United States Patent [19]

Narvesen et al.

[11] **3,722,413**

[45] **Mar. 27, 1973**

[54] **ARRANGEMENT IN ROCKETS**

[76] Inventors: **Bjarne Narvesen; Edvard Tröen,** both of Raufoss, Norway

[22] Filed: **Sept. 11, 1970**

[21] Appl. No.: **71,611**

[52] **U.S. Cl.** **102/49.2,** 102/49.7

[51] **Int. Cl.** **F42b 13/22**

[58] **Field of Search** 102/49.2, 49.7

[56] **References Cited**

UNITED STATES PATENTS

2,940,391	6/1960	Brandt	102/38
3,487,780	1/1970	Tröen et al.	102/49.2

FOREIGN PATENTS OR APPLICATIONS

716,835	8/1965	Canada	102/49.7

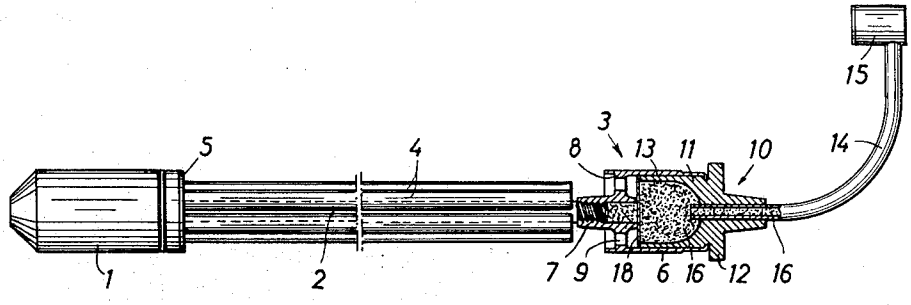
Primary Examiner—Verlin R. Pendegrass

Attorney—Waters, Roditi, Schwartz and Nissen

[57] **ABSTRACT**

A rocket comprises a head and a firing mechanism including a rod to which a nozzle is secured, a plurality of propellant sticks surrounding the rod and anchored to the head, and the nozzle consisting of a ring and a central hub joined to the ring by a web which defines a number of circumferentially spaced bores, the ring having an rearwardly elongated portion forming at the back of the web an elongated cylindrical space and igniter means mounted in said space.

1 Claim, 2 Drawing Figures



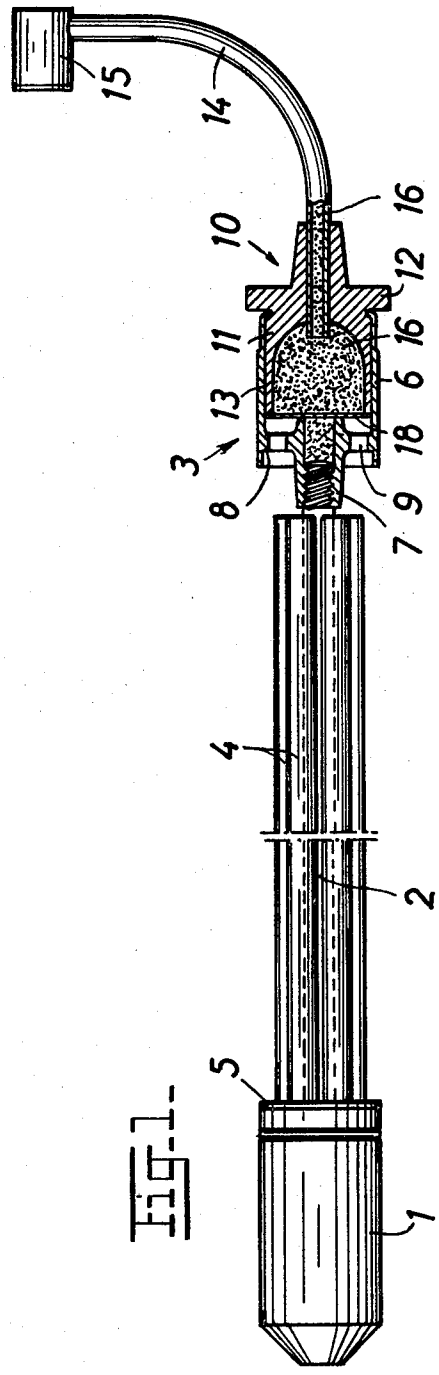


Fig-1-

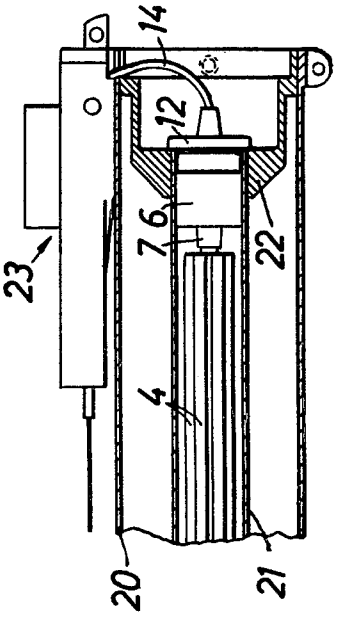


Fig-2-

ARRANGEMENT IN ROCKETS

The present invention relates to an arrangement in rockets particularly, but not exlusively, for subcaliber training systems for an anti-tank weapon.

Rockets for this purpose comprise a cylindrical head, a rod extending rearwardly from said head, a nozzle secured to the rear end of said rod, a number of propellant sticks of explosive arranged evenly spaced around said rod, and means at the rear end of the head anchoring the front ends of said sticks to the head.

When a rocket of the above mentioned type is to be fired from an original launcher, provided in the well known manner with an inner subcaliber launching tube, it is necessary to secure on the nozzle of the rocket, preferably by means of shear pins, a stepped support member which together with usual igniter means had to be secured against a shoulder in the breech end of the launcher tube by means of a threaded lock ring.

This arrangement not only increases the production cost of the rocket but also makes the charging operation more complicated and time consuming, at the same time as it involves a not always safe igniting course.

The object of the present invention is to provide a rocket of the type referred to in which the igniter means are built together with the nozzle of the rocket in such manner that the whole forms a unit which can be inserted directly into the rear end of the subcaliber launching tube without any lock means, so that said rear end of the subcaliber tube may be secured in the tubular section of the launcher proper by means of a single breech.

The arrangement according to the present invention provides also an increased guidance effect and at the same time an obturator or baffle member which in the firing is disengaged and detained.

In order that the invention may be more clearly understood the same will now be described with reference to the accompanying drawing, in which:

FIG. 1 is a side view partly in section of a rocket embodying the invention and

FIG. 2 is a diagrammatical partly sectioned side view of a subcaliber launcher in its extended position with a rocket according to the invention positioned therein.

In the drawing the rocket comprises a head 1, made from steel or other suitable metal, provided at its rear end with a central rearwardly extending steel rod 2 the rear end of which carries steering means such as a nozzle generally denoted 3. The propellant of the rocket, positioned between the steering means 3 and the head 1, consists of a number of sticks 4 of explosive arranged evenly spaced around the rod 2 and having their front ends secured to the head 1 or to a disc 5 secured at the rear end thereof. Thus the propellant is not placed in a particular motor tube as the tubular member of the launcher serves as burning chamber.

The nozzle 3 comprises an outer cylindrical ring 6, a hub 7 threaded on the rear end of the rod 2 and joined with said ring 6 by a web 8 positioned near to the front end of the ring 6. Said web 8 is provided with a number of circumferentially spaced bores 9 through which combustion gases can escape.

The length of the cylindrical ring 6 is so selected that the part thereof at the back of the hub 7 forms an elongated cylindrical space adapted to receive igniter means generally denoted 10. The igniter means comprises a cylindrical plug-shaped container 11 which is inserted through the rear open end of the ring 6 and is provided with an end flange 12 having a greater diameter than that of the ring 6 so that said flange abuts against the end of the ring. The plug 11 is provided with a forwardly open cavity 13, preferably with a hemispherical rear end, which cavity is filled with igniting powder 16 and has its open end closed by means of a thin disc 18 of a material adapted to be readily disintegrated under the influence of the powder gas of firing. The cavity 13 of the plug-shaped member 11 is by means of a flexible tube 14, also filled with igniting powder 16, connected to a member 15 containing a primer and adapted to be inserted in an active position into the firing pin house of a rocket launcher.

In order to fasten the plug member 11 in the cylindrical ring 6 said plug adjacent the flange 12 is provided with a circumferential groove 19 into which the rear, preferably thinned rim portion of the ring 6 is pinched or bent.

FIG. 2 shows a conventional rocket launcher 20 in which is mounted a subcaliber launching tube 21 for use in firing subcaliber rockets of the type above described. Said subcaliber launching tube 21 has its rear end secured in a breech shaped member 22 detachably secured in the rear end of the launcher 20.

In charging the launcher it is only to insert the rocket provided with the igniter 10 directly into the subcaliber launching tube 21 until the flange 12 abuts the rear end of said tube and thereafter the primer member 15 is positioned in active position in the primer chamber of the firing pin housing 23 in conventional manner.

In firing the rocket the plug 11, resting with the flange 12 against the rear end of the tube 21, serves as an obturator or baffle to receive the rearwardly directed forces of the explosive pressure until the cylindrical ring is disengaged and thereby securing that the igniter means 10 is detained.

Due to the extension of the cylindrical ring 6 behind the bores 9 of the nozzle the rocket during its flight obtains an increased stability at the same time as the speed of the rocket may be adapted according to desire with respect to the efficiency of the propellant.

The central hub 7 of the nozzle 3 at the rear end thereof may be provided with a bore adapted to receive a tracer with burning time sufficient for all required ranges.

We claim:

1. A rocket for subcaliber training systems for an anti-tank weapon comprising a head, a rod extending rearwardly from said head, a number of propellant sticks arranged evenly spaced around said rod, means at the rear end of the head anchoring the front ends of said sticks to the head, a nozzle secured to the rear end of said rod, said nozzle comprising a cylindrical ring, a central hub in said ring joined therewith by a web, a plurality of circumferentially spaced bores extending through said web, said rings having a rearwardly elongated portion forming an elongated cylindrical space at the rear of said web and an igniter means mounted in said space, said igniter means comprising a plug-shaped container, an ignition charge in said container, an end flange at the rear end of said plug-shaped container

having greater diameter than that of said ring, a circumferential groove in said plug-shaped container adjacent said flange, a preferably thinned rim portion of said ring pinched into said groove, and a flexible tube connecting said ignition charge to a primer means adapted to be inserted into the firing pin house of a rocket launcher.

* * * * *