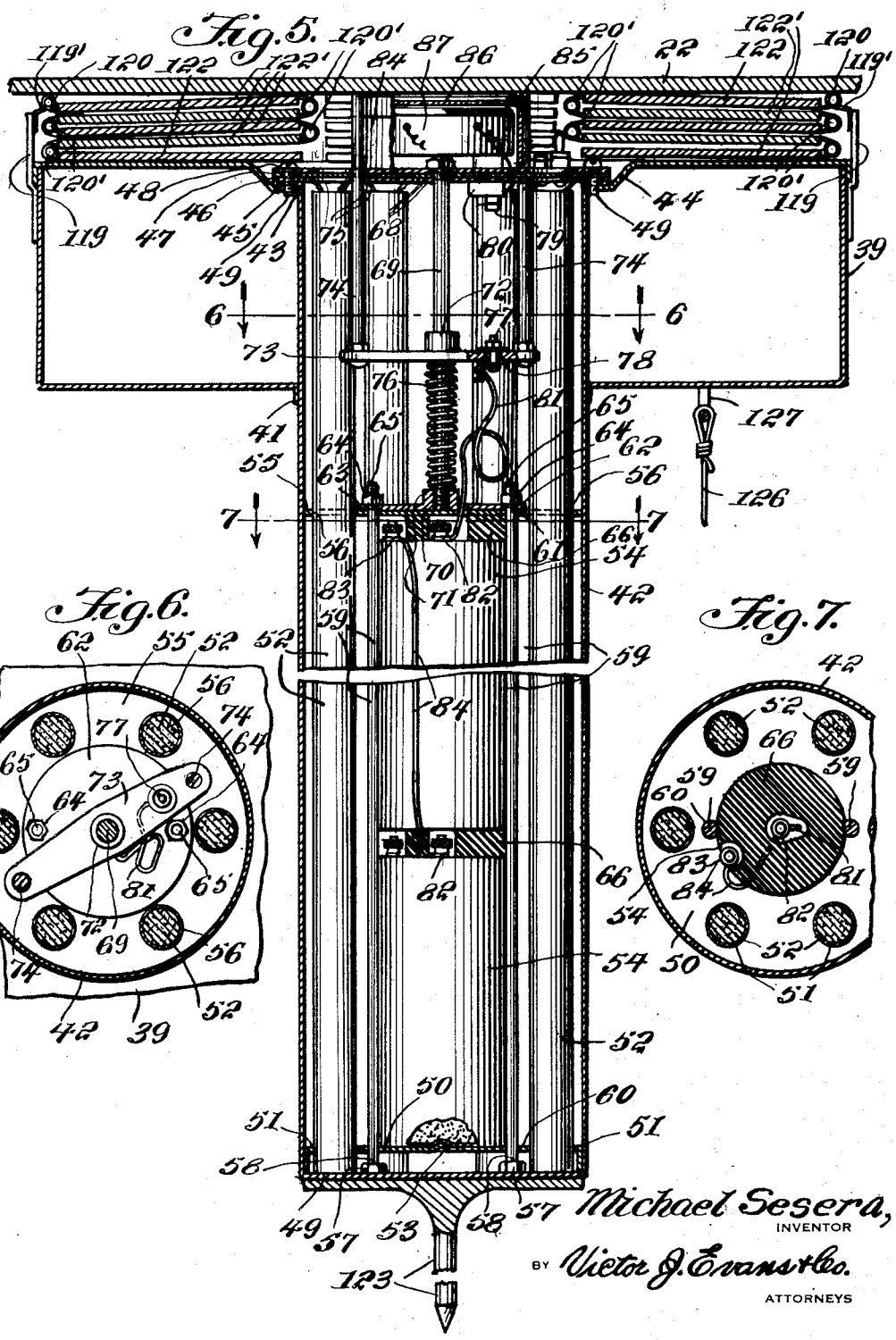


Fig. 6.

Fig. 7.

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Fig. 8.

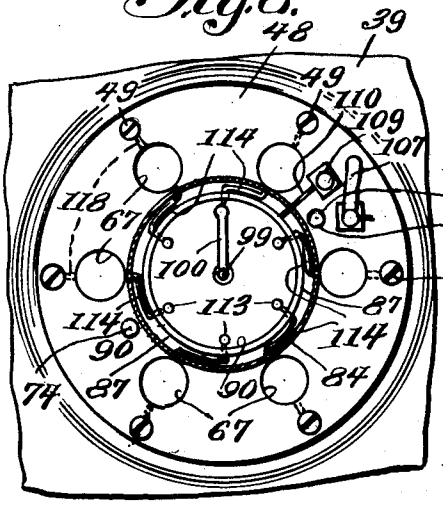


Fig. 9.

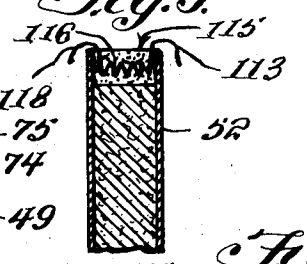


Fig. 10.

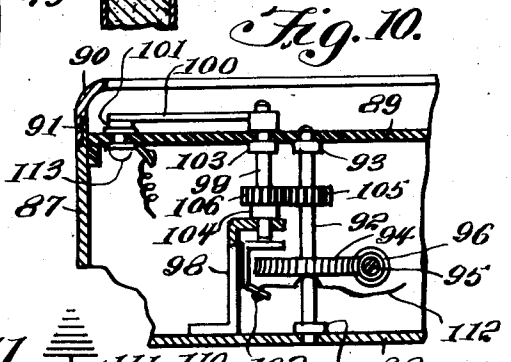
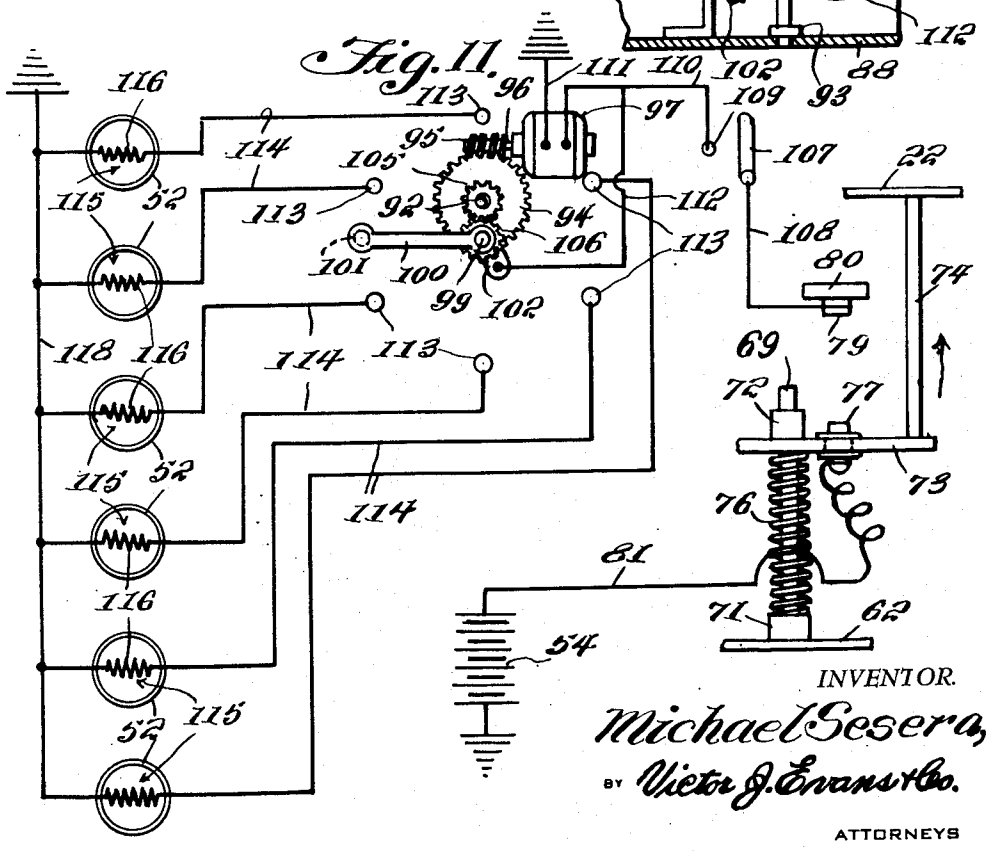


Fig. 11.



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AUTOMATIC SIGNAL FLARE AND MARKER BUOY

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Application July 15, 1949, Serial No. 104,907

5 Claims. (Cl. 244—1)

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This invention relates to improvements in automatic signal flares and marker buoys and more particularly to self contained devices that are adapted to be used for aerial and marine use.

For aerial use, a compartment is provided in the fuselage of an airplane in which the signal flare and marker buoy is positioned. The compartment is provided with spring actuated doors which controlled from a position near the pilot can be opened to permit the device to emerge from the compartment.

The device being arranged so that it is provided with a water-tight body that will float upon contact of the fuselage of the airplane with the surface of the water with the top of the device above the surface of the water.

The device being provided with means for supporting the same in a vertical position upon contact with the ground surface can be dropped from the airplane to engage the ground prior to the crash of the airplane.

For marine use a container can be placed on the deck of a large or small vessel and provided with a cover that can be opened will float as the vessel submerges.

An important object of the device therefore is to provide a marker which is susceptible of being seen by night or day, and by its operation permit a vessel or airplane to be located without the necessity of radio direction signals.

Radio signals are usually given just prior to the catastrophe, and if the radio is then damaged, the device will enable another vessel or airplane to locate the wreckage.

In this manner lives will be saved and property salvaged, since the device will definitely locate the vessel or airplane upon which it is installed.

Another object of the invention is to provide a device which will insure proper ignition or lighting of the flares at predetermined intervals without further effort on the part of any survivors of the crash or sinking.

A further object of the invention is to provide a device which is safe to handle, durable, and composed of few parts, will not become easily damaged once it has been installed.

With the above and other objects and advantages in view, the invention consists of the novel features of construction, arrangement and combination of parts as will be hereinafter more fully described in detail and illustrated in the accompanying drawings which form a part of the application and in which:

Fig. 1 is an elevational view of an airplane partly broken away to show the manner of installation of an embodiment of the invention.

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Fig. 2 is a top plan view of the installation of Fig. 1 with the cover partly broken away to view the top of the device positioned therein.

Fig. 3 is a top plan view of the device with the markers fully extended to show their position when the device is in operation either on land or on the water.

Fig. 4 is a detailed perspective view of a section of one of the markers.

Fig. 5 is a vertical sectional view of the device on the line 5—5 of Fig. 2.

Fig. 6 is a horizontal sectional view of the device on the line 6—6 of Fig. 5.

Fig. 7 is the same on the line 7—7 of Fig. 5.

Fig. 8 is a detailed top plan view of the actuating mechanism for igniting the flares.

Fig. 9 is a detailed sectional view of the "squib" for igniting the flare.

Fig. 10 is a detailed fragmentary view of the timing mechanism for the ignition of the flares.

Fig. 11 is a diagrammatic view of the electrical system and timing mechanism for controlling the flares, and

Fig. 12 is a detailed sectional view of the top construction of the flare container of the device.

Referring more in detail to the drawings an embodiment of the invention is shown and described for aerial use.

In Fig. 1 there is shown a conventional showing of an airship 20 and it is to be understood that such showing is merely illustrated, and not restricted in its scope.

To position the device in the fuselage of the airship 20 a compartment or container 21 of a light weight noncombustible material is used. The container 21 will extend entirely through the fuselage permitting egress of the device either through the top or bottom thereof.

The container 21 is provided at the top and bottom thereof with hinged covers or doors 22 and 23 respectively and a cover or door 22 is retained in closed position by a pivoted latch 24. The cover or door 23 being retained in closed position by a pivoted latch 25.

The latch 24 is controlled in its operation by a cable 26 which passing over a sheave 27 is connected to the pivoted lever 28 mounted in a position within reach of the pilot seat 29. It will be seen that movement of lever 28 will cause the cable to pivot the latch 24 to release the cover or door 22 which by its spring actuating hinges 220 as shown in Fig. 2 will immediately move into open position as shown by dotted lines in Fig. 1.

In like manner the latch 25 is controlled in its operation by a cable 30 which passing over a sheave 31 is connected to the pivoted lever 32

mounted adjacent the lever 28 and within the reach of the pilot seat 29. In this instance however, the device will not emerge from the container 21 upon operation of the door 23 alone. The device being retained in the container 21 by pivoted keepers 33 and 34 respectively as shown in Fig. 1. To the keeper 33 there is connected a control cable 35 and to the keeper 34 there is connected a control cable 36. The cable 36 is connected to the cable 30 at 37 and the cable 35 is connected to the cable 36 at 38. Thus upon movement of the lever 32 the cable 30 will be actuated. The cable 30 connected to cable 36 will cause simultaneous operation of cables 35 and 36 to actuate the pivoted keepers 33 and 34 at the same time that latch 25 is released from its engagement with the door 23 thus as the door 23 opens and the keepers 33 and 34 are actuated the device will drop outwardly of the container 21 for the purpose to be later described.

Viewing Fig. 5 it will be seen that the embodiment of the invention to be later described comprises a hollow non-combustible buoyant body 39. The bottom 40 of the body is provided with a centrally located flanged opening 41 through which passes a hollow non-combustible flare containing portion 42. The flanged opening 41 being fixed to the portion in any well known manner.

The top of the body 39 is provided with an opening 43 which is provided with a concentric inset flange 44 which is adapted to receive the out-turned flange end 45 of the portion 42.

Within the inset flange 44 there is provided a non-combustible disc 46 on top of which is placed a frangible disc 47, on this disc 47 is placed a non-combustible disc 48, and all the discs are fixed to the flange 44 in water tight relation thereto by fasteners 49.

The purpose of this construction will be later described.

The portion 42 may be of any length desired and the body 39 will have sufficient buoyancy to support the portion 42 and its contents so that the top of the body will be above water level.

Fixed in the closed bottom 49 of the portion 42 is a flange disc 50 which is provided with a plurality of concentrically located openings 51 in which is received the lower ends of the flares 52.

The center of the disc 50 is provided with a protuberance 53 which is adapted to engage the bottom of the lowermost dry cell 54. As many dry cells as are desired are located in the portion 42. At the top of the uppermost dry cell 54 there is the disc 55. The disc 55 is provided with the same number of openings 56 as is the disc 50 with the openings 51 and the flares 52 passing upwardly through the disc 55.

Fixed to the bottom 49 of the portion 42 are the nuts 57 which removably receive the threaded ends 58 of the rods 59. The rods 59 extend upwardly within the portion 42 in contact with the dry cells 54. Openings 60 in the disc 50 and openings 61 in the disc 55 permit the extension of the rods there through.

On the disc 55 there is positioned a circular plate 62 having opening 63 to receive the upper ends of the rods 59. Nuts 64 on the upper threaded ends 65 of the rods 59 will when tightened urge the plate 62 and disc 55 downwardly on the rods 59.

Between the dry cells and the disc 55 in contact with the dry cells 54 are the non-conducting compressible members 66. Thus when the nuts 64 are tightened the dry cells by means of the protuberance 53 and members 66 will be retained in the portion 42 within the rods 59.

The discs 46 and 48 are provided with the same number of openings 67 as are the discs 50 and 56 and the flares extend upwardly to meet in a short distance of these openings. The disc 47 however does not have openings, and thus the disc 47 will prevent water from entering the portion 42 through the openings 67.

The discs 46, 47 and 48 are each provided with a central opening 68 through which the guide rod 69 extends. The rod 69 at its lower threaded end 70 being received in the tapped boss 71 at the center of the plate 62.

Slidably mounted on the rod 69 by means of the flange openings 72 is the plunger 73. Fixed to each end of the plunger 73 is an upwardly extending guide rod 74 which extending upwardly through openings 75 in disc 46, 47 and 48 will abut the cover or door 22. Such abutment being achieved by the medium of the coil spring 76 sleeved on the rod 69 intermediate of the boss 71 on the plate 62 and the under surface of the plunger 73. The spring 76 urging the rod 74 upwardly against the cover will when the cover is opened cause the plunger 73 to move upwardly carrying the contact 77 carried by the plunger 73 and insulated therefrom by non-conducting sleeve 78 to engage the contact 79 carried on the undersurface of the disc 46. The contact being insulated from the disc by means of the non-conducting means 80.

It will be noted that a wire 81 connects the contact 79 with the plus pole 82 of the upper most dry cell 54. From then on the dry cells are connected in series with the minus pole 83 of the uppermost dry cell being connected to the plus pole of the next dry cell by a wire 84, and so on to the last dry cell. The protuberance 53 engaging the metal container of the last dry cell acts as a ground contact for the circuit with the portion 42 forming the ground for the circuit.

Fixed to the uppermost disc 48 centrally thereof is a housing 84 having a removable cover 85 thereon carrying a glass face 86. Within this housing 84 is a casing 87 for a time controlled flare igniting mechanism.

Referring to Fig. 10 the casing 87 has a closed bottom 88 and a removable non-conducting top 89 and a removable curved rim 90 is overlapped on the perimeter of the casing 87 as at 91. Journalled in the bottom 88 and top 89 in vertical parallel relation with the wall of the casing 87 is a shaft 92 and collars 93 adjacent the ends of the shaft retain the shaft in proper position for the journalling thereof. On the shaft 92 is a large worm gear 94 which is engaged by the worm 95 on the drive shaft 96 of a motor 97 mounted in the casing 87.

Fixed to the bottom 88 of the casing 87 adjacent the shaft 92 is a bearing bracket 98. Journalled in this bracket 98 and the top 89 is a short shaft 99. The shaft 99 extends above the top 89 to receive the sweep or conductor arm 100. Carried at the end of the arm 100 is a contact point 101 the purpose of which will be later described. The lower end of the shaft 99 frictionally engages the contact bracket 102 which is carried by yet insulated from the bracket 98. Collars 103 and 104 are carried by the shaft 99 to retain the shaft 99 in like manner as is shaft 92.

Fixed to shaft 92 intermediate of the collar

93 and worm gear 94 is a small gear 105 which is in alinement and engagement with a similar gear 106 on shaft 99. Thus as shaft 92 is rotated by the motor 97 the shaft 99 carrying the sweep arm 100 will in turn be rotated.

Referring to the diagram shown in Fig. 11 it will be noted that the contact 79 is connected with the movable arm 107 of a switch by the lead 108. The fixed contact 109 of the switch being connected to the motor 97 by a lead 110 and a lead 111 to the casing 87 will ground the circuit for the operation of the motor.

A secondary lead 112 from the lead 110 is connected to the contact bracket 102 and provides a positive source of current for the arm 100.

Concentrically arranged on the insulated top 89 of the casing 87 is a plurality of contacts 113. The contacts are so arranged that they lie in the path of rotation of the contact point 101 on the arm 100. From each contact 113 a lead 114 is connected to the squib 115 at the upper end of each flare 52.

The squib comprises a hot wire 116 and an ignition charge 117 Fig. 9 and each squib is grounded by a lead 118 to the body 39. The grounds being uniform since portion 42 is connected to the body 39 and the body 39 is connected to the casing 87.

In the operation of this portion of the invention the raising of the cover 22 will cause the plunger 73 to move upwardly through the expansion of the spring 76. Contact 77 engaging contact 79 and with the contact 107 engaging contact 109 the motor 97 will be energized. The motor will then cause the arm 100 to rotate when the contact 101 engages the contact 113 current will flow to the squib 115 causing the hot wire 116 to ignite the charge 117 and the flare 52. Thus the flare will burn and the device will be visible.

The rotation of the arm is controlled through the medium of the gears so that one flare will not be ignited until the other one has been extinguished. Any period of time being available through the use of various size gears as desired.

For visibility during the day the following structure is used.

Secured to each side of the body 39 is a bracket plate 119 and to each bracket plate there are fixed by means of straight ends 119' two coil springs 120 to which is fixed by means of the bent ends 121 a marker 122. Secured by springs 120' having oppositely bent ends 121' are a plurality of similar markers 122' to form a pattern as shown in Fig. 3. The markers may use two contrasting colors as shown in this figure or other characteristics of identification may be used.

The device has been described as a float, but if it is desirable to locate the device before a ground crash, a ground penetrating spike 123 formed on a circular plate 124 is used. The plate 124 being fixed to the bottom of the portion 42.

In use the device is placed in the container 21 either in the airplane as shown in Fig. 1 or it may be positioned on the deck of a vessel.

When a crash of the plane on the water is inevitable the lever 28 will be moved causing the cable 26 to pivot the latch 24 to cause the cover 23 to open. As the airplane strikes the water the body 39 will float, in the meantime the markers have moved and the device will float on the water as shown in Fig. 3. A reel 125 mounted in the fuselage 20 has a cable 126 thereon which is connected to the eye bolt 127 on the body 39. Thus the cable will retain the body in close proximity to the plane. When the device is placed in the container arm 107 of the switch is engaged with the contact 109. Thus when the plunger moves upward through release of the cover 22 the circuit in the device will be made and the motor 97 will be energized to start the sweep arm 100 to ignite the flares. Should there be any survivors of the crash and they should desire to save the remaining flares the arm 107 can be moved out of engagement with the contact 109 and the motor deenergized until the arm 107 is again engaged with the contact 109.

There has thus been provided a device which can be used on airplanes or vessels to indicate the position of a crash or sinking.

It is believed that from the foregoing description the structure and operation of the device will be apparent to those skilled in the art, and it is to be understood that changes in the minor details of construction, arrangement and combination of parts may be resorted to, provided they fall within the spirit of the invention and the scope of the appended claims.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. An automatic signal flare and marker buoy comprising a buoyant body, a tubular portion secured to and extending below the body, a plurality of flares carried by said tubular portion, apertured discs in said portion engaging said flares to retain said flares in spaced relation to each other, and electrically actuated means having electrical connection with the flares for intermittently igniting said flares carried by said body when said means is actuated.

2. An automatic signal flare and marker buoy comprising a buoy body and a flare containing portion secured thereto and depending therefrom, flares in said flare containing portion, apertured discs in said flare containing portion engaging said flares to retain said flares in spaced relation to each other, means for igniting the flares carried by each flare, a current source carried in said flare containing portion and connected to the means for igniting said flares and means interpolated between said last means and said current source to cause the operation of said igniting means at predetermined intervals of time.

3. In an automatic signal flare and marker buoy having a buoyant body and a flare containing portion having flares therein, connected to a source of electrical current, and a plurality of apertured discs in said flare containing portion engaging said flares to retain the same in spaced relation to each other, the improvement comprising timing mechanisms connected to said flares and to said source of electrical current for causing the ignition of the flares at predetermined time intervals.

4. In an automatic signal device for use with an airplane the improvement comprising a casing mounted in said airplane for retaining the signal device therein, said casing having remote controlled spring hinged doors, a buoyant body in said casing having a flare containing portion thereon, flares in said portion, a plurality of apertured discs in said flare containing portion engaging said flares to retain the same in spaced relation to each other, an electrical source of current connected to said flares and means carried by said body and connected to said flares and to said source of current for causing ignition of

said flares by said source of current upon the opening of the doors of said container.

5. A float signal for aerial and marine use comprising a buoyant body, a flare containing portion on said body, flares in said portion, means in said portion for retaining said flares in spaced relation to each other, dry cells in said portion intermediate of said last means, means carried by said flares for the ignition thereof, and means connected to said dry cells and to the means for igniting the flares whereby said last means is caused to ignite said flares at predetermined time intervals.

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