June 29, 1937. W. A. HAMILTON 2,085,585

EMERGENCY ANTENNA

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Fig. 5.

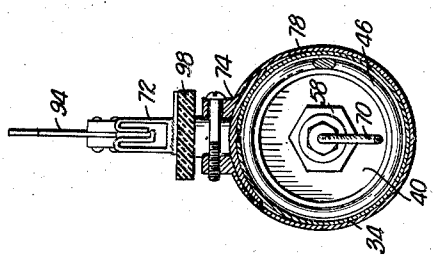


Fig. 4.

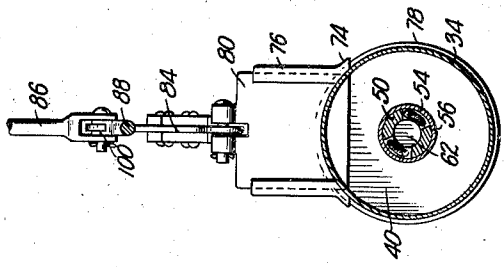


Fig. 1.

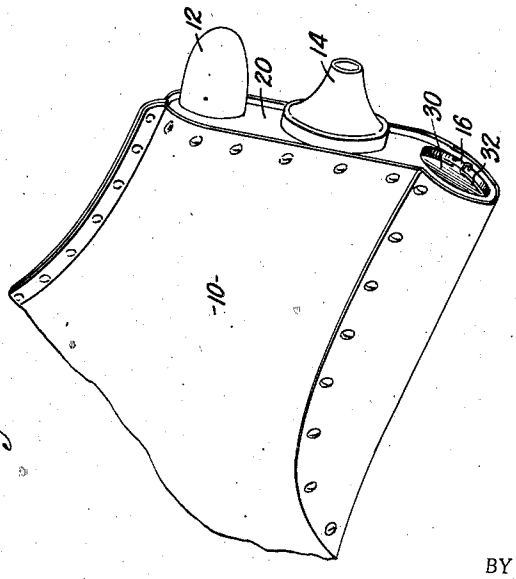
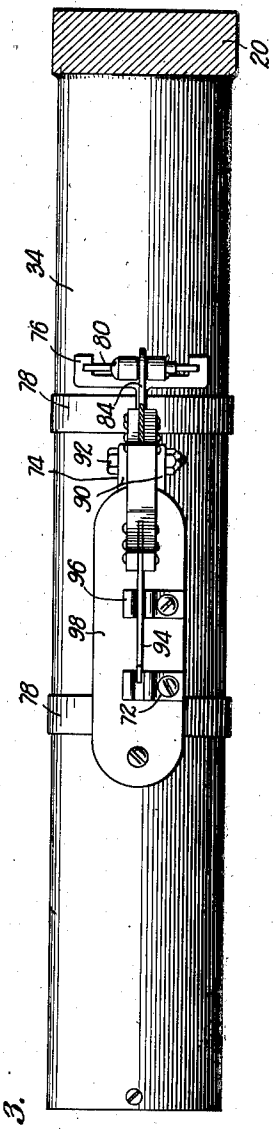


Fig. 3.



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EMERGENCY ANTENNA

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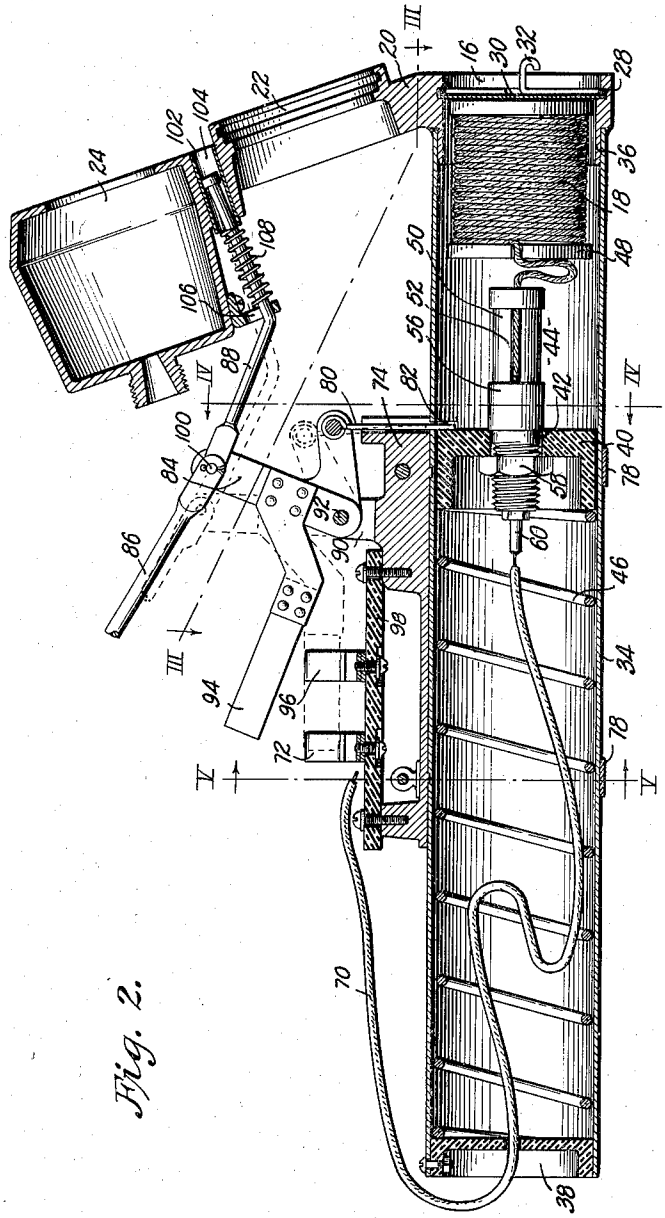


Fig. 2.

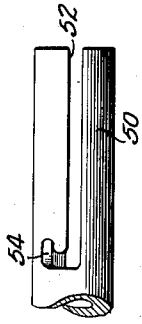


Fig. 8.

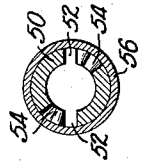


Fig. 7.

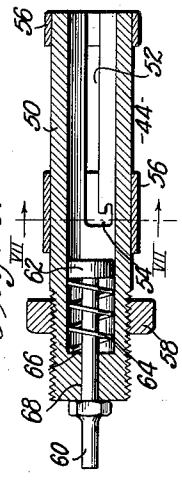


Fig. 6.

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UNITED STATES PATENT OFFICE

2,085,585

EMERGENCY ANTENNA

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Application January 30, 1937, Serial No. 123,220

9 Claims. (Cl. 250—33)

This invention relates generally to radio apparatus for airplanes and specifically to emergency antenna assemblies designed for use as equipment auxiliary to the regular trailing antenna now commonly employed.

One of the important aims of the present invention is to provide an emergency antenna assembly that may be carried adjacent to an opening formed in the airplane body so that upon failure of the regular trailing antenna, or due to the loss thereof, another trailing antenna might be quickly disposed in the operative position by the pilot or other attendant.

A further aim of this invention is the provision of an emergency antenna for airplanes, which includes as a part thereof, a projectable coil antenna cable, manually releasable mechanism for forcibly expelling the said cable, and a switch which simultaneously acts to electrically connect the antenna cable with the radio receiving or sending apparatus that constitutes a part of the airplane equipment.

An even further object of this invention is to provide an emergency antenna assembly of the aforementioned character that is simple in construction, effective in operation, light and positive in performance.

Other objects of the invention are also contemplated and will appear during the course of the following specification, referring to the accompanying drawings, wherein:

Figure 1 is a fragmentary, perspective view of the tail portion of an airplane equipped with an emergency antenna embodying the present invention.

Fig. 2 is an enlarged, longitudinal, central, sectional view through the emergency antenna assembly, showing the same entirely removed from association with the airplane.

Fig. 3 is a sectional view, taken along line III—III of Fig. 2.

Fig. 4 is a cross section through the assembly, taken along line IV—IV of Fig. 2, looking in the direction of the arrows.

Fig. 5 is a similar cross sectional view, taken along line V—V of Fig. 2, looking in the direction of the arrows.

Fig. 6 is an enlarged, longitudinal, central section through the antenna cable fixture per se.

Fig. 7 is a cross sectional view through the fixture, taken on line VII—VII of Fig. 6, and

Fig. 8 is a fragmentary, side elevational view of a portion of the tube forming a part of the fixture.

The tail portion 10 of an airplane of present commercial type is usually equipped with a tail light 12 and a trailing antenna socket 14. When installing an emergency antenna assembly embodying the present invention, tail piece 10 should be provided with an opening 16 of a size sufficient to permit the passage of the hereinafter more fully described coiled antenna cable 18. Opening 16 is disposed so that antenna cable 18 is traveling in a direction opposite to the movement of the airplane at the time of expulsion.

Figures 2 to 8 inclusive illustrate one commercially satisfactory embodiment of the features of this invention. A base casting 20, which may be secured to and form a part of the end of the airplane housing, is provided with an opening 22 and cavity 24 that contribute in providing supports for regular trailing antenna socket 14 and parts of tail light 12 respectively. The opening 16 is formed in base 20, and a groove 28 cut into the inner annular side provided by opening 16, receives a frangible cover 30 and retaining spring 32. Retaining spring 32 is ring-shaped and resilient, so that cover 30 may be quickly replaced. A barrel 34 extends inwardly from base 20, with its longitudinal axis on the center of opening 26, and is suitably secured to an annular flange 36, integral with base 20. The innermost end of barrel 34 is closed by a retainer 38, and a guide 40, of insulating material, is slidably carried within barrel 34. A central opening 42, formed in guide 40, receives fixture 44, and an expulsion spring 46 is positioned between retainer 38 and guide 40.

The coiled antenna cable 18 is, in the instance shown, wound upon a spool 48 which lies in close proximity to the outer end of barrel 34 and adjacent to cover 30. One end of antenna cable 18 is secured to fixture 44 in an unique manner. The tube 50, forming a part of fixture 44, has at least one slot 52 formed through the wall thereof, which terminates in a hook-shaped opening 54 that receives one end of cable 18. Collars 56 circumscribe tube 50 to overlie cable 18.

Fixture 44 is mounted upon guide 40, as illustrated in Fig. 2. One collar 56 forms a shoulder to lie against the outer face of guide 40, while nut 58 may be tightened against the inner face of guide 40 merely by turning the same upon its threaded support forming a part of tube 50. A connecting rod 60 has a head 62 on the inner end thereof, and a spring 64 lies between head 62 and shoulder 66 that circumscribes that portion of connecting rod 60 which passes through bore 68 drilled through the closed end of tube

50. One end of wire 70 is suitably secured to the outer end of connecting rod 60, while the other end thereof is joined to a switch clip 72.

A switch mounting 74, having vertical guides 76, is secured to barrel 34 by a pair of strap anchors 78. A release element 80 is slidably carried by guides 76 and projects into barrel 34 through a slot 82. Release element 80 is operably joined to one end of bell crank lever 84, while the other end thereof has connected thereto a clevis 86 and push rod release 88. Bell crank lever 84 is pivotally supported by switch mounting 74 between ears 90 by pin 92. Switch blade 94 is rigid to bell crank lever 84 and travels from the position shown in full lines to the position shown in dotted lines of Fig. 2.

Another clip 96, similar to clip 72, forms a part of the switch. These two clips 72 and 96 sit upon a switch block 98, that in turn is carried by switch mounting 74. This clip 96 is electrically connected to the radio apparatus of the airplane. Push rod release 88 has one end pivotally joined to one end of bell crank lever 84 as at 100, while the other end is provided with a head 102 and mounted in tube 104. A guide 106 assists in supporting push rod release 88, and a spring 108 is positioned between guide 106 and the end of tube 104.

Operation

Under normal conditions, the airplane equipped with an emergency antenna assembly as hereinbefore described, will have the regular trailing antenna extending from socket 14. The parts of the said assembly will be in the relation shown especially in Fig. 2. Upon the loss of the regular antenna, the pilot will want to immediately bring into play an emergency antenna, and may do so merely by manipulating connections to clevis 86. Such manipulation will withdraw release element 80 from in front of guide 40 so that expulsion spring 46 may quickly and positively move guide 40 and fixture 48 longitudinally along barrel 34 and against spool 48. This quick action will force the spool of coiled antenna cable through cover 30 and the cable will unwind so that its free end will trail behind the airplane. Spool 48 is lost.

Wire 70, by virtue of its connection with one end of cable 18 and clip 72, will be joined to the radio apparatus of the airship when switch blade 94 is drawn down into clips 72 and 96. If the trailing cable 18 is inclined to jerk wire 70, spring 64 will absorb the shock incident to such jerking and preclude injury to connecting wire 70.

From the foregoing it will become clear to one skilled in the art that the emergency antenna assembly is effective, efficient and desirable. The use of a frangible cover and other associated parts insures that the coil antenna cable 18 will be protected from the elements until the instant it is brought into play.

While one preferred embodiment of the invention has been illustrated and described, it is desired to be limited only by the spirit of the invention and 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. In an airplane having a body provided with an opening, the combination of a coiled antenna cable within the housing adjacent to the opening; and manually releasable mechanism for forcibly projecting the said coiled cable through said opening.

2. In an airplane having a body provided with an opening, the combination of a coiled antenna cable within the housing adjacent to the opening; and manually releasable mechanism for forcibly projecting the said coiled cable through said opening, said antenna cable having one end anchored within the housing whereby upon projection the cable becomes a trailing antenna.

3. In an airplane having a body provided with an opening, the combination of a coiled antenna cable within the housing adjacent to the opening; and manually releasable mechanism for forcibly projecting the said coiled cable through said opening, said opening having a frangible cover thereover which is broken by the coiled antenna cable as the latter is forced through the opening.

4. In an airplane having a body provided with an opening through the tail portion thereof and radio apparatus therein, the combination of a coiled antenna cable within the housing adjacent to the opening; a switch; and manually releasable mechanism for forcibly projecting the said coiled antenna cable through said opening, said switch having a clip in connection with the radio apparatus of the airplane and another clip in connection with said coiled antenna cable, said releasable mechanism having a blade for connecting the clips as the coiled antenna is projected through the opening whereby to operably interconnect the antenna cable and radio apparatus when the former becomes a trailing antenna.

5. An emergency antenna assembly of the character described comprising a barrel; a coiled antenna cable within the barrel; a frangible cover closing one end of the barrel; means for exerting force upon the coil antenna cable to project the same through the cover; and mechanism for releasably holding the said means inoperative.

6. An emergency antenna assembly of the character described comprising a barrel; a coiled antenna cable within the barrel; a spring for projecting the coiled antenna cable from the barrel; and mechanism for releasably holding the spring under tension and in inoperative condition with respect to the said cable.

7. An emergency antenna assembly of the character described comprising a barrel; a coiled antenna cable within the barrel; a switch mounted on the barrel having a member movable to open and close the same; and mechanism, including said movable switch member, for releasably holding the spring under tension and in inoperative condition with respect to the said cable, said movable switch member being in the switch-closing position when the mechanism is in place to release the spring.

8. An emergency antenna assembly of the character described comprising a barrel; a coiled antenna cable within the barrel; a switch mounted on the barrel having a member movable to open and close the same; and mechanism, including said movable switch member, for releasably holding the spring under tension and in inoperative condition with respect to the said cable, said movable switch member being in the switch-closing position when the mechanism is in place to release the spring, said antenna cable having a fixture at one end for anchoring that end to the assembly.

9. An emergency antenna assembly of the character described comprising a barrel; a coiled antenna cable within the barrel; a switch mounted on the barrel having a member mov-

able to open and close the same; and mechanism, including said movable switch member, for releasably holding the spring under tension and in inoperative condition with respect to the said cable, said movable switch member being in the switch-closing position when the mechanism is in place to release the spring, said antenna cable having a fixture at one end for anchoring that end to the assembly, said switch and the fixture being joined by a wire for the purpose specified.

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