

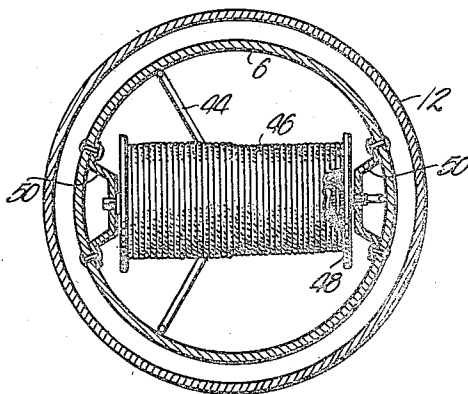
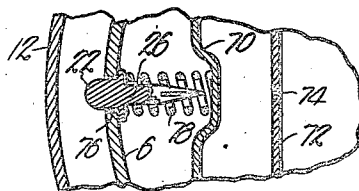
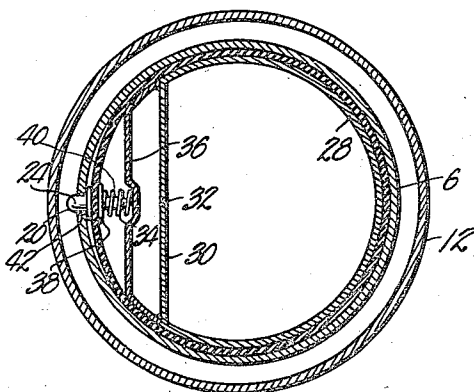
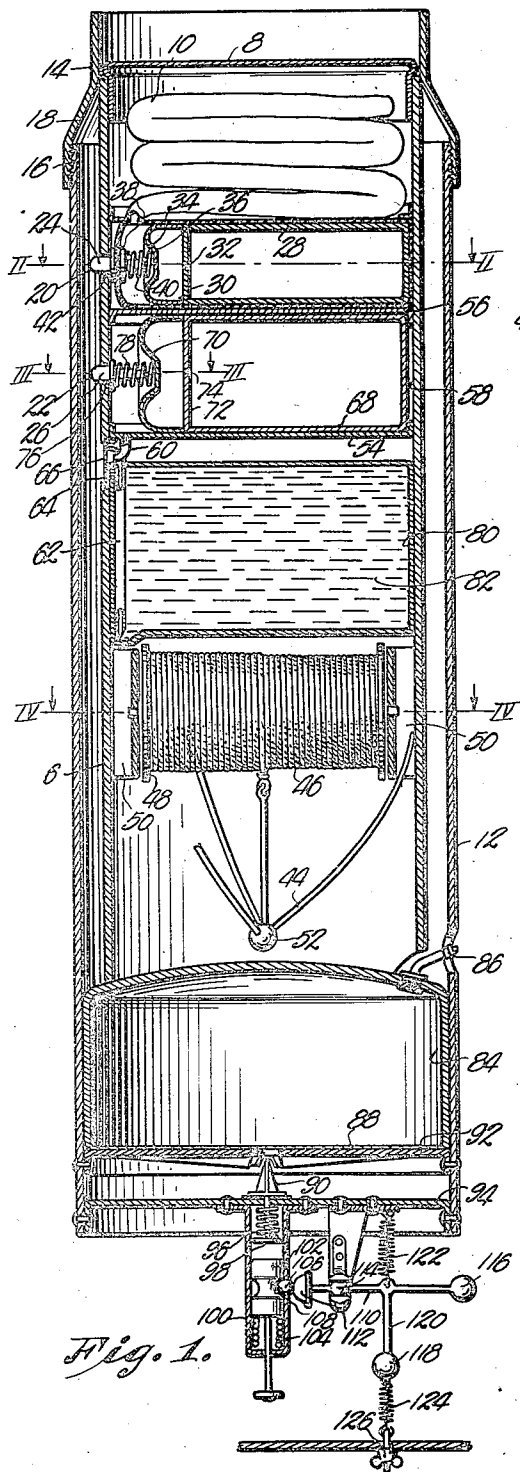
March 5, 1940.

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2,192,450

POSITION INDICATOR FOR AIRPLANES

Filed May 15, 1939



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2,192,450

POSITION INDICATOR FOR AIRPLANES

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Application May 15, 1939, Serial No. 273,819

11 Claims. (Cl. 116—124)

This invention relates to markers particularly adapted for use in indicating the position of airplanes or other craft, that have been incapacitated through a wreck or forced landing, and the primary object is to provide means of such character which is automatically brought into use when the craft encounters difficulty of sufficient magnitude to disable the normal signaling devices carried by the craft and to release the specially formed mechanism constituting a part of the position indicator embodying this invention.

One of the important aims of this invention is the provision of a position indicator for airplanes or the like, which comprises means for automatically releasing a specially formed shell wherein is disposed a balloon and an anchor assembly, both of which combine to set up a signal above the wrecked craft so that searchers may be guided to its location.

A further object of the invention is to provide an indicator of the aforementioned type that has means for coloring an area of the territory adjacent to the distressed craft, immediately after the position indicator has been brought into play so that searchers may be directed to the location of a disabled airplane, by observing the contrasting color that has been sprayed upon the ground, trees or vegetation close to where the indicator first left its place in the body of the craft.

Further objects of the invention are to provide a position indicator for airplanes wherein is included unique means for automatically ejecting certain parts of the indicator from the normal position when excessive jars are imparted to parts of the craft carrying the same; to provide a specially formed, inflatable balloon which will be filled with gas immediately after the shell of the indicator is ejected from the housing; and to provide positively acting elements for spraying a supply of colored liquid over large areas of the territory adjacent to the place where the specially formed shell of the indicator was projected from its housing.

An even further important object of this invention is the provision of a position indicator for airplanes or crafts, wherein such devices are desirable that is especially light, compact, durable and capable of being instantaneously brought into play when the airplane is forced to land or when a destructive jar is imparted to the body of the craft equipped with the indicator.

Other objects of the invention, including specific ways of embodying the concepts thereon in

a practical, commercial form of indicator, will appear during the course of the following specification, referring to the accompanying drawing wherein:

Figure 1 is a longitudinal central sectional view through a position indicator for airplanes or similar craft, made in accordance with the present invention.

Fig. 2 is a cross sectional view through the indicator taken on line II—II of Fig. 1.

Fig. 3 is an enlarged fragmentary detailed sectional view through a portion of the indicator assembly taken on line III—III of Fig. 1; and

Fig. 4 is a cross sectional view through the indicator taken on line IV—IV of Fig. 1.

When installing the indicator, its longitudinal axis should be in a vertical position so that shell 6 may be projected upwardly with sufficient force to move the same an appreciable distance above the equipped craft.

Shell 6 is cylindrical and open at both ends. The upper end, however, should be closed by an easily removable cap 8 so that as the balloon 10, immediately therebelow, is inflated, it will be lifted from place to allow the balloon to extend outwardly from the upper end of shell 6.

A housing 12 should be rigidly carried by a part of the ship or craft not here shown. This housing is appreciably greater in diameter than shell 6 along the portion thereof circumscribing said shell when the indicator is in the normal position.

An upper section 14 mounted upon housing 12 through the medium of screw threads or the like 16, presents an upwardly and inwardly inclined wall 18 against the inner angular face of which, heads 20 and 22 of button 24 and punch 26 respectively, engage when shell 6 is projected.

Balloon 10, when deflated, is disposed adjacent the upper end of shell 6 and folded in place with gas tank 28 entirely confined therein. This tank 28 has a partition 30 which is provided with a small port 32 through which the gas in tank 28 escapes when pick 34 has pierced wall 36. Pick 34 is provided with a head 38, and a spring 40 normally maintains pick 34 in the position shown in Fig. 1 with its point spaced away from wall 36. One end of spring 40 is secured to the outer face of wall 36 and the other end thereof is attached to head 38, thus pick 34 is mounted on tank 28 and cannot escape into the balloon 10.

Button 24 is slidably carried in hole 42 formed in shell 6 opposite to head 38 on pick 40. This button 24 may move in to compress spring 34 when shell 6 is ejected from housing 12. Tank 28

28 is anchored in shell 6 so that when balloon 10 is inflated, its buoyant nature will hold the ejected shell 6 in an elevated position.

Near the other end of shell 6 is disposed an anchor 44 secured to one end of cable 46, the other end of which is attached to spool 48 rotatably carried within shell 6 through the medium of bearing brackets 50. Anchor 44 may be weighted as at 52 to permit the action of gravity to unwind cable 46 immediately after shell 6 is moved from within housing 12.

Spaced apart partitions 54 and 56 set off a compartment 58 in shell 6. This compartment is in communication with tube 60 that terminates in pipe 62 to form an ejector nozzle, the end of which is in window 64 normally covered by a light membrane 66. A compressed air tank 68 is positioned within compartment 58 and like gas tank 28, is arranged to have the air therein automatically released into compartment 58 when punch 26 has pierced relatively thin wall 70 of tank 68.

A partition 72 in tank 68 has a small port 74 therethrough to allow the escape of compressed air in a gradual, even manner. Head 22 of punch 26 extends outwardly through hole 76 in the wall of shell 6 where it may be engaged and forced inwardly by the inclined portion 18 of section 14. A spring 78 maintains punch 26 in the normal position away from wall 70 of tank 68.

A reservoir 80 containing colored liquid 82 is carried in shell 6 between anchor 44 and chamber 58. Pipe 62 is in communication with reservoir 80. The liquid 82 should be of a substance which will not freeze at low temperatures and the pigment used in the liquid should impart a color thereto that is suitable for the season. As an example, when snow covered territory is being flown over by the airplane, the liquid should be of a dark color, such as blue or black, but during the time when snow is not on the ground, the liquid should be white or a light color so that trees or other vegetation may be coated with a covering that is relatively easy to detect.

Means for ejecting shell 6 is in the nature of a drum 84 which contains compressed air and which may be filled with such air through the medium of a valve 86. The pressure within drum 84 should be at least 2,000 pounds per square inch, and the bottom wall 88 of drum 84 should be relatively thin or have a thin portion through which spur 90 may pass when the hereinafter described spur-actuating mechanism is brought into play.

Drum 84 rests upon partition 92 of housing 12 and floor 94 of this housing 12 carries spur 90. Spur 90 is reciprocally mounted and maintained in a normal position by compression spring 96. One end of stem 98 of spur 90 extends downwardly into tube 100 wherein is reciprocally mounted an annularly grooved piston 102. This piston has a coil spring 104 in engagement with one end which tends to force the piston against the end of stem 98. A loose ball 106 extends through opening 108 of tube 100 to lie in groove of the piston 102.

A specially formed arm 110 having the dome-shaped head 112 on one end thereof, is supported by a universal joint 114. A weight 116 is on the other end thereof of arm 110 and a weight 118 is carried by a laterally extending portion 120. Portion 120 and arm 110 are disposed at right angles to each other and a pair of springs 122 and 124 respectively, yieldably maintain the parts

carried by universal joint 114 in the normal set position. The tension of spring 124 may be varied through the use of a thumb nut and bolt arrangement 126, to the end that the jar which will release piston 102, may be predetermined. When the mechanism including arm 110 is constructed and mounted as illustrated, the force of an impact in any direction will disengage head 112 from ball 106 if the tension of springs 122 and 124 is overcome.

It is obvious to one skilled in the art that when the mechanism just described is moved to release piston 102, spring 104 will force spur 90 through wall 88 of drum 84. A quick release of the compressed air in drum 84 will force shell 6 upwardly out of housing 12 with sufficient momentum to lift the same an appreciable distance above the point of release. In fact, the sudden opening of drum 84 is of explosive proportions and projects shell 16 from housing 12 with great force. As shell 6 passes through section 14 of housing 12, the gas from tank 28 will be released and the air from tank 68 will escape through tube 60 because heads 22 and 24 will be moved inwardly by inclined wall 18.

As shell 6 rises, due to the force originally exerted by piercing drum 84, gas from tank 28 will enter balloon 10 and force it out of the upper end of the shell. When a sufficient amount of gas has entered balloon 10 to impart buoyancy thereto, it will suspend shell 6 and all contained parts above the ground.

Anchor 44 which has been unwinding cable 46 from spool 48, will automatically engage a tree, bush or other thing on the ground to preclude objectionable floating away when balloon 10 is inflated.

During the time shell 6 was rising, ejector nozzle formed by the meeting of tube 60 and pipe 62 will force colored liquid 82 from reservoir 80 in the form of a spray which will coat objects on the ground below the shell. Balloon 10 will become a marker for searchers, and if anchor 44 has not satisfactorily engaged something to avoid floating, then the colored liquid which has coated underlying objects, will become a trail by means of which the wreckage may be more easily located.

Obviously, the position indicator just described may be altered considerably in form and nature without departing from the spirit of the invention or 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. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing.

2. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for forcing the liquid from the reservoir comprising a tank of com-

pressed air, means for releasing the air from the tank, an ejector nozzle in connection with the tank and said reservoir for withdrawing the liquid from the reservoir and directing it outwardly from the shell, and parts on the housing engageable with the means for releasing the air from the tank as the shell is ejected from the housing.

3. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for forcing the liquid from the reservoir comprising a tank of compressed air, a punch to perforate the tank, a spring to withdraw the punch from the perforation created in the tank thereby, an ejector nozzle in communication with the tank and said reservoir for withdrawing the liquid from the reservoir and directing it outwardly from the shell, and a part on the housing engageable with the punch to force it into the tank as the shell is ejected from the housing.

4. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for forcing the liquid from the reservoir comprising partitions in the shell setting off a compartment, a tank of compressed air in the compartment, a punch extending into the compartment and outwardly from the shell, a spring to yieldably hold the punch in the normal position, an ejector nozzle in connection with the compartment and said reservoir for withdrawing the liquid from the reservoir and directing it outwardly from the shell, and a part on the housing engageable with the punch to force it into the tank to perforate the same as the shell is ejected from the housing.

5. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for forcing the liquid from the reservoir comprising a tank of compressed air, a punch to perforate the tank, a spring to withdraw the punch from the perforation created in the tank thereby, an ejector nozzle in communication with the tank and said reservoir for withdrawing the liquid from the reservoir and directing it outwardly from the shell, and a part on the housing engageable with the punch to force it into the tank as the shell is ejected from the housing, said compressed air tank having a partition therein to divide the same into a high pressure and a low pressure chamber, the wall of said low pressure chamber being relatively thin for perforation by said punch.

6. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for ejecting the shell from the housing comprising a drum of compressed air in the housing between one end of the latter and one end of the shell, a spur for puncturing the drum, and mechanism including a weight for actuating the spur when the housing is subjected to excessive jar.

7. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; and structure carried by the housing and said shell for rendering operative the said means for forcing the liquid from the reservoir as the shell is ejected from the housing, said means for forcing the liquid from the reservoir comprising partitions in the shell setting off a compartment, a tank of compressed air in the compartment, a punch extending into the compartment and outwardly from the shell, a spring to yieldably hold the punch in the normal position, an ejector nozzle in connection with the compartment and said reservoir for withdrawing the liquid from the reservoir and directing it outwardly from the shell, and a part on the housing engageable with the punch to force it into the tank to perforate the same as the shell is ejected from the housing, said means for ejecting the shell from the housing comprising a drum of compressed air in the housing between one end of the latter and one end of the shell, a spur on the housing for puncturing the drum, and mechanism for actuating the spur when the housing is subjected to excessive jar, the force exerted upon the shell by said ejecting means being sufficient to move the shell out of the housing and to force the punch through the wall of said compressed air tank.

8. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; structure carried by the housing and said shell for rendering operative the said means for forcing liquid from the reservoir as the shell is ejected from the housing; a deflated balloon releasably disposed in the shell near one end thereof; a tank of gas for inflating the balloon; and means for releasing the gas from the tank and into the balloon as the shell is ejected from the housing.

9. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; structure carried by the housing and said means for forcing liquid from the reservoir as the shell is ejected from the housing; a deflated balloon releasably disposed in the shell near one end thereof; a tank of gas for inflating the balloon; and means for releasing the gas from the tank and

into the balloon as the shell is ejected from the housing, said tank of gas for inflating the balloon being within the balloon and secured to the shell whereby to support the latter in an elevated position above the ground after the balloon is inflated.

10. A position indicator of the character described comprising a housing; a projectable shell within the housing having a reservoir containing colored liquid; means for forcing the liquid from said reservoir in the form of spray; means for ejecting the shell from within the housing; structure carried by the housing and said shell for rendering operative the said means for forcing liquid from the reservoir as the shell is ejected from the housing; a deflated balloon releasably disposed in the shell near one end thereof; a tank of gas for inflating the balloon; means for re-

leasing the gas from the tank and into the balloon as the shell is ejected from the housing; an anchor in the shell at the other end of the latter; a spool rotatably supported in the shell; and a cable wound on the spool, one end of the cable being secured to the anchor, the other end of said cable being attached to the spool.

11. In a device of the kind described, having means for ejecting a shell from a housing upon subjecting the housing to excessive jar, mechanism for actuating the ejecting means comprising a reciprocable plunger; an arm in connection with the plunger; a universal joint supporting the arm; and weights arranged on the arm to break its connection with the plunger when the jar occurs.

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