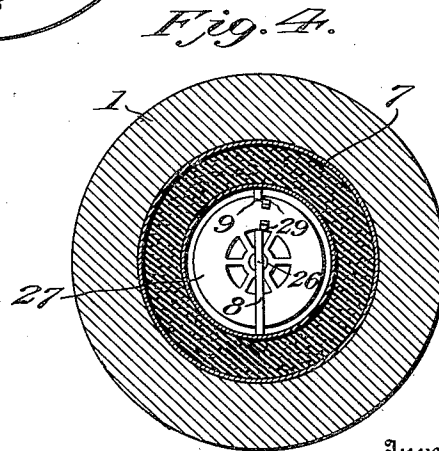
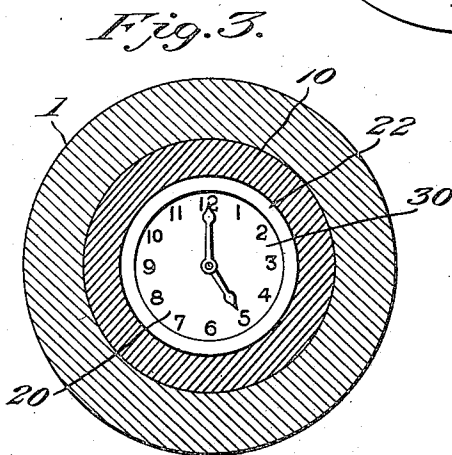
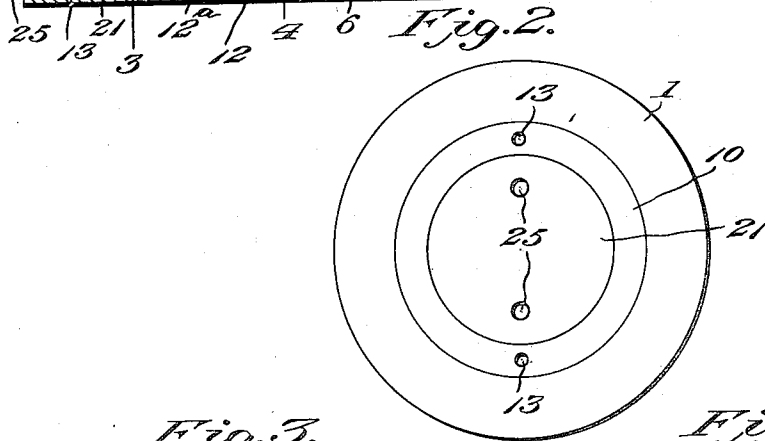
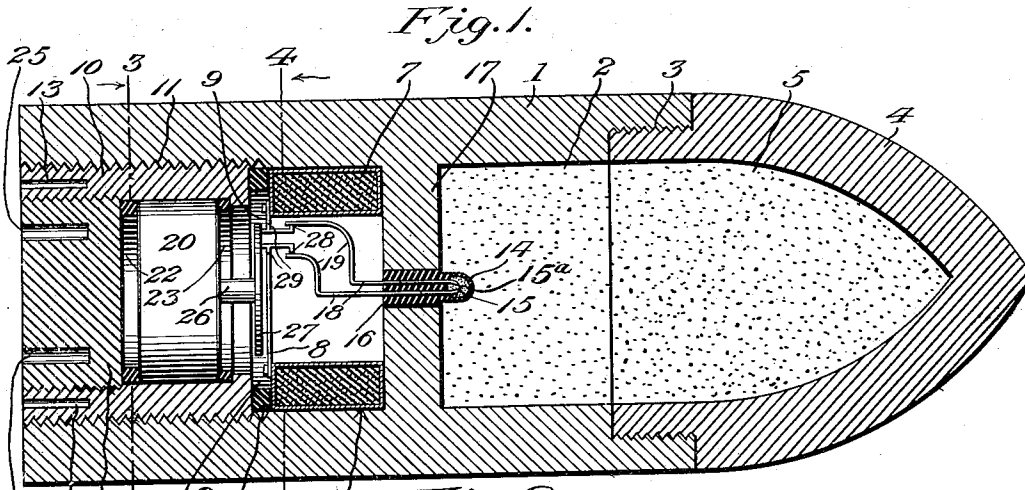


W. M. SMITH.
EXPLOSIVE SHELL.
APPLICATION FILED AUG. 29, 1917.

1,313,129.

Patented Aug. 12, 1919.



Witness

Inventor
William M. Smith

By *[Signature]*
his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM M. SMITH, OF EVANSVILLE, INDIANA.

EXPLOSIVE SHELL.

1,313,129.

Specification of Letters Patent.

Patented Aug. 12, 1919.

Application filed August 29, 1917. Serial No. 188,822.

To all whom it may concern:

Be it known that I, WILLIAM M. SMITH, a citizen of the United States, residing at Evansville, county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Explosive Shells, of which the following is a specification.

This invention relates to those explosive shells which are adapted to be set for explosion under the control of a time-mechanism.

My object is to provide a shell of the character set forth which will be provided with a battery, a time-mechanism, and exploding means, all self-contained therewith by which the shell can be arranged, just prior to firing, so that it will be exploded by the time-mechanism at any future time, according to the desire of the gunner.

My invention is not dependent on a fuse or the like but is solely controlled by a time-mechanism, self-contained therewith, which is only inserted in the shell just prior to firing. Consequently, my shell is to be distinguished from those shells which are exploded by contact, or, by a fuse which burns at a predetermined rate.

In my invention, the gunner determines the exact time the shell is to explode and then introduces and arranges the time-mechanism so that, at the time determined upon, the time-mechanism will close an electric circuit which includes the battery and cause the firing of a cap and thus explode the charge.

The invention is susceptible of modification and, consequently, the embodiment hereinafter described and which is shown in the accompanying drawings, is to be considered as illustrative, rather than restrictive, of the scope of the invention.

In the accompanying drawings:

Figure 1 is a longitudinal section;

Fig. 2 an end view;

Fig. 3 a section on line 3—3, Fig. 1 and

Fig. 4 a section on line 4—4, Fig. 1.

The body 1 of the shell has a chamber 2 to receive the charge. There is screwed into the body at 3, a hollow nose 4 which also contains the charge 5. In the other end of the shell is a chamber 6 in which fits an annular battery 7 whose contact springs are shown at 8 and 9, arranged diametrically thereof. A plug 10, which is screwed into the end of the shell at 11, bears upon a fiber gasket or washer 12 which bears on the battery 7, thereby holding the battery in posi-

tion and providing a space 12^a in which the controlling element of the time-mechanism turns. The plug 10 is provided with spanner holes 13 so that it may be readily screwed into the shell or removed therefrom.

A detonating cap 14 is arranged so that it will explode the charge 5 when said cap is fired. For the purpose of firing the cap there are provided terminals 15 which extend through a fiber bushing 16 located in a hole in the partition 17 which separates the chamber 2 from the chamber 6. A platinum wire 15^a connects the terminals 15. Metal wires or strips 18 are connected to the terminals 15 and are provided with contacts 19 located adjacent the ends of the contact wires or springs 8, 9.

The plug 10 is of annular form. Located inside the plug 10 is a clock or other time-mechanism 20 which is held securely by a plug 21 screwed into the plug 10. Fiber gaskets 22 and 23, of annular form, are interposed between the clock 20 and the plug 21, and between said clock and the shoulder 24 at the rear of the plug 10. The plug 21 has spanner holes 25 so that it may be readily inserted or removed.

Secured to the hour hand arbor 26 of the clock 20, or suitably geared to said arbor, is a fiber disk 27 which carries electric contacts 28 arranged to engage the contacts 19 and also having contact projections 29 arranged to engage the contacts 8, 9 when the said disk 27 is in line with these contacts. The dial 30 of the clock is outermost so that it faces the gunner when the plug 21 is removed.

When the shell is loaded the clock 20 is left out. Just prior to firing the shell, the clock is inserted and held by the plug 21 which is screwed up tight for that purpose. At that time the hour and minute is noted by the gunner who will know the range and how the clock should be set so that the contacts 28, 29 will engage the contacts 19, 8, 9 at the time the shell is to explode. The future time for explosion of the shell can be set from one hour to twenty-four hours or longer, or any period less than an hour. The shell having been fired from the gun, when it strikes the object it will not explode unless the time set by the gunner has elapsed but it will explode at the time the contacts engage. When the contacts engage, the battery will send a spark to the points 15 and through platinum wire 15^a, whereupon the

wire 15^a will become hot and the cap 14 will be fired and the charge 5 will explode.

As my shell will not explode by contact and will penetrate and embed itself, it possesses the greater advantage of exploding at any desired time after penetration. While the shell can be used in guns of small caliber, it is particularly useful in guns of large caliber such as are used on battleships.

It is within the scope of the invention to provide a time-mechanism which is installed when the shell is made and remains in position, instead of being inserted just prior to firing from the gun.

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

1. An explosive time-shell provided with a charge, an electric generator, means deriving its current from the electric generator adapted for exploding the charge, and a self-contained time-mechanism adapted to be applied to the shell just before insertion in the gun, said shell having means adapted to complete the circuit from the generator to the exploding means, said time-mechanism constituting a self-contained, primary, and sole means for controlling the exploding means.

2. An explosive time-shell provided with a charge, an electric generator, means for exploding the charge by current derived from said electric generator, and a self-contained time-mechanism adapted to be applied to the shell by the gunner which has means adapted to cause completion of the circuit from the generator to the exploding means at a predetermined time, said time mechanism constituting a self-contained, primary, and sole means for controlling the exploding means.

3. An explosive time-shell provided with a body having a charge holding chamber in its forward portion, another chamber in its rear portion, said chambers being separated by a partition or wall, a hollow nose attached to the body and provided with a charge holding chamber which constitutes a continuation of the chamber in the body, means for exploding the charge, an electric battery contained in the rear chamber, and a self-contained time-mechanism, insertible at will in the rear chamber, contact devices whose engagement is controlled by the time-mechanism, and electric connections leading to the exploding means, whose circuit is con-

trolled by the time-mechanism, said time mechanism constituting a self-contained, primary, and sole means for controlling the exploding means.

4. An explosive shell provided with a body having a charge holding chamber in its forward portion, another chamber in its rear portion, said chambers being separated by a partition or wall, a hollow nose attached to the body and provided with a charge holding chamber which constitutes a continuation of the chamber in the body, means for exploding the charge, an electric battery contained within the rear chamber, contacts or terminals for said battery, circuit connections leading to the exploding means aforesaid which have contacts arranged in the region of the contacts of the battery, a time-mechanism having contact means adapted to engage all of the contacts aforesaid when said time-mechanism has placed its contacts in a predetermined position, and means for removably holding the time-mechanism in position, whereby it may be applied to the shell after the latter has been charged.

5. An explosive shell having a body provided with a chamber in its forward portion, another chamber in its rearward portion, a partition or web separating said chambers, a hollow nose having a screw-threaded engagement with the body, a charge contained within said nose and the chamber in the forward portion of the body, an annular electric battery contained within the chamber in the rearward portion of the body, a cap for exploding the charge, terminals leading to the cap which extend through the partition and are provided with contacts, terminals for the battery, an annular plug screwed into the rearward portion of the body which holds the battery in position, a removable time-mechanism located within the annular plug and provided with a rotary member having contacts adapted to engage the terminals of the battery and the other contacts when said rotary member is in a predetermined position, and a removable plug screwed into the plug first-named which holds the time-mechanism removably in position and adapts the time-mechanism to be placed in the annular plug after the shell has been loaded.

In testimony whereof I hereunto affix my signature.

WILLIAM M. SMITH.