Dec. 27, 1960 M. W. CLARK 2,966,674

AUTOMATIC SIGNALING DEVICE

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Fig. 1.

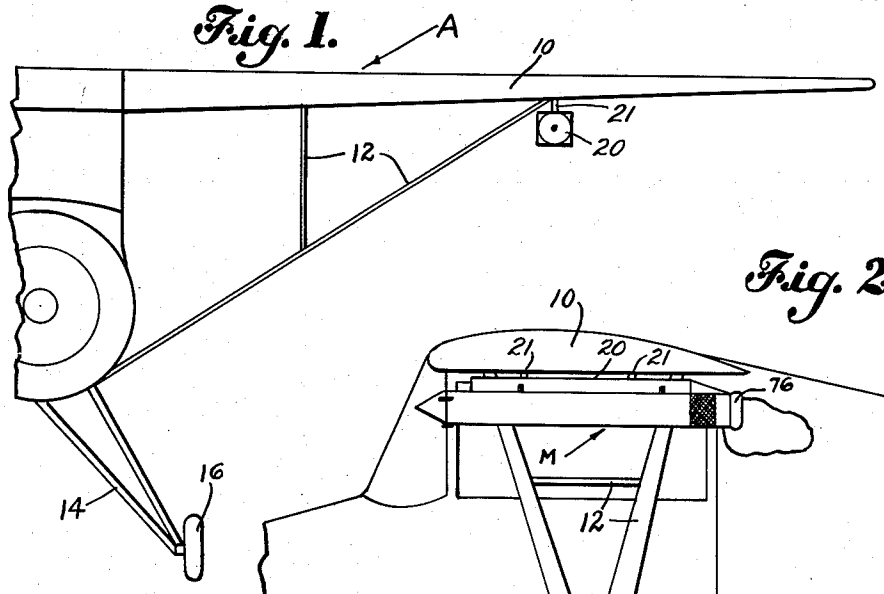


Fig. 2.

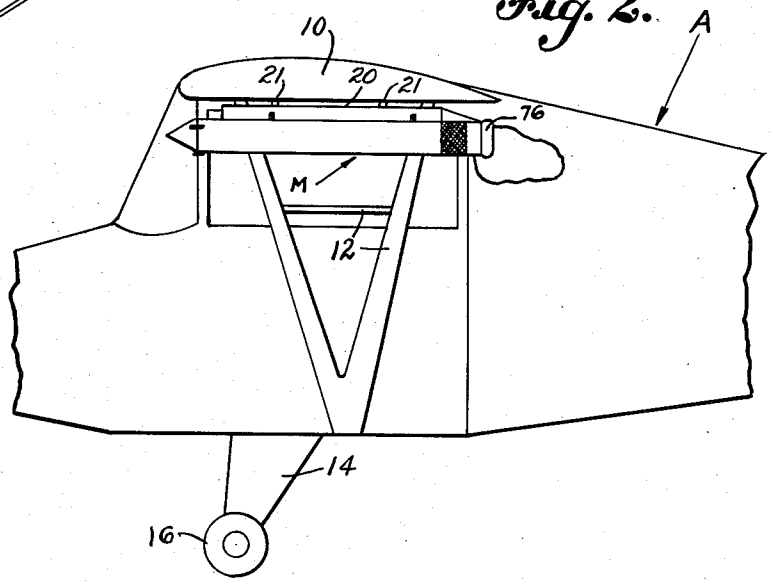


Fig. 3.

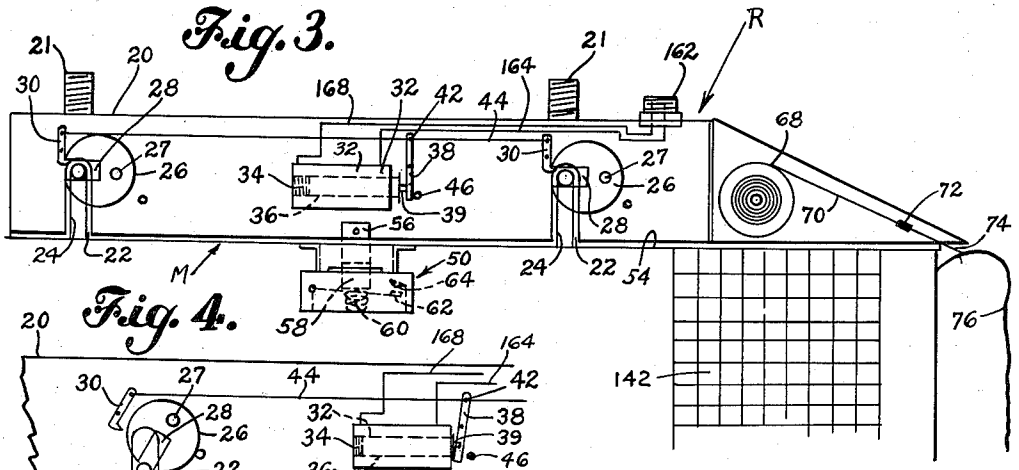
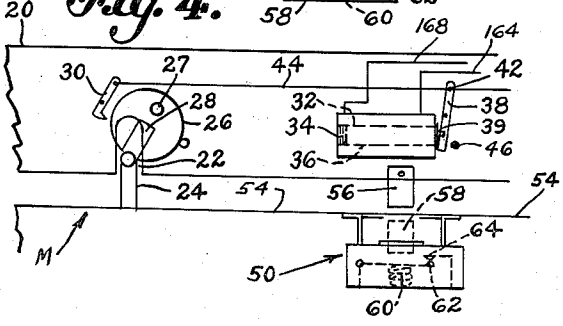


Fig. 4.



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Fig. 5.

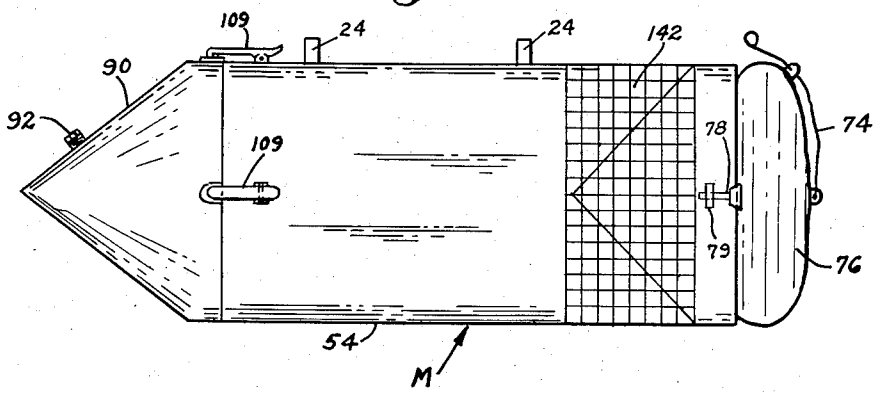
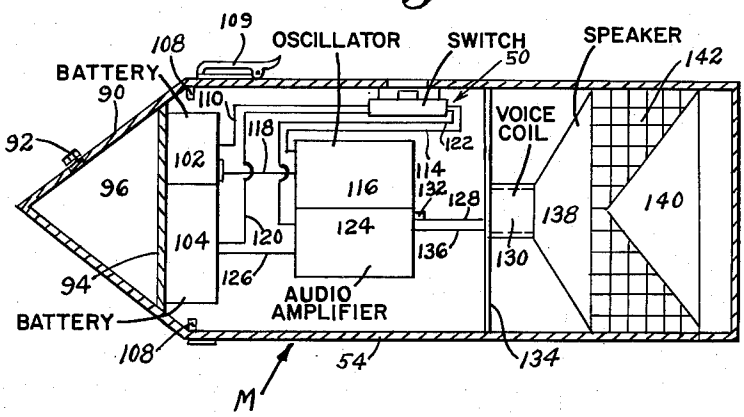


Fig. 6.



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Fig. 7.

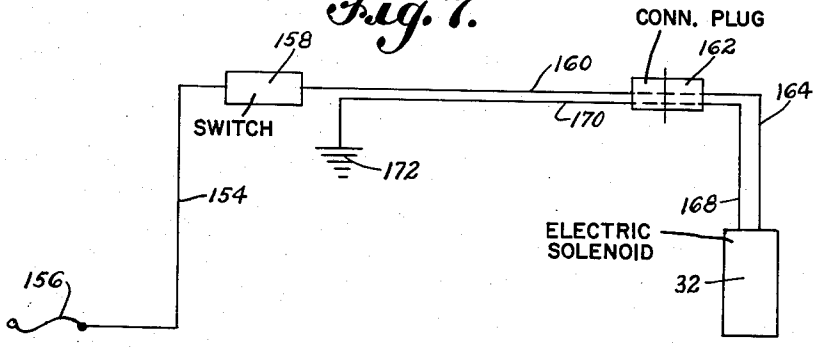
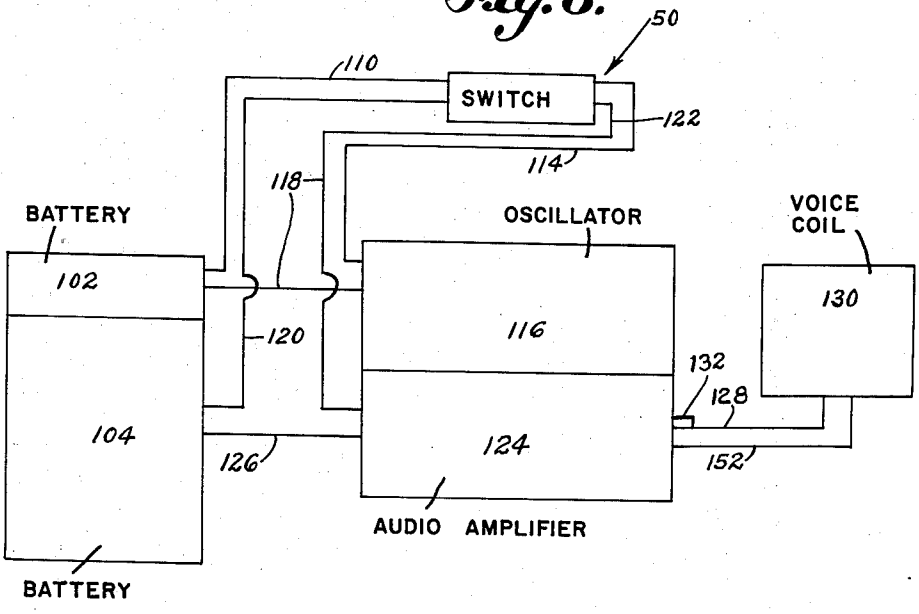


Fig. 8.



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AUTOMATIC SIGNALING DEVICE

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4 Claims. (Cl. 340—366)

This invention relates to an automatic signaling device, particularly one in which a missile capable of emitting sound, can be discharged from an airplane.

Oftentimes there are fires that are difficult to locate by persons on the ground, hence they cannot be reached and extinguished before they make great headway and do considerable damage. Accordingly, one object of my invention is to provide a missile capable of emitting sound, that can be discharged from an airplane in the correct location, and which commences to emit sound when so discharged.

When the airplane pilot sights the fire, he can fly to a point above it, and then release said missile, which will land at or near the fire's location. Then my mechanism provides a continuous sound signal that enables fire fighters to travel directly to the fire, thus avoiding the usual wastage of time trying to locate it.

Another object is to provide said missile with apparatus that is automatically actuated to emit sound, when released from the airplane by release mechanism carried by the latter.

Still another object is to provide mechanism to release said missile that is operated by a simple movement of a switch, automatically causing a movement of certain mechanism that enables the missile to fall away from the airplane with the sound emitting apparatus in operation.

A further object is to provide such automatic apparatus that is relatively simple to install on an airplane, and operate by means of the usual electrical system with which the airplane is equipped.

A still further object is to provide simple means for connecting said missile to the release mechanism, whereby the missile may easily be attached to the release mechanism and firmly held until said mechanism is actuated.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and operative arrangement of parts such as is disclosed by the drawings. The nature of the invention is such as to render it susceptible to various changes and modifications, and therefore, I am not to be limited to the construction disclosed by the drawings nor to the particular parts described in the specifications; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawings:

Fig. 1 is a fragmentary front elevational view of an airplane carrying my automatic signaling device.

Fig. 2 is a fragmentary, side elevational view of an airplane carrying my automatic signalling device.

Fig. 3 is a side elevational view of my release mechanism with the outer casing removed, showing the release mechanism in locked position.

Fig. 4 is a fragmentary, side elevational view, similar

to Fig. 3, omitting the parachute apparatus, showing the release mechanism in discharge position.

Fig. 5 is a side elevational view of the missile apparatus.

Fig. 6 is a longitudinal sectional view of said missile apparatus.

Fig. 7 is a wiring diagram of the electrical system, for the release mechanism, shown connected to the airplane electrical system.

Fig. 8 is a wiring diagram of the electrical system for the missile apparatus.

As illustrated, my device is mounted on a wing 10 of an airplane A supported by the usual struts 12 and having the usual landing gear 14 and wheels 16.

The release mechanism R for the missile M has a housing or casing 20 mounted on the airplane by studs 21. Said casing 20 has two openings 22 in the bottom. Hangers 24, which are attached to said missile M, enter said openings and slide into slots 28 in rotating cams 26 rotatably mounted on shafts 27 supported by said casing 20. Two latching members 30 enter said cam slots 28 and thereby retain the cams 26 in locked (horizontal) position shown in Fig. 3.

An electric solenoid 32, connected to the usual airplane electrical system, is supported by said casing. It has a compression spring 34 bearing against a plunger 36 that is connected to a pivotally mounted lever 38 by a pin 39 freely extending into a slot in said lever. This lever 38 is fixedly connected as at 42 to an elongate, actuating rod 44 that extends to and is pivotally connected with said latching members 30. When the spring 34 is in normal position, said actuating rod 44 keeps said latching members 30 in said cam slots 28 thus holding the cams 26 in predetermined locking position. A stop pin 46 supported by said casing 20 limits the outward movement of said solenoid plunger 36.

When the release mechanism is open, the cam slots 28 communicate with said casing openings 22, ready to receive said missile M. Said release mechanism hangers 24 can enter said openings, thus causing said cams 26 to rotate to a position where said latching members 30 enter said cam slots 28, thus mounting and holding the missile, as shown in Fig. 3, until it is intentionally released. As this mounting action occurs a switch assembly 50, carried by said missile, is functioning. This switch assembly is mounted in a missile main housing 54 that is filled with foam rubber or other shock absorber. There is a round probe member 56 fixedly mounted in the lower portion of the release member casing 20 and which is normally spaced from a switch actuator 58 wholly within said missile housing 54 at all times and it forms part of said switch assembly 50.

When attaching the missile M to said housing 20, said probe member 56 depresses said switch actuator 58, thus compressing a coil spring 60 in said switch assembly 50. This action moves a contact point 62 away from a contact point 64, in said switch assembly, thus breaking the electrical circuit in said missile, as shown in said Fig. 3, which keeps said missile inactive.

At the rear of said release mechanism housing 20, there is a spring loaded reel 68 connected to which is a static line 70. A coupling 72 is attached to said line 70 and to a rip cord 74 connected to a parachute 76. When the missile M drops, said reel 68 plays out said static line 70 until said rip cord 74 effects the opening of said parachute 76. Said reel 68 then automatically winds said static line 70. A snap ring 78 is shown attached to said parachute 76, and extending therefrom is a holder 79 attached to said housing 54.

Said missile M has a removable nose housing 90 which provides a chamber 96 to hold water as a ballast, and

which has a removable plug 92. A bulkhead 94 separates said water chamber 96 from said main housing 54, in which there are power pack batteries 102 and 104. Between said nose housing 90 and said main housing 54 is a rubber seal 108 that makes a water tight connection between the two housings. The nose housing 90 is attached to the main housing by well known fastening means 109.

A positive supply wire 110 extends from said battery 102 to said switch assembly 50. A wire 114 extends between said switch assembly 50 and an electrical oscillator 116, and another wire 118 extends from the latter to said battery 102. A wire 120 extends from said battery 104 to said switch assembly 50 from which a wire 122 extends to a transistorized audio amplifier 124. Another wire 126 extends from the latter to said battery 104.

A lead wire 128 connects with a voice coil 130 and with a disconnect plug 132 that is connected to said amplifier 124. This wire 128 passes through a water-tight bulkhead 134 in said main housing 54 and is sealed by a rubber seal. Another wire 136 extends from said coil 130 to said amplifier 124.

The usual speaker horn 138 is connected to said voice coil 130, and beyond said horn is a sound baffle 140 which extends into a mesh section 142 within said housing 54, that improves the emerging sound.

The constant changing pitch and frequency signal generated by said relaxation oscillator 116 passes into said audio amplifier 124 and thence through said wire 128 to said voice coil 130.

When the missile M is mounted on the release mechanism R, the batteries 102 and 104 may be later placed in said nose housing 90 when needed.

The wiring diagram for the electrical release mechanism is shown in Fig. 7. A wire 154 is connected to the aircraft electrical system through a fuse 156, which wire 154 extends to a push button switch 158. A wire 160 extends from said switch 158 to a connector plug 162 from which a wire 164 extends to said electric solenoid 32, Electrical current is returned from said solenoid 32 through a wire 168 to said connector plug 162 and wire 170 to a ground 172 on the aircraft frame.

When said switch 158 is moved to admit electrical current to said solenoid 32, movement of said plunger 36 is effected to actuate said rod 44 thus moving said latching members 30 out of said cam slots 28. This frees said cams 26, which move to a position, such as shown in said Fig. 4, thus releasing the hangers 24, and the missile M drops by its own weight. This separates said probe member 56 and switch actuator 58, resulting in said contact point 62 meeting said contact point 64 to thereby close the electrical circuit through said switch assembly 50 in said missile M. Thus the sound mechanism, previously described, is activated to give the warning signal of a fire or other occurrence in a certain locality.

The falling missile plays out said static line 70 from said reel 68, until a predetermined length is reached, when the weight of the missile pulls the rip cord 74 and the parachute opens. Thereafter the spring loaded reel 68 rewinds the static line 70.

What I claim is:

1. An automatic signaling device comprising release mechanism adapted to be supported by an airplane, a housing having two openings, a missile embodying electrical sound emitting apparatus, two hangers attached to said missile adapted to enter said openings, said release mechanism embodying removable instrumentalities removably attaching said missile to said release mechanism and embodying two cams each having a slot in communication respectively with said openings, means rotatably mounting said cams on said casing, two latching members normally extending into said slots and holding said cams in predetermined position, said hangers extending into said cam slots, an electrical solenoid supported by said casing embodying a compression spring, a plunger against which said spring normally bears, a lever connected to said plunger, an actuating rod connected to said latching members and to said lever and normally holding said latching members in said cam slots, said lever being so positioned that when said solenoid is activated it moves said plunger and rod and said latching members to thereby cause said cam to rotate and free said hangers from said cam slots and housing, electrical supply means connected to and adapted to actuate said sound emitting apparatus, switch apparatus connected to said electrical supply means and said missile sound emitting apparatus and normally open when said release mechanism and missile are attached and adapted to close when they are detached, a parachute connected to said missile, and means removably connecting said parachute to said device.

2. An automatic signaling device comprising release mechanism adapted to be supported by an airplane, a housing having two openings, a missile embodying sound emitting apparatus, two hangers attached to said missile adapted to enter said openings, said release mechanism embodying movable instrumentalities supported by said release mechanism removably attaching said missile to said release mechanism embodying two cams each having a slot in communication respectively with said openings, means rotatably mounting said cams on said casing, two remaining members normally extending into said slots and holding said cams in predetermined position, said hangers extending into said cam slots, electrically actuated means supported by said casing embodying a movable member, a connecting member connected to said retaining members and to said movable member and normally holding said retaining members in said cam slots, said movable member being so positioned that when actuated it moves said connecting member and said retaining members to thereby cause said cam to rotate and free said hangers from said cam slots and housing, electrical supply means connected to and adapted to actuate said sound emitting apparatus, switch apparatus connected to said electrical supply means and said missile sound emitting apparatus and normally open when said release mechanism and missile are attached and adapted to close when they are detached, a parachute connected to said missile, and means removably connecting said parachute to said device.

3. An automatic signaling device comprising release mechanism adapted to be supported by an airplane, a housing having two openings, a missile embodying electrical sound emitting apparatus, two hangers attached to said missile adapted to enter said openings, said release mechanism embodying movable instrumentalities removably attaching said missile to said release mechanism embodying two cams each having a slot extending horizontally in normal position and in communication respectively with said openings, means rotatably mounting said cams on said casing, two angular latching members normally extending into said slots and holding said cams in predetermined position, said hangers extending into said cam slots, an electrical solenoid supported by said casing embodying a compression spring, a plunger against which said spring normally bears, a lever connected to said plunger, an actuating rod connected to said latching members and to said lever and normally holding said latching members in said cam slots, said lever being so positioned that when said solenoid is activated it moves said plunger and rod and said latching members to thereby cause said cam to rotate and free said hangers from said cam slots and housing, electrical supply means connected to and adapted to actuate said sound emitting apparatus, switch apparatus connected to said electrical supply means and said missile sound emitting apparatus and normally open when said release mechanism and missile are attached and adapted to close when they are detached, a parachute connected

to said missile, and means removably connecting said parachute to said device.

4. An automatic signalling device comprising release mechanism adapted to be supported by an airplane, a housing having two openings, a missile embodying electrical sound emitting apparatus, two hangers attached to said missile adapted to enter said openings, said release mechanism embodying movable instrumentalities removably attaching said missile to said release mechanism embodying two cams each having a slot in communication respectively with said openings, means rotatably and eccentrically mounting said cams on said casing, two latching members normally extending into said slots and angularly beyond said cams and holding said cams in predetermined position, said hangers extending into said cams lots, an electrical solenoid supported by said casing embodying a compression spring, a plunger against which said spring normally bears, a lever connected to said plunger, an actuating rod connected to said latching members and to said lever and normally holding said latching members in said cam slots, said lever being so positioned that when said solenoid is activated it moves

said plunger and rod and said latching members to thereby cause said cam to rotate and free said hangers from said cam slots and housing, electrical supply means connected to and adapted to actuate said sound emitting apparatus, switch apparatus connected to said electrical supply means and said missile sound emitting apparatus and normally open when said release mechanism and missile are attached and adapted to close when they are detached, a parachute connected to said missile, and means removably connecting said parachute to said device.

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