Aug. 7, 1945. M. W. LLOYD 2,381,130

AIRCRAFT PYROTECHNIC

Filed Jan. 25, 1943

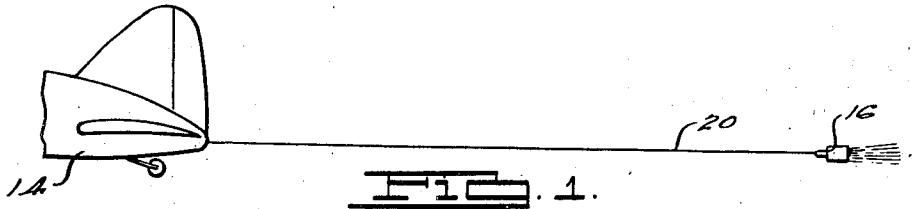


FIG. 1.

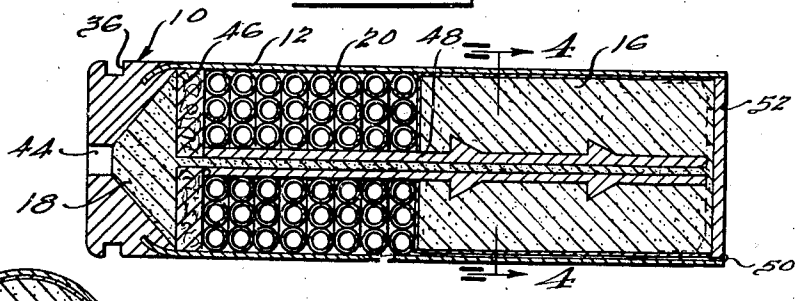


FIG. 3.

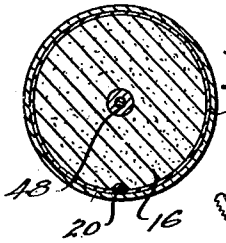


FIG. 4.

FIG. 2.

FIG. 6.

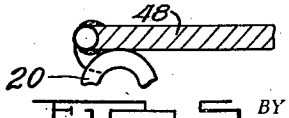


FIG. 5.

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Patented Aug. 7, 1945 2,381,130

UNITED STATES PATENT OFFICE

2,381,130

AIRCRAFT PYROTECHNIC

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Application January 25, 1943, Serial No. 473,568

3 Claims. (Cl. 102—32)

This invention relates to aircraft pyrotechnics and has particular reference to a means for signaling from a moving vehicle or craft.

A principal object of the invention is to provide a new and improved means for signaling from a rapidly moving craft such as an airplane.

Because of the speed with which aircraft now move, under some conditions—such, for example, as when a number of aircraft are maneuvering—it is very difficult, if not impossible, to correlate a particular pyrotechnic signal with the craft from which it was fired.

This invention contemplates the provision of a pyrotechnic signal which may be trailed from such a craft and in relatively close proximity thereto so as to make it possible to correlate the signal with the craft from which it was fired.

A further object of the invention, therefore, is to provide a new and improved means for signaling from a rapidly moving craft which consists of a pyrotechnic signal which is adapted to be trailed behind such a craft.

Another object of the invention is to provide a pyrotechnic signal comprising a part which is adapted to be releasably anchored to the craft and a combustible flare connected to such part by a line which limits the travel of the flare relative to the part so as to enable the burning flare to be trailed behind the vehicle or craft.

Another object of the invention is to provide a pyrotechnic signal of the type herein disclosed consisting of a cartridge having a combustible flare and a line arranged therein.

Other objects and advantages of the invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawing, of which there is one sheet and wherein:

Fig. 1 is a view of a part of an aircraft in flight with a burning flare trailing therebehind for recognition or signaling purposes;

Fig. 2 is an elevational view with parts shown in section of one type of discharger which might be provided in the aircraft for discharging the pyrotechnic signal;

Fig. 3 is a longitudinal sectional view of one embodiment of a pyrotechnic signal before being discharged;

Fig. 4 is a sectional view taken in a plane along the line 4—4 of Fig. 3, looking in the direction of the arrows,

Fig. 5 is a fragmentary sectional view illustrating the manner in which the line is connected to the flare projectile; and

Fig. 6 is a fragmentary sectional view illustrating the manner in which the other end of the line is connected to the projectile case.

The pyrotechnic signal herein disclosed comprises a means for signaling from a rapidly moving vehicle or craft and consists in general of a signal cartridge indicated generally at 10. The cartridge includes an expendable case 12 which is adapted to be releasably anchored to the vehicle or craft 14, and a projectile 16 in said case and adapted to be ejected therefrom, such projectile comprising a combustible flare which is adapted to be ignited when ejected from said case. Means consisting of a powder charge 18 are provided in the case for ejecting the projectile therefrom, and a line 20 connected to said case and to said projectile is provided for limiting the travel of the flare 16 relative to the case 12 during the burning of the flare so as to trail the burning flare behind and in relatively close proximity to said vehicle or craft.

The case 12 may be made to fit within the barrel 24 of a signal discharger 26 removably mounted in a recoil mount 28 carried by the wall 30 of the craft 14. The discharger 26 may comprise a breech-loading single shot firearm and have firing mechanism including a firing pin actuated and released by a trigger 32. The specific form of discharger and mount form no part of the present invention, but are illustrated merely for the purpose of indicating one mode of discharging the signal cartridge herein disclosed and of anchoring the burning flare to the craft.

The signal discharger includes a latch 34 adapted to engage the rim 36 of the cartridge 10 which, as illustrated, is of the inner rim type of ammunition. When the discharger 26 is mounted in the mount 28, upon unlocking the breech by manipulation of the breech lock 38 the breech block and handle of the discharger will pivot about the pivot 40 relative to the barrel 24, thereby exposing the breech end of the barrel and the cartridge 10 therein. Upon this relative movement between the handle of the discharger and the barrel 24, an extractor mechanism of which the latch 34 is a part will move the cartridge case 12 rearwardly in the barrel whereby the latch 34 may be separated from the rim 36 and the shell 12 of the expended cartridge may be pushed forwardly through the gun barrel 24 and mount 28 in order to enable another cartridge to be loaded therein.

The discharger illustrated is disclosed in an application Serial No. 447,292, filed by Severance et al. on June 16, 1942, for "Flare pistol," Patent No. 2,360,168, Oct. 10, 1944.

The base of the cartridge has a primer 44 therein adapted to be set off by the firing pin of the discharger, and this primer is adapted to ignite the powder charge 18 contained in the base of the shell. A washer 46 arranged transversely of the shell next to the powder charge 18 cooperates with the projectile 16 to define a space within the shell 12 within which the line 20 is arranged. The line 20 may consist of an elongated coil of wire which is suitably arranged in the space between the projectile 16 and the washer 46, one end of the wire 20 being anchored to one end of a core 48 which seats against the washer 46.

The core 48 is embedded in the flare composition 16 and is hollow. The hollow center of the core 48 is filled with a slow burning powder which communicates through an opening in the washer with the forward end of the flare composition 16. Upon explosion of the powder charge 18 the powder within the core begins to burn and serves as a fuse for igniting the flare 16. The other end of the line 20 is anchored at 50 to the forward edge of the case 12, which before firing of the cartridge is closed by a disk 52 which functions to retain the flare 16, et cetera within the case 12. The ends of the line 20 may be connected, for example by soldering, to the core 48 of the flare projectile and to the shell 12 as illustrated in Figs. 5 and 6 respectively.

When the primer 44 is set off, the explosion of the powder ejects the projectile 16 and the wire 20 from the case, the wire 20 unwinding until it is taut and thus serving to limit the travel of the projectile 16 relative to the case 12. The line 20 may be formed of wire or any suitable material. Fig. 1 illustrates the manner in which the burning flare 16 is anchored by the wire 20 to the craft 14 through the medium of the case 12 which is anchored within the discharger 26 by the latch 34.

While this pyrotechnic signal is illustrated in connection with an aircraft, it might be used in connection with any other kind of a moving craft, such as a ship or land vehicle, and it might be used even from a stationary place or craft when desirable.

While the invention has been described with some detail, it is to be understood that the description is for the purpose of illustration only and is not definitive of the limits of the inventive idea. The right is reserved to make such changes in the details of construction and arrangement of parts as will fall within the purview of the attached claims.

I claim:

1. Means for signalling from an aircraft having a signal discharger provided with a latch, a signal cartridge comprising an expendable case adapted to be arranged in and releasably anchored to said discharger by means of said latch, a projectile in said case adapted to be ejected therefrom and comprising a combustible flare provided with means for igniting said flare upon being ejected from said case, means for ejecting said projectile from said case and arranged in said case between the base thereof and said projectile, and a line connected to said case and to said flare so as to limit the travel of said flare relative to said case during the burning of said flare so as to trail said burning flare behind and in sufficiently close proximity to said aircraft so as to identify said flare with said aircraft.

2. Means for signalling from an aircraft having a signal discharger provided with a latch, a signal cartridge comprising an expendable case adapted to be arranged in and releasably anchored to said discharger by means of said latch, said case having a powder charge in the base thereof, a projectile comprising a combustible flare provided with means for igniting said flare upon being ejected from said case, said flare having a rearwardly extending stem projecting therefrom, a washer arranged transversely of said case adjacent said powder charge, the rear end of said stem being seated against said washer, and a line connected to said stem and to said case so as to limit the travel of said flare relative to said case during the burning of said flare so as to trail said burning flare behind and in sufficiently close proximity to said aircraft so as to identify said flare therewith.

3. The invention as defined in claim 2 in which said line is arranged in a coil in said case before the discharge of said signal and between said washer and said flare.

MILBY W. LLOYD.