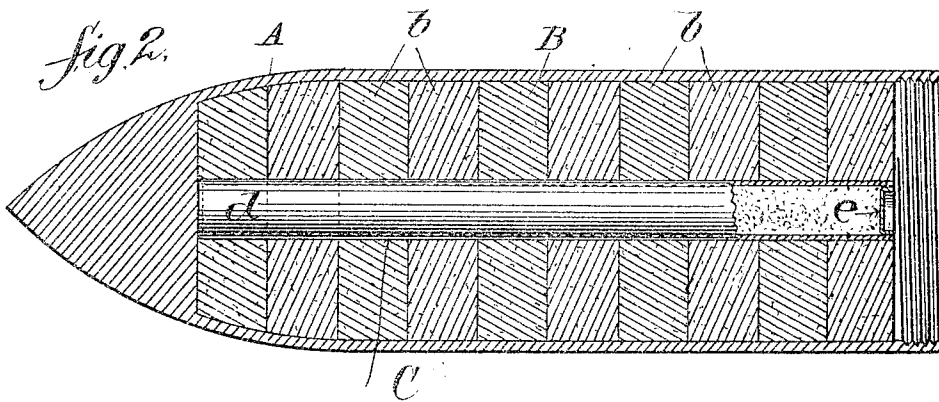
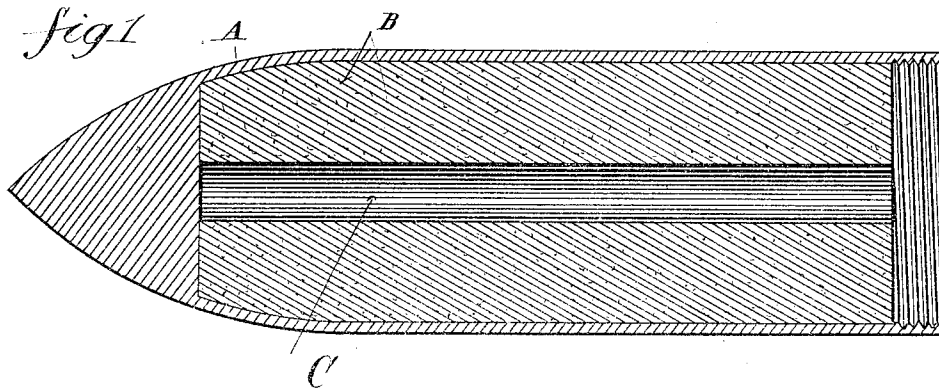


E. JANDRIER & G. S. MERRILL.
CHARGE FOR PROJECTILES.
APPLICATION FILED MAR. 7, 1910.

1,010,430.

Patented Dec. 5, 1911.



Witnesses:
W. M. Benjamin
S. F. Randall

Edmond Jandrier
George Spencer Merrill
Inventors

By their Attorney
Clarkson A. Collins

UNITED STATES PATENT OFFICE.

EDMOND JANDRIER AND GEORGE SPENCER MERRILL, OF PEACE DALE, RHODE ISLAND.

CHARGE FOR PROJECTILES.

1,010,430.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed March 7, 1910. Serial No. 547,735.

To all whom it may concern:

Be it known that we, EDMOND JANDRIER, a citizen of the French Republic, and GEORGE SPENCER MERRILL, a citizen of the United States, both residing at Peace Dale, in the county of Washington and State of Rhode Island, both of whom have their post-office address at Peace Dale, Rhode Island, have invented certain new and useful Improvements in Charges for Projectiles, of which the following is a specification.

Our invention relates to charges for shells and similar projectiles, and the object of our improvements is to provide a high power explosive charge for this purpose which can be safely handled, conveniently inserted in the shell chamber and removed therefrom if desired, combined with a separately insertible and removable detonating charge.

In carrying our invention into effect we take advantage of the fact that certain high power explosives have such a low melting point that they can be melted with little or no danger, to form solid cast charges, or solid units which, when placed together, form a charge, adapted in size and shape to the shell chamber. Thus we may use trinitro cresol, which melts at 107° C., or trinitro toluol, which melts at 80° C., or a mixture of picric acid and trinitro cresol in equal parts, which melts at 70° C., or any other suitable or desired explosive or mixture of explosives which can be melted without danger of explosion, and having melted such an explosive, we run the melted mass into molds of suitable size and shape where it is allowed to slowly cool and harden. We prefer to employ in the manufacture of the solid charges the process set forth in our companion application No. 547,738 filed of even date herewith. Such explosives when melted and hardened are not readily exploded by concussion, by heat (unless confined), or in any manner except by detonation. We accordingly provide for the explosion of the charge by combining therewith a detonating charge consisting of a case or shell of paper or other suitable material filled with any sensitive explosive which can be exploded in the usual manner, such as a granular or crystalline explosive, gun cotton or other explosive which can be exploded by means of a fulminator or other exploding device, and adapted to be inserted

in a central orifice formed in the cast charge in the process of casting.

The invention will be best understood by reference to the accompanying drawing, which illustrates embodiments thereof.

Figure 1 of the drawings shows a sectional view of a shell containing a charge cast to fit the shell in a single piece, but without the detonating charge. Fig. 2 shows a sectional view of a shell containing a charge made up of a number of cast units with the detonating charge in place; and Fig. 3 shows a perspective view of a detonating charge ready for insertion in the explosive charge.

Referring to the drawings, A indicates a shell having the usual charge chamber, and B the explosive charge therein. The charge, B, is formed by melting an explosive of the class indicated above, and pouring the melted mass into molds of such size and shape that the cast product will form a charge adapted to fit the chamber of a projectile of the caliber for which the charge is intended. The charge, B, may, as shown in Fig. 1, be of such size and shape as to form a single, solid charge fitting and filling the shell chamber, or it may, as shown in Fig. 2, be cast in sections or units, *b, b, b*, so shaped and proportioned that a number thereof assembled will make up the aggregate charge. In either case the charge is provided with a central orifice, or bore, C, formed in the process of casting the charge or charge units, and adapted to receive the detonating charge, D. The detonating charge, D, is formed by filling a case or bag, *d*, of paper or other suitable material, preferably waterproof, of such size and shape as to enter and fill the bore, C, with a sensitive explosive, which may be exploded in any usual or convenient manner, and the detonation of which will serve to explode the charge, B.

The open end of the case, or bag, *d*, through which the charge is inserted, is closed in any convenient manner after the filling is completed, to prevent the sifting out of any portion of the charge, as by being sealed with an end piece, *e*, or simply tied with a string as indicated at *e'*.

In charging the shell the cast exploding charge, B, is first placed in the shell chamber. The detonating charge, D, is then (or if desired before inserting the charge B in

the shell) inserted in the bore, C, and if required, opened at the rear to permit the insertion therein of the discharging device, and the breech of the shell is then inserted. In exploding the shell the detonating charge, D, is exploded in the same manner as detonating charges have heretofore been exploded, and any usual or convenient form of exploding device can be employed. In case after a shell has been charged it is desired to draw the charge, this can be safely done by first withdrawing from the bore, C, the case, *d*, containing the detonating charge, after which the exploding charge, B, can be withdrawn by means of a hook or other engaging device inserted in the bore, C.

By means of our invention explosive charges for shells may be safely stored in quantity and kept in readiness for use, and shells can be safely and quickly charged therewith, if desired, immediately before being used, and can be safely uncharged if required. Shells may also be loaded with their exploding charges, but without the detonating charges, and stored in quantity and kept for any length of time in safety and without deterioration, the detonating charges being added immediately before

firing. The advantages of these features will be readily appreciated by those skilled in the art.

What we claim as new and desire to secure by Letters Patent is:

1. An explosive charge consisting of a main charge of explosive material in the form of a cast homogeneous solid, having a cavity formed therein to receive a detonating charge, a detonating charge casing fitting said cavity removable, and completely inclosing its contents and a detonating charge contained within said casing.

2. An explosive charge consisting of a main charge of explosive material in the form of a homogeneous solid provided with a cavity to receive a detonating charge, a detonating charge casing fitting said cavity and removably held therein, said casing being constructed to completely inclose its contents, and a detonating charge in said casing.

In testimony whereof, we have hereunto subscribed our names this 4th day of March A. D. 1910.

EDMOND JANDRIER.

GEORGE SPENCER MERRILL.

Witnesses:

JOHN ROBINSON CARPENTER,

DEXTER WILBUR HOXIE.