EMERGENCY RADIO SIGNAL FOR AIRPLANES

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EMERGENCY RADIO SIGNAL FOR AIRPLANES

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This invention relates to improvements in signalling devices and has particular reference to means for signalling when an airplane has crashed at a remote point.

The principal object of this invention is to provide means whereby a radio signal will be automatically and periodically transmitted from a point adjacent the scene of the wreck, thus eliminating the human element ordinarily required in the broadcasting of a distress signal.

A further object is to provide a signalling apparatus which will be ejected from the airplane body a safe distance away from the wreckage so that the signalling apparatus will not be damaged by an explosion or fire.

A still further object is to provide a time delay mechanism wherein the apparatus, after being ejected from the airplane will have sufficient time to come to rest before the antenna is released, thereby eliminating any possibility of the antenna being damaged.

A further object is to produce a device of this character which is economical to install and which requires no major changes in the construction of the airplane.

Another object is to provide means whereby the signalling device may be manually discharged from the plane, if desired.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Fig. 1 is a diagrammatic view showing the wreckage of a plane and the course of the projected signalling unit.

Fig. 2 is an enlarged cross-sectional, fragmentary view of the unit as the same would be housed in the airplane body.

Fig. 3 is an enlarged cross sectional view of the unit showing the antenna in retracted position.

Fig. 4 is a cross sectional view taken on the line 4-4 of Fig. 3.

Fig. 5 is an enlarged fragmentary detail view showing the releasing mechanism for the clock mechanism.

Fig. 6 is a diagrammatic view showing one form of the code wheel and contact, and

Fig. 7 is a schematic wiring diagram of the antenna release mechanism.

Many airplanes have crashed in remote locations, particularly in stormy weather, where it has been difficult to locate the wrecked plane, this being especially true in mountainous country or in snow-covered terrain.

Applicant has, therefore, devised a signalling mechanism which may be carried by the plane and so positioned that the shock resulting from the crash of the plane would release a signal transmitting mechanism, discharging the same from the body of the plane a sufficient distance away from the scene of the crash that the same will not be in any danger of being consumed by a resulting fire in the plane, and to thereby cause the mechanism, after it has come to rest upon the ground, to eject an antenna, which antenna will assume a substantially vertical position, and to thereby cause a radio transmitter to be actuated for the purpose of broadcasting a code at regular intervals and over a considerable period of time.

Thus, it will be possible for searching parties to secure cross bearings on the broadcasting of the signal from the scene of the accident and to immediately locate the wreckage and thus enable rescue parties to reach the wreckage without unnecessary delay.

In accomplishing my object I form in the body of the plane and at a point preferably adjacent the tail section a housing 5, in which is slidably secured the broadcasting unit designated as a whole by the numeral 6.

In order to project the unit out of the housing 5 I employ a cylinder 7, which is spring mounted, as shown at 8, and has a piston 9, which is provided with a pusher 11 engaging the curved end of the unit 6.

Within the cylinder 7 is placed an explosive 12, which is fired by a primer 13, which primer is in alignment with a firing pin 14. This firing pin may be manually actuated through the medium of a key 16, controlling the flow of current to a solenoid 17; however, when a wreck occurs the impact will cause the cylinder 7 to move sideways or toward the nose of the plane, with the result that the primer 13 will be engaged by the firing pin 14 and will be exploded in the usual manner, which will in turn set off the charge 12, and this will then project the unit 6 a considerable distance away from the plane, from which point a broadcast signal may be transmitted.

The unit 6 comprises an outer casing, 18, the sides of which are curved inwardly (see Figs. 3 and 4), this casing has curved ends, as shown at 19. This particular shape is such that the unit when it lands will not roll unnecessarily and will not rest on either end; therefore, one side will be uppermost and through this side the antenna
may be projected through hinged doors 21 and 22. These doors are ordinarily closed by springs not shown.

Within the casing is an inner casing 23 which is shock mounted by sponge rubber, as shown at 24. This inner casing in turn has mounted within it a radio transmitter 26, a code wheel 27, which is provided with a contact 28. This code wheel is in turn driven by a spring motor 29 through the medium of gears 31 and 32.

This motor also drives a wheel 30, having pins 33 and 34 forced thereon, the purpose of which will be later seen. A battery is shown at 35, which serves to furnish the "A" and "B" current to the transmitter 26.

A division wall 36 formed in the inner casing 23 serves to pivotally support an antenna bearing 37, in which is sidely supported a collapsible antenna designated as a whole by the numeral 38, which antenna consists of a plurality of telescopic sections normally held in telescopic positioning by a solenoid actuated pin 39, which pin is actuated by a solenoid 40.

The antenna is kept from rotating on its pivot 37 through the medium of a solenoid actuated pin 41, actuated by the solenoid 43.

Referring now to Fig. 5, it will be noted that the gear 32 is engaged by the nose 44 of a pivoted lever 45. A spring 47 tends to pull this nose out of its engagement with the gear 32 but the same is held through the medium of a rod 48 secured to the housing 8. (See Fig. 2.) This rod 43 has its free end extending through a water-proofed sleeve 49, the purpose of which will be later seen.

Referring now to Figs. 3 and 7, it will be noted that I have provided switches 51 and 52, which have their ends in alignment with the pins 32 and 33. These switches are in turn connected to the solenoids 41 and 43 and to the transmitter 26.

Assuming now that my broadcasting unit has been positioned in the housing 5 of an airplane, and that the airplane crashes, the impact of the crash will cause the cylinder 7 to advance and drive the primer 13 against the firing pin 14, thus setting off the primer and the explosive charge, with the result that the broadcasting unit will be projected from its housing 5, as shown by the dotted line in Fig. 1.

The unit will undoubtedly roll when it contacts the ground and will eventually come to rest on one of its sides due to the peculiar construction of the outer casing 15. As the unit was projected from the airplane the rod 43 will have been withdrawn from the rubber sleeve 49, and consequently the spring 47 will function to withdraw the nose 44 of the lever 45 from its engagement with the gear 32, and the motor 29 will now cause rotation of the gears 31 and 32 and the wheel 30.

A delayed action of about ten minutes permits the entire unit to come to rest upon the ground, after which the contact 33 will engage the switch 52, which will actuate the solenoid 43, drawing in the pin 42 and releasing the antenna so that it may revolve upon its pivot, the bottom of the antenna being counterweighted so that it will assume a vertical position.

Further rotation of the wheel 30 will cause the pin 35 to engage the switch 51, which in turn will actuate the solenoid 41, withdrawing the pin 33, after which the spring in the antenna may function to cause the telescopic sections to be projected through the doors 21 and 22 on the top of the unit.

By this time the transmitter tubes have become properly excited and are then capable of transmitting code signals as given off by the code wheel 27 and its contact 28.

It is obvious that any form of transmitter can be employed, as for example a voice transmitter and that a microphone and miniature loud speaker could be easily incorporated in the device without altering the spirit of the invention.

It is also obvious that instead of using a telescopic type of antenna a cartridge might be used, which when fired out of the unit, would initiate a balloon connected to the apparatus by an aerial wire. This type of antenna would increase the sending range of the unit and would also be readily visible for a greater distance, so that rescue parties could locate the balloon traveling directly toward the same with greatest speed.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

1. A signaling unit for expulsion from an airplane, comprising an outer casing having concaved sides and convexed ends, an inner casing shock mounted in said outer casing and having a broadcasting transmitter positioned therein, a collapsible antenna rotatably positioned therein, and means for ejecting said antenna through said outer casing and in substantially vertical position.

2. A signaling unit for expulsion from an airplane, comprising an outer casing having concaved sides and convexed ends, an inner casing shock mounted in said outer casing and having a broadcasting transmitter positioned therein, a collapsible antenna rotatably positioned therein means for ejecting said antenna through said outer casing and in substantially vertical position, and a time delay mechanism for controlling the ejection of said antenna.

3. A signaling unit positioned in an airplane body and adapted to be expelled therefrom, comprising a substantially rectangular outer casing having concaved sides and convexed ends, an inner casing positioned in said outer casing and resiliently supported therefrom, said inner casing having a radio transmitter, a code wheel for actuating said transmitter, a drive mechanism therefor, means carried by said airplane for releasing said drive means when said unit is expelled from said airplane, an antenna positioned in said inner casing, and means for ejecting said antenna through said outer casing in a substantially vertical position.

4. A signaling unit positioned in an airplane body and adapted to be expelled therefrom, comprising a substantially rectangular outer casing having concaved sides and convexed ends, an inner casing positioned in said outer casing and resiliently supported therefrom, said inner casing having a radio transmitter, a code wheel for actuating said transmitter, a drive mechanism therefor, means carried by said airplane for releasing said drive means when said unit is expelled from said airplane, an antenna positioned in said inner casing, and means for ejecting said
antenna through said outer casing in a substantially vertical position, said last mentioned means comprising a time delay antenna release actuated by said driving means.

5. A signalling unit for expulsion from an airplane, comprising an outer casing having con-caved sides and convexed ends, an inner casing shock mounted in said outer casing and having a broadcasting transmitter positioned therein, a collapsible antenna rotatably positioned therein, means for ejecting said antenna through said outer casing and in substantially vertical position, and a counter weight at the lower end of said antenna urging the same to rotate into vertical position.

6. A signalling unit for expulsion from an airplane, comprising an outer casing having con-caved sides and convexed ends, an inner casing shock mounted in said outer casing and having a broadcasting transmitter positioned therein, a collapsible antenna rotatably positioned therein, means for ejecting said antenna through said outer casing and in substantially vertical position, a time delay mechanism for controlling the ejection of said antenna, a counter weight at the lower end of said antenna urging the same to rotate into vertical position, means normally holding said antenna against rotation, timing means releasing the last means at a predetermined time after expulsion of said outer casing, and means restraining the timing means from action prior to expulsion of the casing.

10. A signalling unit for expulsion from an airplane, comprising an outer casing having con-caved sides and convexed ends, an inner casing shock mounted in said outer casing and having a broadcasting transmitter positioned therein, a collapsible antenna rotatably positioned therein, means for ejecting said antenna through said outer casing and in substantially vertical position, a time delay mechanism for controlling the ejection of said antenna, a counter weight at the lower end of said antenna urging the same to rotate into vertical position, means normally holding said antenna against rotation, timing means releasing the last means at a predetermined time after expulsion of said outer casing, and means restraining the timing means from action prior to expulsion of the casing.

11. In combination with the hull of an airplane, of a casing mounted substantially radially in said hull and having an outer end opening therethrough, a signalling device held in the outer end of said casing, a cylinder in the inner end of said casing and having an explosive charge at its inner end, said cylinder being spring mounted for lateral movement at its inner end, a firing nipple provided with a cap projecting laterally from the inner end of said cylinder, and a firing pin carried by said casing and engageable by said cap upon lateral movement of said cylinder.

12. In combination with the hull of an airplane, of a casing mounted substantially radially in said hull and having an outer end opening therethrough a signalling device held in the outer end of said casing, a cylinder in the inner end of said casing and having an explosive charge at its inner end, said cylinder being spring mounted for lateral movement at its inner end, a firing nipple provided with a cap projecting laterally from the inner end of said cylinder, a firing pin carried by said casing and engageable by said cap upon lateral movement of said cylinder, and manually controllable means causing said firing pin to engage said cap independently of lateral movement of said cylinder.

CHARLES J. CAMP.

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