Jan. 16, 1951 C. D. SCHERMULY ET AL 2,538,333

SIGNAL OR SMOKE ROCKET

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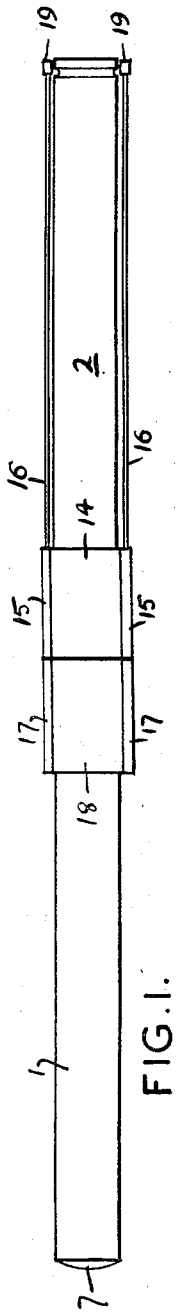

FIG. 1.

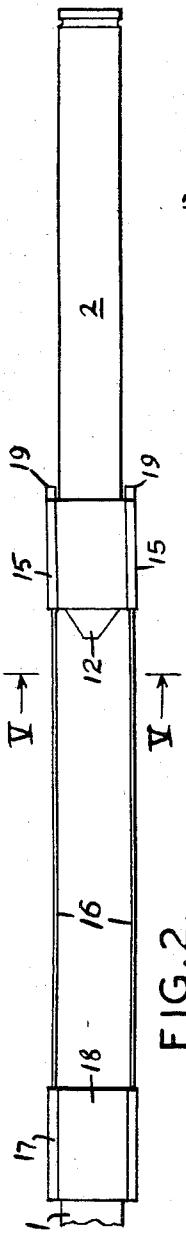

FIG. 2.

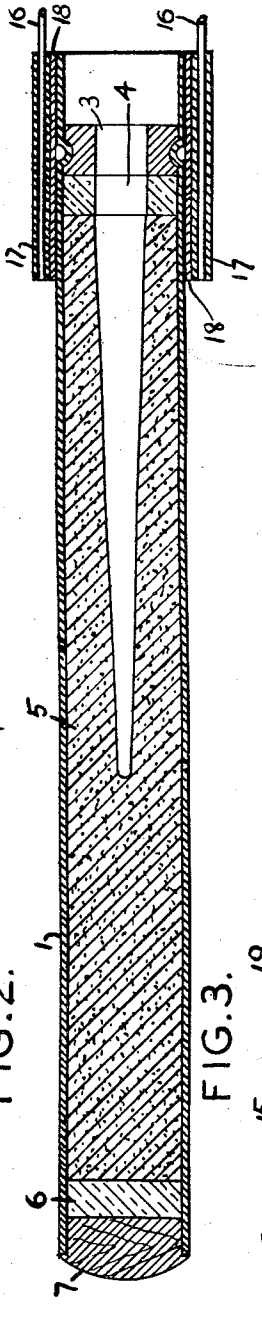

FIG. 3.

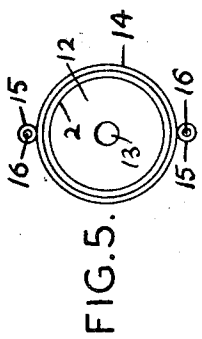

FIG. 5.

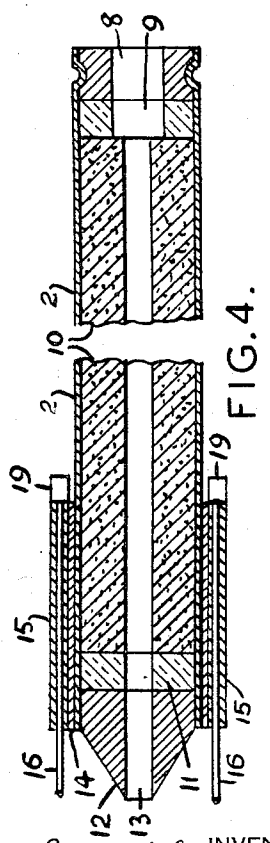

FIG. 4.

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SIGNAL OR SMOKE ROCKET

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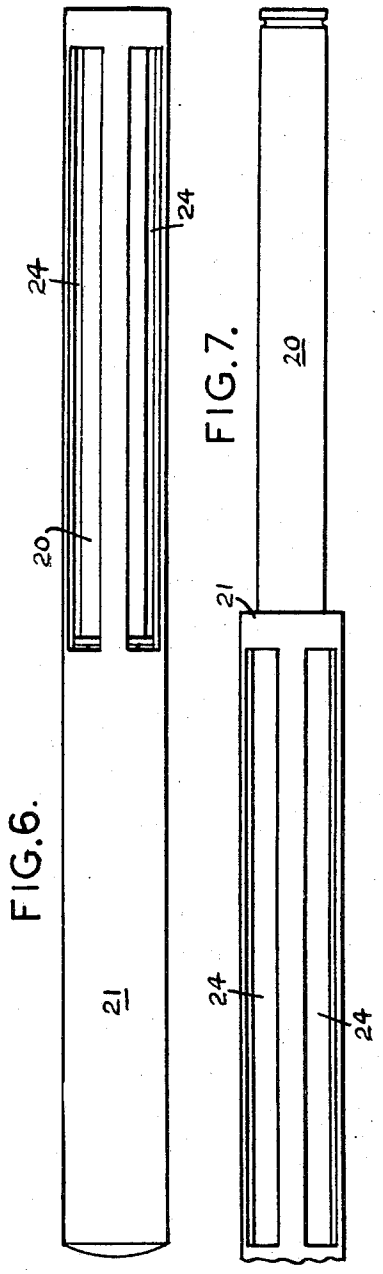

FIG. 6.

FIG. 7.

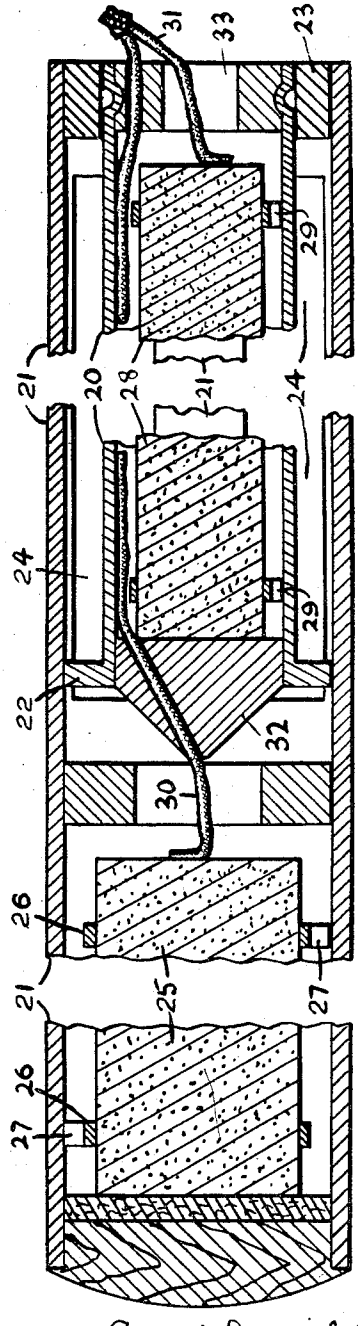

FIG. 8.

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SIGNAL OR SMOKE ROCKET

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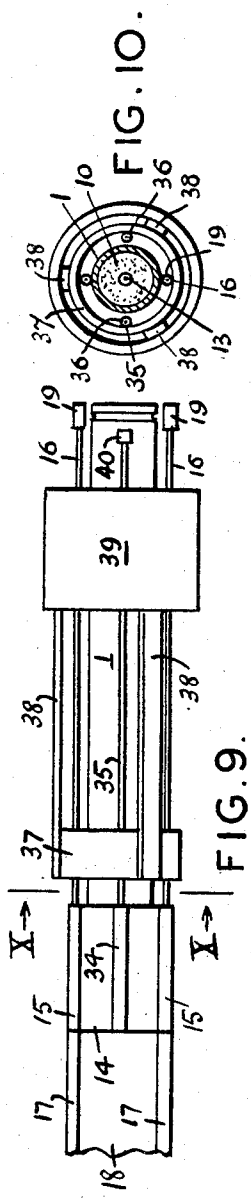

FIG. 9.

FIG. 10.

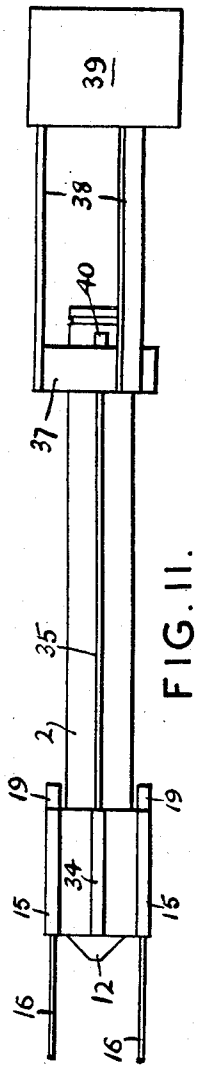

FIG. 11.

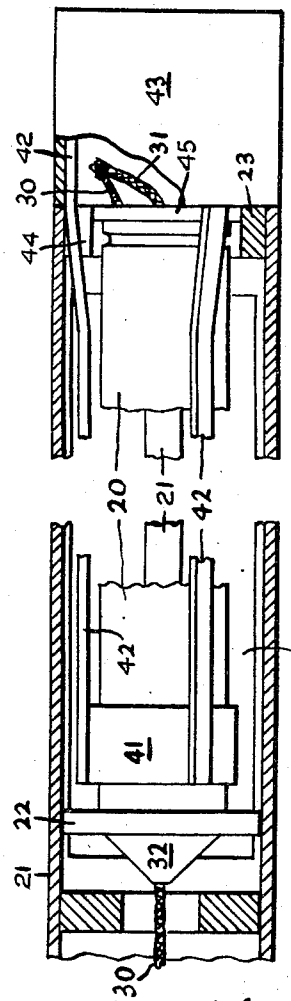

FIG. 12.

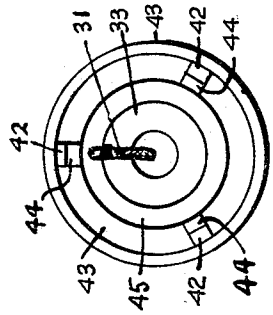

FIG. 13.

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Patented Jan. 16, 1951 2,538,333

UNITED STATES PATENT OFFICE

2,538,333

SIGNAL OR SMOKE ROCKET

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Application October 30, 1947, Serial No. 783,023
In Great Britain October 30, 1946

2 Claims. (Cl. 102—34.5)

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This invention relates to signal or smoke rockets of the kind comprising a signal, illuminating or smoke flare.

It is already known to provide a signal or smoke flare in the head of a rocket, the said flare being ignited from the rocket composition towards the end of the flight of the rocket.

It is sometimes desirable, however, for a rocket to emit illumination, smoke or other signals during the whole of its flight, and it is the object of the present invention to provide a rocket of this kind.

According to this invention a rocket comprises a front and a rear casing, the front casing containing a rocket propellent composition and the rear casing containing a signalling composition. The rear casing is carried by the front casing and is capable of a limited axial sliding movement relative to the front casing. Upon discharge of the rocket the front casing moves forward relative to the rear casing to a limited extent thus maintaining the propellent composition and the signalling composition in a spaced relationship during the flight of the rocket. Prior to discharge the two casings may be moved toward each other to reduce the overall length of the rocket.

The propellent composition is contained in the forward casing and the signalling composition in the rear casing, a hole being provided throughout the length of the signalling composition so that the flash from the cartridge or the like used for firing the rocket can pass through the said hole and ignite the propellent composition at or about the same time as the signalling composition is ignited. Instead of providing a hole through the signalling composition, a space may be left between the signalling composition and the casing so that the flash may pass therethrough. Alternatively a fuze from the rear end of the propellent composition may pass through the said hole or space and be united at the rear end of the casing containing the signalling composition with a second fuze from the rear end of the latter.

The invention will now be described with reference to the accompanying drawings in which:

Figure 1 shows one embodiment of rocket according to the invention,

Figure 2 is a view similar to Figure 1 but showing the casings axially displaced,

Figure 3 is a section on a larger scale of the front casing,

Figure 4 is a section on a larger scale of the rear casing,

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Figure 5 is a view, on a larger scale, taken on the line V—V of Figure 2,

Figure 6 shows a second embodiment of rocket according to the invention,

Figure 7 is a view similar to Figure 6 but showing the casings axially displaced,

Figure 8 is a section on a larger scale, with parts broken away, of the rocket shown in Figure 6,

Figure 9 shows the rear portion of the rocket of Figure 1 provided with a sliding tail,

Figure 10 is a section on the line X—X of Figure 9,

Figure 11 shows the rocket of Figure 9 in extended position,

Figure 12 is a view partly in section of the rear portion of the rocket of Figure 6 with the rear casing provided with a sliding tail, and

Figure 13 is an end view taken from the right of Figure 12.

Referring first to Figures 1 to 5, the rocket comprises a front casing 1 and a rear casing 2, the two casings being capable of axial movement relatively to each other as shown in Figure 2.

The casing 1 contains a choke 3, an annular layer of clay 4, a propellent composition 5 and a clay plug 6 and is closed at the front end by a wooden plug 7.

The casing 2 contains a choke 8, an annular layer of clay 9, a smoke-producing composition 10, a clay plug 11 and is closed by a plug 12 the front face of which is frusto-conical in shape. A central hole 13 is provided through the composition 10, and through the plugs 11 and 12.

The front end of the casing 2 is surrounded by a collar 14 which is secured thereto by welding or by means of screws. Welded to the collar 14 are two sleeves 15 through which pass two rods 16 which are rigidly held in sleeves 17 welded to a collar 18 fixedly secured to the rear end of the casing 1. The sleeves 15 are freely slidable along the rods 16, movement in the rearward direction being limited by stops 19 welded or screwed onto the ends of the rods 16.

When it is desired to fire the rocket, the casing is slipped inside the barrel of a discharger containing a cartridge, the rods 16 being situated outside the said barrel and the collar 14 resting on the front end of the barrel. When the cartridge is fired, the flash therefrom ignites the smoke composition 10 and also passes through the hole 13 and ignites the propellent composition 5. The gases generated by the burning of the propellent composition 10 cause the casing 1 to move forward into the position shown in

Figure 2 in which position the rocket travels through the air emitting smoke through the choke 8 in the rear end of the casing 2 during the whole, or a substantial part, of its flight.

Referring now to Figures 6 to 8, the rear casing 20 is movable axially within the front casing 21. Movement of the casing 20 rearwardly is limited by the abutment of a flange 22 on the front end of the casing 20 against an annular stop 23 fixed in the rear end of the casing 21 by welding or by means of screws.

The rear portion of the casing 21 is provided with four apertures 24 to allow for the escape of the gases generated by the burning of the propellent composition in the casing 21.

The casings 21 and 20 may be charged with propellent and smoke-producing composition in exactly the same way as the casings 1 and 2 in Figures 1 to 5. Alternatively, and as shown in Figure 8, both compositions may be of the kind which burn inwardly from the outer surface, instead of outwardly as in Figures 1 to 5.

Referring to Figure 8, the propellent composition 25 is in the form of a pressed cylinder which is held in spaced relation to the casing 21 by means of bands 26 surrounding the composition 25 and provided with projections 27 to form spiders. The pressed cylinder 28 of smoke-producing composition is similarly supported in the casing 20 by means of spiders 29. Ignition of the compositions 25 and 28 is effected by means of fuzes 30 and 31. The fuze 30, which is attached to the rear end of the composition 25, passes through an orifice in the conical plug 32, through the space between the composition 28 and the casing 20 and out through an orifice in the choke 33.

To fire the rocket, the free ends of the fuzes 30, 31 are ignited and after they have burned through they ignite the propellent composition 25 and the smoke-producing composition 28; the casing 21 then moves ahead of the casing 20 and the rocket assumes the position shown in Figure 7.

Any other suitable signalling composition may be used instead of the smoke-producing composition.

Referring now to Figures 9 to 11, the parts which are the same as in Figures 1 to 5 are designated by the same reference numerals. The collar 14 on the rear casing 1 is provided with two further sleeves 34 in which are rigidly secured rods 35. Freely slidable on the rods 35 are two sleeves 36 (Figure 10) which are secured to the inside of a band 37. Three bars 38 are welded at one end to the outside of the band 37 and at the other end to the inside of a wider band 39, the bands 37 and 39 and the bars 38 together with the sleeves 36 constituting a sliding tail. Stops 40 are welded or screwed onto the ends of the rods 35 to limit the rearward movement of the sliding tail. When the rocket is in flight, the sliding tail occupies the position shown in Figure 11, thus stabilising the flight of the rocket.

Referring now to Figures 12 and 13, the parts which are the same as in Figures 6 to 8 are designated by the same reference numerals.

The sliding tail in this instance is formed of a band 41 slidable on the casing 20 and joined by three bars 42 to a wider band 43. Slots 44 are provided in the annular stop 23 to accommodate the bars 42. A flange 45 is provided at the rear end of the casing 20 to act as a stop to limit rearward movement of the sliding tail on the casing 20.

We claim:

1. A rocket comprising a front casing, a rocket propellent composition within said front casing, rods secured to the front casing, a rear casing slidably carried by said rods, a signalling composition within the rear casing and a passage through the length of the signalling composition in the rear casing whereby the flash from an actuating cartridge may reach and ignite the rocket propellent composition in the forward casing and at the same time ignite the signalling composition, said rear casing being capable of a limited axial sliding movement on the rods, relative to the front casing, whereby upon discharge of the rocket, the front casing moves forward relative to the rear casing to the extent of the limited movement to maintain the two compositions in spaced relationship during the flight of the rocket while prior to discharge the two casings may be moved towards each other to reduce the overall length of the rocket.

2. A rocket as claimed in claim 1 in which the rear casing is provided with a sliding tail.

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CHARLES SCHERMULY.

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