(No Model.)

A. W. VON SCHMIDT.

SHELL FOR HIGH EXPLOSIVES.

No. 422,636. Patented Mar. 4, 1890.

Fig. 1.

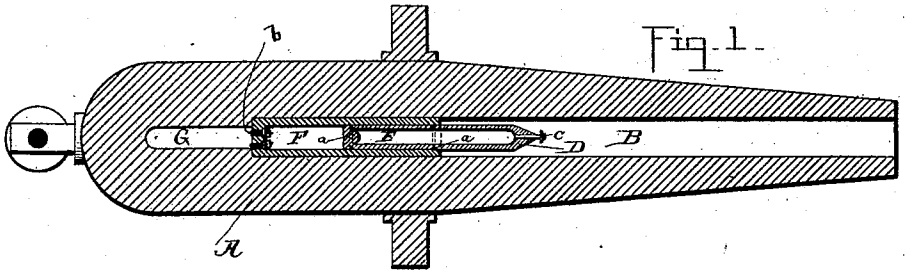


Fig. 2.

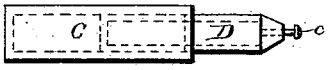


Fig. 3.

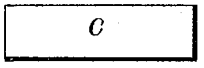


Fig. 4.



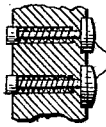


Fig. 5.

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UNITED STATES PATENT OFFICE.

ALLEXEY W. VON SCHMIDT, OF SAN FRANCISCO, CALIFORNIA.

SHELL FOR HIGH EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 422,636, dated March 4, 1890.

Application filed August 26, 1889. Serial No. 322,040½. (No model.)

To all whom it may concern:

Be it known that I, ALLEXEY W. VON SCHMIDT, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in the Construction and Discharge of Dynamite-Shells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in the construction of projectiles loaded with dynamite or high explosives to prevent premature explosion of the projectile while in the act of firing from the concussion or shock of the explosion of the charge of powder.

The difficulty heretofore experienced in the discharge of projectiles charged with dynamite or high explosives from all kinds of guns by means of ordinary powder has been attended with great danger.

The object of my invention is to prevent the shock on the shell or projectile carrying the dynamite or high explosive.

The invention consists of a metal tube or casing with a bottom at one end next the powder and the shell or projectile fitting into said tube or casing in an air-tight manner, leaving a space between the lower end of the projectile and the bottom of the tube or casing, so as to form an air-cushion, which breaks the shock on the dynamite-loaded projectile when the gun is fired, and at the same time admits at the moment of the explosion of the powder charge a certain amount of gas to the casing to assist the air therein contained in cushioning the projectile, the mechanical construction of the rear or closed end of this casing being such as to not only permit the entrance of gas, as stated, but also to permit the entrance of air when the projectile begins to move away from the casing, thus allowing a quick and ready separation of the projectile from the casing soon after they have left the gun.

In order that those skilled in the art may know how to make and use my improved method of constructing the said dynamite shell or projectile, I will now proceed to minutely describe the same in connection with the accompanying drawings, in which—

Figure 1 is a plan longitudinal view, partly in section, of a cannon with the casing and shell or projectile in place, with powder-chamber all in position. Fig. 2 represents casing and projectile. Fig. 3 represents casing. Fig. 4 represents projectile. Fig. 5 is a detail view, enlarged scale, of the rear end of casing with air-valves arranged therein.

Like letters represent like parts in the several figures.

A represents a longitudinal view of cannon.

B represents the bore of cannon.

C represents the casing or tube, composed of suitable metal and having one end closed or headed, as clearly shown.

D represents the dynamite-loaded projectile, E the chamber for the high explosive, and F the air-chamber formed between the projectile and the head or closed end of tube C for the projectile D to cushion upon.

G represents an ordinary powder-chamber in the cannon.

a represents hemp or other suitable packing to produce a close or air-tight joint between the projectile and the walls of the tube C.

b represents air-valves in head of tube C or casing immediately in front of the powder-chamber.

c represents the head of rod or pin for firing projectile on striking.

The casing or tube is made of any desirable metal and any thickness or length. The inside of this case is turned to a true and exact size, and the outside of said case is also turned to a true size for the gun or cannon in which it is to be used. One end of case C is left open, while the other end, as before stated, has a head sufficiently strong to resist the charge in the cannon.

D represents the dynamite shell or projectile. This projectile is hollow and made of any length and size as well as thickness of metal. The outside of this projectile is also turned true and is made to fit with great exactness in the casing or tube C, and is provided with small grooves, turned as shown at *a'* in Figs. 1 and 4, into which grooves, hemp or other suitable packing is placed to

more effectually make the projectile fit as near air-tight in the casing as possible.

b represents any suitable number of air-valves at head of casing, which are so arranged with suitable coiled or other springs that under ordinary circumstances they are held in a closed position upon their seats, but which shall at the moment of the discharge of the powder open forwardly, and thus permit part of the gases generated by the explosion to enter the air-space F, and thus assist the contained air in forming a cushion for the shell or projectile D, and when the projectile has left the gun it has a tendency to fly away from the casing, and would, if not otherwise provided for, produce a vacuum or partial vacuum in the casing, which would retard or entirely prevent the separation of the projectile from the casing; but this difficulty is provided against by the valves *b*, which open inwardly to admit air to the interior of the casing, and thus the projectile is allowed to free itself from the same, the casing dropping, while the projectile continues in its flight.

To use this method of firing dynamite-projectiles out of ordinary guns, cannons, or mortars, the gun is loaded with the ordinary powder long in use for such purposes, and the casing, which is well tallowed on the inside, has placed within it the projectile D, which is so located as that only about one-half of its length projects beyond the casing, in which position it is secured by a small wire or cord, if necessary. The tube or casing and the loaded projectile may then be loaded into the gun and pushed gently home to the cartridge in the gun, and the piece is then ready to be discharged. On firing or exploding the charge of powder the casing first starts, the air contained within the space F forming a cushion on the projectile without causing a blow. The projectile then starts on its course, and when out of the gun the casing and projectile become detached and the latter goes on to its destination, where it is exploded in the usual manner of exploding dynamite-shells.

It will be understood that when the casing starts to move as the result of the explosive force of the powder, the dynamite-shell momentarily remaining stationary, the air within the casing and behind the shell is necessarily compressed by being confined within a limited space, and that the expansive force of the air is supplemented by the entrance through the valves of a certain portion of the gases, and that when the shell and the casing, both moving together, emerge from the muzzle of the gun, the valves being closed, the expansive force of the contained air operates to start the shell out of the casing. This movement of the shell, supplemented by the friction of the air against the casing, causes the shell to separate from the casing. The valves opening inwardly prevent the creation of a vacuum.

Having thus described my invention, what I claim is—

1. A dynamite projectile or shell for use in ordinary guns, composed of a dynamite-receiver D and a close-fitting tube or casing C, having its rear end closed or headed up and provided with air-valves *b*, the dynamite-receiver D and casing C being so arranged relatively to each other as to form an air-space F, as and for the purpose set forth.

2. A dynamite shell or projectile for use in ordinary guns, composed of a dynamite casing or receiver D, a close-fitting tube C, having its rear end closed or headed up and provided with air-valves *b*, and a packing *a*, interposed between the dynamite-shell and the tube C, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALLEXEY W. VON SCHMIDT.

Witnesses:

H. J. LANG,

GEO. T. KNOX.