Feb. 25, 1941. Y. SEKELLA 2,232,928

EXPLOSIVE PROJECTILE

Filed Feb. 3, 1939

Fig. 2

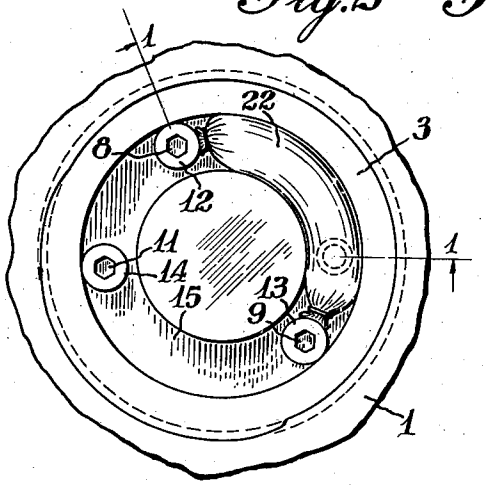


Fig. 3

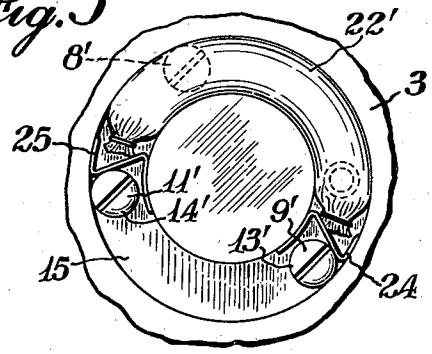
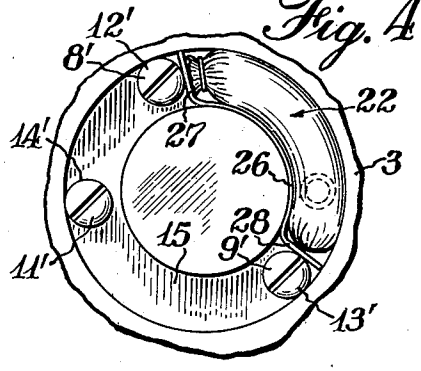


Fig. 4



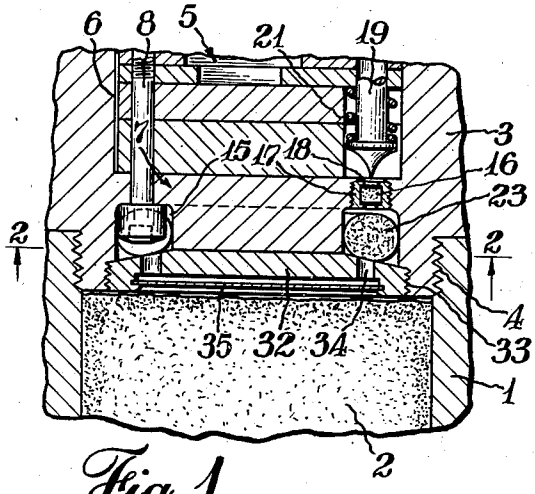
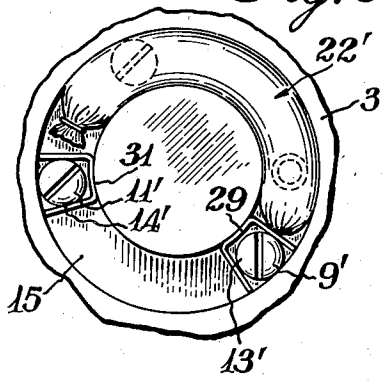


Fig. 1

Fig. 5



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EXPLOSIVE PROJECTILE

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Application February 3, 1939, Serial No. 254,452

3 Claims. (Cl. 102—76)

The present invention relates to explosive projectiles and more particularly to a rifle projectile having a mechanical time fuse.

In explosive projectiles having mechanical timing means for causing detonation thereof, it is customary to use a percussion cap to set off a detonating charge, which in turn explodes the main charge of the shell. The percussion cap is commonly located adjacent the mechanical fuse by which it is controlled, and the detonating charge contained in a bag of textile material such as silk, is placed in a chamber intermediate the percussion cap and the main charge. The chamber for the detonating charge is ordinarily in the form of an annular channel in which the bag of detonating powder is loosely contained.

It has been found in the use of such projectiles that there is a tendency for centrifugal force from the rotation of the shell to segregate the detonating powder in a portion of the chamber which may not be adjacent the percussion cap at the time of the explosion thereof. It is thus possible that there may be no detonating powder directly under the percussion cap at that time, and the flame therefrom may have to travel an appreciable distance before reaching the powder. In such cases, the powder may not ignite so that the shell fails to explode.

It is an object of the present invention to provide a novel explosive projectile in which the detonating powder is positively located so that a portion thereof is directly under the percussion cap.

It is another object to provide such a device in which the anchoring means for the timing mechanism of the fuse is used to confine and locate the container of the detonating powder.

It is a further object to provide such a device in which the locating means is readily interchangeable for adaptation to containers of various sizes.

It is another object to provide such a device incorporating supplemental locating means cooperating with the anchoring means to confine the container of detonating powder.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing in which:

Fig. 1 is a vertical sectional view of a portion of a shell and fuse embodying a preferred form of the invention, the section being taken substantially on the line 1—1 of Fig. 2;

Fig. 2 is a section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a view similar to Fig. 2 showing the invention as adapted to a larger container of detonating powder and also showing the use of retaining clips for the powder bag;

Fig. 4 is a view similar to Fig. 2 showing the use of a single retaining member for the powder bag; and

Fig. 5 is a view similar to Fig. 3 showing another form of retaining clips for the powder bag.

In Fig. 1 there is illustrated a shell or casing 1 containing a main charge 2 of explosive or other mixture to be detonated. A fuse body 3 is rigidly mounted in the upper end of the shell 1 as by means of a threaded connection 4. A timing mechanism indicated generally by numeral 5 is mounted in a cup-shaped opening 6 in the fuse body 3 and is clamped against the bottom 7 of said cup by means of bolts 8, 9 and 11 (Fig. 2) which pass through the bottom of the cup and have heads 12, 13 and 14 extending into an annular channel 15 formed in the bottom of the fuse body 3.

A percussion cap 16 is mounted in the bottom 7 of the cup in the fuse body 3 by means of a thimble 17 threaded in a passage 18 through the bottom of the cup, and a firing pin 19 is arranged to strike and explode the percussion cap under the impulse of a spring 21 when released by the mechanical timing means 5 in any suitable manner, not illustrated.

According to the present invention, a container 22 of detonating powder 23 is mounted in the annular chamber 15 and is confined in the annular chamber to a position under the percussion cap 16 by means of the heads 12 and 13 of bolts 8 and 9, which heads are so formed as to substantially prevent endwise movement of the bag 22 in the channel.

As shown in Fig. 3, when a larger container of detonating powder is used, a bolt 8' may be used having a thin flat head which may be countersunk in its seat, thus allowing passage of the container 22' of detonating powder, which container is accordingly confined in the channel 15 by the heads 13' and 14' of bolts 9' and 11'. As here shown, clips 24 and 25 may be used to completely close the channel and confine the powder bag 22' more closely.

In Fig. 4, the use of a single clip member 26 is shown to confine the powder bag 22, the ends 27 and 28 of the clip serving to close the channel 15 and being in abutting relation with the heads 12' and 13' of bolts 8' and 9'.

In Fig. 5 there are illustrated clips 29 and 31 of U-shape anchored on the heads 13' and 14' of bolts 9' and 11' to confine the bag 22' of detonating powder.

A cap plate 32 is mounted in the bottom of the fuse body 3 in any suitable manner as by means of threads 33 so as to close the annular chamber 15. Cap 32 is provided with passages 34 therethrough, which passages are closed by a diaphragm 35 of suitable frangible material such as Bakelite which will permit the flame from the detonating powder 23 to emerge from the passages 34 and ignite the main charge 2 of the shell.

In the operation of the device with the parts in the positions illustrated in Fig. 1, discharge of the shell from a rifle causes heavy accelerational and centrifugal forces to be applied to all parts of the shell and its contents. The bag of detonating powder 23 thus has a tendency to slide around in the channel 15 away from its position under the percussion cap 16. Due, however, to any of the various holding means illustrated, the bag is prevented from such motion, and when the firing pin 19 is released by the timing mechanism 5, the explosion of the percussion cap 16 ignites the portion of the detonating powder immediately adjacent thereto whereby the flame from the detonating powder traverses the passages 34 in the cap 32, penetrating the diaphragm 35 and igniting the main charge 2 of the shell.

Although certain embodiments of the invention have been shown and described in detail, it will be understood that other embodiments are possible and that various changes may be made in the construction and arrangement of the parts without departing from the spirit of the invention as defined in the claims appended hereto.

What is claimed is:

1. In an explosive projectile for rifles, a shell body, a mechanical time fuse mounted therein including a percussion cap, a firing pin therefor, a clockwork controlling the release of the firing pin, said fuse having an annular channel, a container of detonating explosive loosely mounted in the channel, and bolts for anchoring the clockwork in the fuse, said bolts having heads projecting into the channel to obstruct the channel and confine the container of detonating explosive from rotary movement therein.

2. In an explosive projectile for rifles, a shell body, a mechanical time fuse mounted therein including a fuse body comprising a cup-shaped receptacle with an annular channel formed in the bottom and apertures through the bottom connecting the interior of the receptacle with the channel, a percussion cap in one of said apertures, a clockwork in the receptacle, bolts traversing other of said apertures, serving to anchor the clockwork to the bottom of the receptacle, and a container of detonating explosive in the channel, said bolts having heads extending into and obstructing the channel to confine the container of detonating explosive therein to a position adjacent the percussion cap.

3. A mechanical time fuse for an explosive projectile subject to high rotational acceleration including a body having a cup-shaped socket, the bottom of which is formed by a flat partition having a circular channel formed therein and openings connecting the channel to the interior of the socket, clockwork mounted in the socket, a percussion cap in one of said openings, a pin for firing said cap, controlled by the clockwork, bolts traversing other of said openings for anchoring the clockwork in the socket, and a bag of explosive in the channel, said bolts having heads extending into and obstructing the channel to form abutments confining the bag of explosive to a position adjacent the percussion cap.

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