

March 23, 1937.

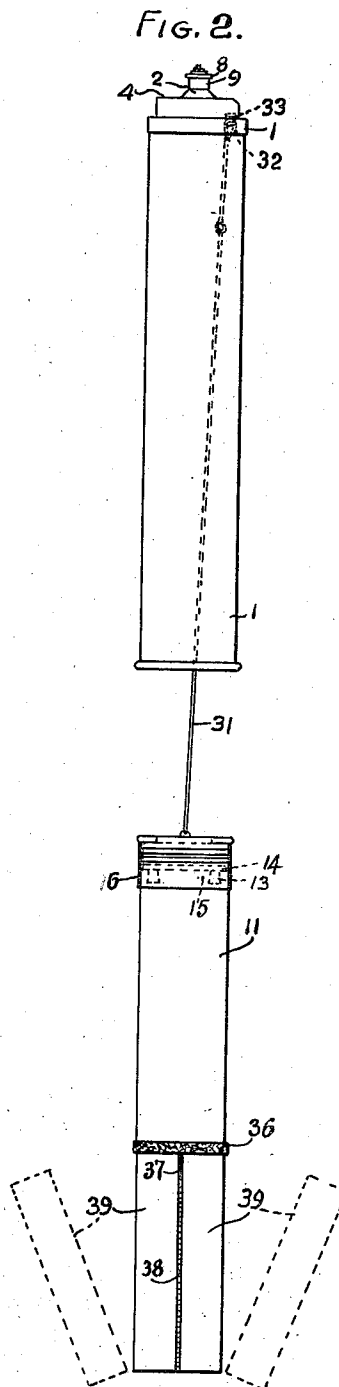
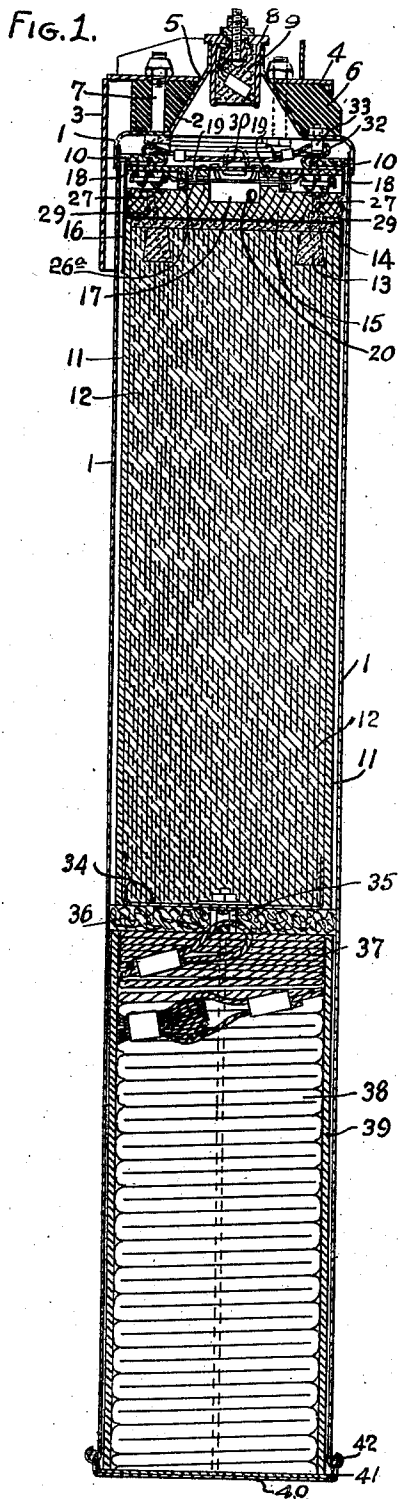
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2,074,683

FLARE

Filed June 4, 1934

3 Sheets-Sheet 1



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FIG. 3.

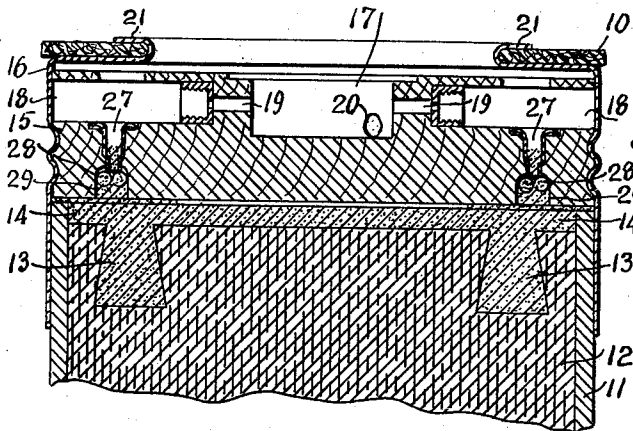


FIG. 4.

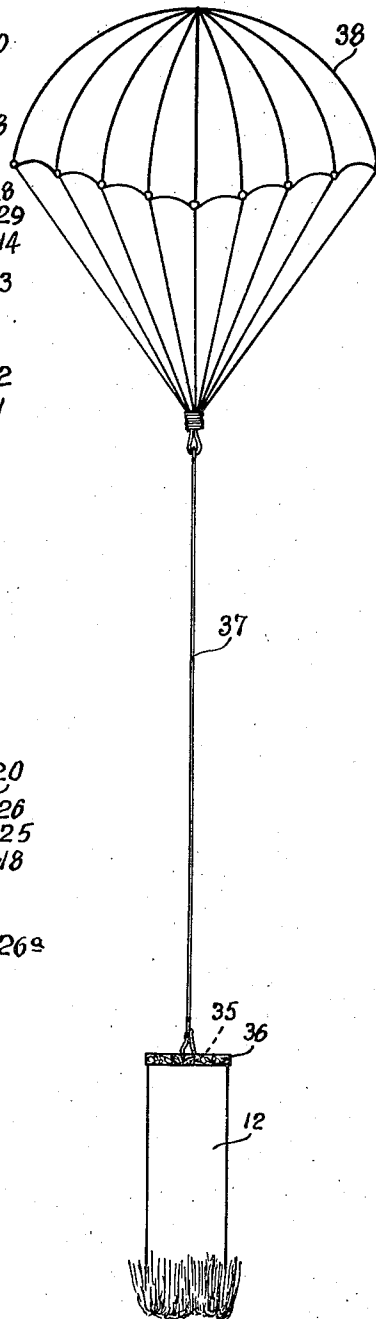
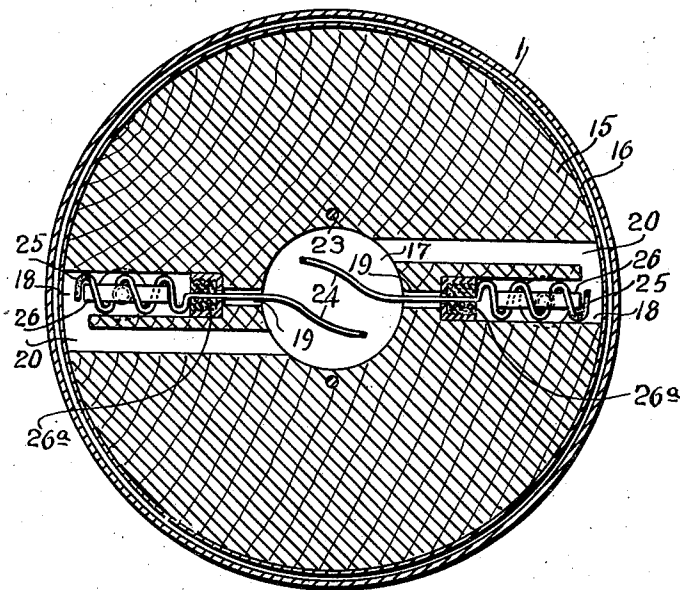


FIG. 5.



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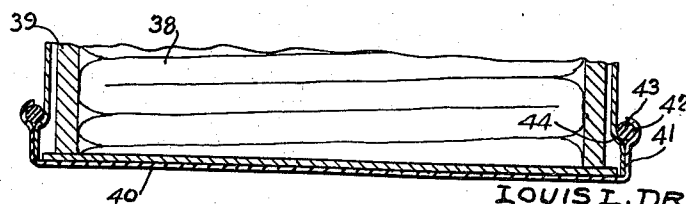
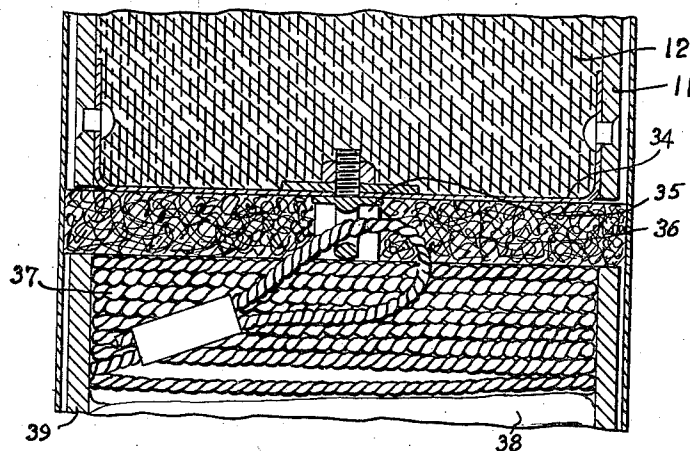
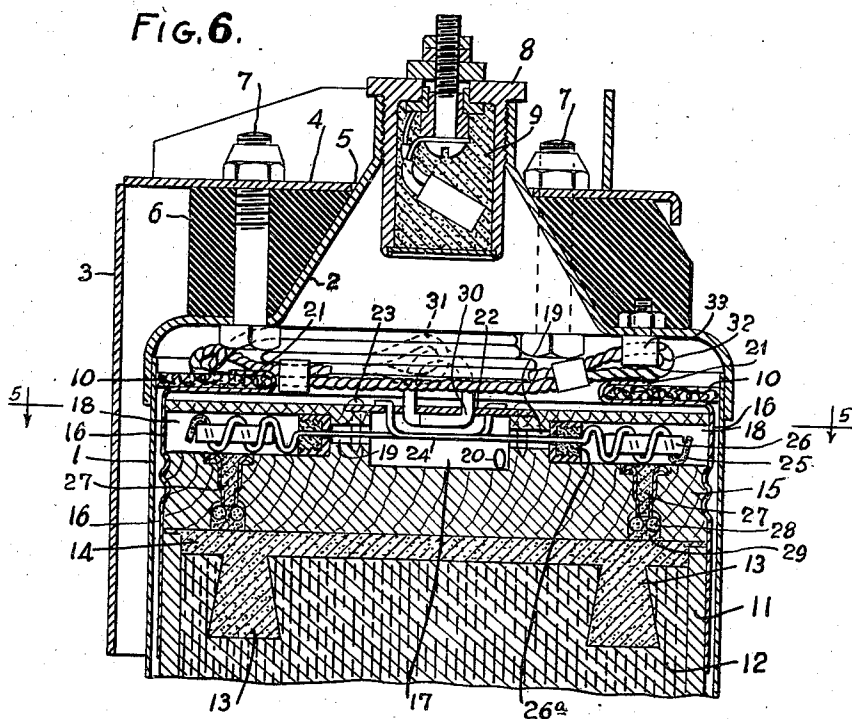
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FIG. 6.



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UNITED STATES PATENT OFFICE

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FLARE

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Application June 4, 1934, Serial No. 728,830

10 Claims. (Cl. 102-24)

This invention relates to improvements in flares, and has for its object to provide a flare adapted to be discharged from an airplane in such a manner that the igniting of the flare will take place at some distance from the airplane.

It is an object of this invention to provide a flare tube, with means for discharging the candle therefrom and causing it to ignite after the candle has passed from the mouth of the tube some distance.

It is also an object of the invention to provide, in connection with an airplane, means for supporting and discharging a flare so there is first ignited a time fuse, which serves to ignite the candle material which is supported by means of a parachute, suitably attached to the candle material. It is my particular object to provide a flare which is driven, with its parachute, without being ignited from the tube; I particularly prefer an explosive for driving the flare and its parachute from the tube. I also particularly prefer a hermetically sealed tube which can be only successfully opened by the explosion of the powder, constituting the expelling means, and the flare candle and its parachute thrust member must be of such character as to drive off the hermetical seal of the tube.

The second particular object of my invention is to initiate the firing of the flare only after the flare and its parachute have completely cleared the tube so there can be no ignition of the flare within the tube.

The third particular object of my invention, as a further precaution, is to ignite only a time fuse by the firing means, which is first initiated after the tube has been evacuated. This fuse permits the parachute and its flare several seconds of travel in order to completely clear the plane before the ignition composition is ignited on the end of the flare candle to blow off the cap and ignite the candle. I thus insure absolute functioning and delay of functioning to entirely clear the flare, not only from the tube but also from the vicinity of the plane, before the flare is ignited. This sequence of operations is essential.

By using powder for expelling the flare candle and its parachute I am enabled to operate the flare on a remote place on the plane by using an electric current for initiating the explosion, and therefore avoiding the use of explosives which can be set off by shot or detonation. I am further enabled to have a hermetically sealed tube to prevent the entrance of moisture into the tube as the contents of the tube are hygroscopic. By preventing the entrance of moisture I am enabled

to secure a perfectly uniformly functioning piece of apparatus, uninfluenced by altitude and moisture conditions.

These and other advantages will appear from the following description taken in connection with the drawings.

Referring to the drawings:

Figure 1 is a vertical longitudinal section through the flare tube, the candle and the tube for supporting the parachute in connection with the candle, together with the expelling and igniting instrumentalities.

Figure 2 is a view of the flare tube, similar to that shown in Figure 1 but with the flare candle and the parachute in the first position after being expelled. In this figure the candle and parachute are still connected to the tube by means of a cable but are beneath the lower end of the tube about six inches.

Figure 3 shows the upper end of the candle after the fuse has been ignited through the action of the cable and the weight of the candle.

Figure 4 shows the candle supported by the parachute in open position after the candle material has taken fire.

Figure 5 is a section substantially on the line 5-5 of Figure 6.

Figure 6 is an enlarged vertical section with parts broken away.

For the purpose of supporting and directing the flare and its parachute when it is expelled, there is provided a tube 1, which is cylindrical in shape and has at its upper end a funnel-shaped crown-piece 2, which extends upwardly. For the purpose of supporting the tube there is provided, on some suitable part of the airplane or other structure, a bracket 3 which has a top plate 4 provided with a hole or opening 5 through which the crown-piece 2 extends.

Between the top plate 4 and the upper end of the tube and around the crown-piece is a rubber ring 6, adapted to deaden the recoil when the candle and parachute are expelled. The tube is held on the bracket by means of bolts 7 which pass through the upper part of the tube and the top plate 4. In the crown-piece is a cylindrical hollow plug 8, which has therein an expelling charge 9 and suitable means for igniting the charge for expelling the flare. Adjacent the upper end of the tube and spaced from the crown-piece is an annular gasket 10. In the upper end of the tube and spaced from the gasket 10 is a container 11 having therein candle material 12.

Embedded in the upper end of the candle ma-

terial are primer pellets 13, while on top of the candle material and these pellets is a primer layer 14, which has thereon a wooden block 15, in the center of which is a cavity 17. Between the cavity and the periphery of the wooden block are two or more pockets 18 connected to the cavity by means of holes 19. The peripheral ends of the pockets 18 are connected to the cavity 17 by means of vent passageways 20.

10 The upper end of the container 11 has fitting over it a cap 16, which has an upper part extending inwardly between the wooden block and the gasket and spun at 21 over the gasket 10. The cavity 17 is covered by means of a round disc or plate 22 held on the wooden block by means of small nails 23. Extending from the plate 22 are wires 24, one for each slot, extending from the cavity through the hole 19, into the slot.

20 The end of the wire within the slot is coiled and has thereon a striking composition 25, which ignites the match head composition 26a when pulled through it. A quick match material 26 increases the flame to insure the ignition of a delay fuse 27 located in vertically disposed holes in the wooden block. These fuses are two-second fuses. That is, after burning two seconds they will ignite a quick match material 29 located in a channelway 28 in the bottom of the wooden block adjacent the primer layer 14.

30 The plate 22 has attached thereto a clip 30 to which one end of a wire cable 31 is attached. The other end of this wire cable is attached to one end of a piece of stranded wire flexible cable 32, which has its other end attached to a detachable metal head 33 supported in the upper end of the tube beneath the rubber ring 6. The flexible cable prevents the kinking of the cable 31. The cables are positioned beneath the crown-piece and above the gaskets 10 when the parts are in position for expulsion. The lower end of the container 11 is closed by means of a closure 34, which has attached thereto an eye 35 which extends through a hole in a felt partition 36.

45 To this eye 35 is attached one end of a cable 37, to the other end of which is attached in the usual manner the parachute 38 housed in the lower end of the tube beneath the felt partition 36. This parachute in its folded condition is inclosed within the lower end of the tube, and has around it a tube or container composed of two semi-circular parts 39. These parts are made of pasteboard or some similar material, and serve as a thrust block for forcing the closure 40 from the lower end of the tube. This closure 40 has a peripheral flange 41 provided with a groove 42 for containing a rubber washer or gasket 43, supported in the groove between the flange 41 and the lower peripheral part of the tube. This washer or gasket 43 is supported on the lower end of the tube by means of a shoulder 44, which prevents the closure 40 from being removed without the application of force.

65 Figure 1 shows the flare as supported by some part of the airplane, ready for expulsion. As shown here the flare as a whole is housed within a tube. When it is desired to expel the flare the expelling charge is ignited. This charge is sufficient to force the candle and the parachute from the tube, and also sufficient to force the closure 40 from the lower end of the tube. After the candle and parachute have been expelled from the tube the parts assume the position shown in Figure 2. At this time the upper end

of the candle is about six inches beneath the lower end of the tube, and is ready for the match action to ignite the fuse, and through the fuse the match material and the primer parts.

5 The force of the discharge and the weight of the flare are sufficient to draw the wires 24 through the holes 19, thereby igniting the match materials within the slots. The igniting of the match materials causes the fuses to ignite, which after about two seconds, will cause the match materials in the channelways 28 to ignite and also ignite the primer layer. It requires several seconds to ignite the candle material after the flare has been expelled from the tube. In these several seconds the airplane has left the flare some distance behind so that its burning will in no manner endanger the airplane. After the flare material has become ignited the flare and the parachute assume the position shown in Figure 4.

10 It will be understood that I desire to comprehend within my invention such modifications as come within the scope of my claims and my invention.

25 Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination, a tube, a container in the tube, candle material in the container, primer pellets in the top of the candle material, a primer layer on the pellets and the candle material, a block on the top of the container, said block having a central cavity, slots connected at one end to the cavity and vent passageways from the other ends of the slots to the cavity, a fuse extending from each slot to the primer layer, means to expel the container and candle material from the tube, and means to ignite the fuses after the container has left the tube.

2. In combination, a tube, a container in the tube, candle material in the container, primer pellets in the top of the candle material, a primer layer on the pellets and the candle material, a block on the top of the container, said block having a central cavity, slots connected at one end to the cavity and vent passageways from the other ends of the slots to the cavity, a fuse extending from each slot to the primer layer, means to expel the container and candle material from the tube, and means to ignite the fuses after the container has left the tube, said last-named means including match material in the slots and strikers extending from the tube through the cavity into the slots.

3. In combination, a tube, a container in the tube, candle material in the container, primer pellets in the top of the candle material, a primer layer on the pellets and the candle material, a block on the top of the container, said block having a central cavity, slots connected at one end to the cavity, and vent passageways from the other ends of the slots to the cavity, a fuse extending from each slot to the primer layer, means to expel the container and candle material from the tube, and means to ignite the fuses after the container has left the tube, said last-named means including a plate on the cavity, means to connect the plate to the tube, match material in the slots, and strikers extending from the plate into the slots.

4. In combination, a tube, a candle material and container therefor in the tube, a block on the container, said block having therein a cavity, slots, each slot being connected at one end to the cavity, a vent passageway from the other

end of each slot to the cavity and a fuse extending from each slot to ignite the candle material, and means acting in the slots to ignite the fuses.

5. In combination, a tube, a candle material and container therefor in the tube, a block on the container, said block having therein a cavity, slots, each slot being connected at one end to the cavity, a vent passageway from the other end of each slot to the cavity and a fuse extending from each slot to ignite the candle material, and means acting in the slots to ignite the fuses, said means including a match material in the slots and strikers connected to the tube.

6. In combination, a tube, a candle material and container therefor in the tube, a block on the container, said block having therein a cavity, slots, each slot being connected at one end to the cavity, a vent passageway from the other end of each slot to the cavity and a fuse extending from each slot to ignite the candle material, and means acting in the slots to ignite the fuses, said means comprising a plate over the cavity, means to connect the plate to the tube and strikers extending from the plate into the slots.

7. In a flare, a hermetically sealed tube, means for expelling the flare and a parachute connected thereto from the tube and simultaneously rupturing the hermetical seal, means to ignite the flare after it leaves the tube and clears the plane by travelling a predetermined distance from the plane, explosive means within the tube adapted to drive the flare and its parachute from the tube, thrust means protecting the parachute interposed between the hermetical seal of the tube and the flare, means mechanically connecting said flare to the tube adapted to initiate the

ignition of the flare only after the flare has left the tube, and a delay action fuse ignited by said ignition means adapted to ignite the flare after it has left a plane to which the tube is attached an appreciable interval.

8. In a flare, a tube attached to a plane, means in the tube to expel the contents thereof, a flare and parachute in the tube, said flare being connected by a cable to the tube, the cable being longer than the tube, a time fuse connected to the flare, and means to ignite the fuse after the flare leaves the tube and the cable is extended to its full length, and an ignition means actuated only when the cable is extended to its full length and the flare is outside of the tube and a predetermined distance therefrom.

9. In a flare, a tube adapted to contain a flare, a flare and parachute in the tube, an explosive adapted to drive the flare and parachute from the tube without igniting the flare, means to prevent the ignition of the flare, and mechanical means attached to the tube and the flare for initiating the lighting of the flare after it leaves the tube and at a predetermined distance therefrom.

10. In a flare, a tube adapted to contain a flare, a flare and parachute in the tube, an explosive adapted to drive the flare and parachute from the tube without igniting the flare, means to prevent the ignition of the flare, mechanical means attached to the tube and the flare for initiating the lighting of the flare after it leaves the tube, and a time fuse ignited by said ignition means and adapted to ignite the flare after an appreciable interval of becoming detached from the tube and the mechanical means.

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