(No Model.) 2 Sheets—Sheet 1.

B. B. HOTCHKISS.

SHELL.

No. 266,694. Patented Oct. 31, 1882.

Fig. 1.

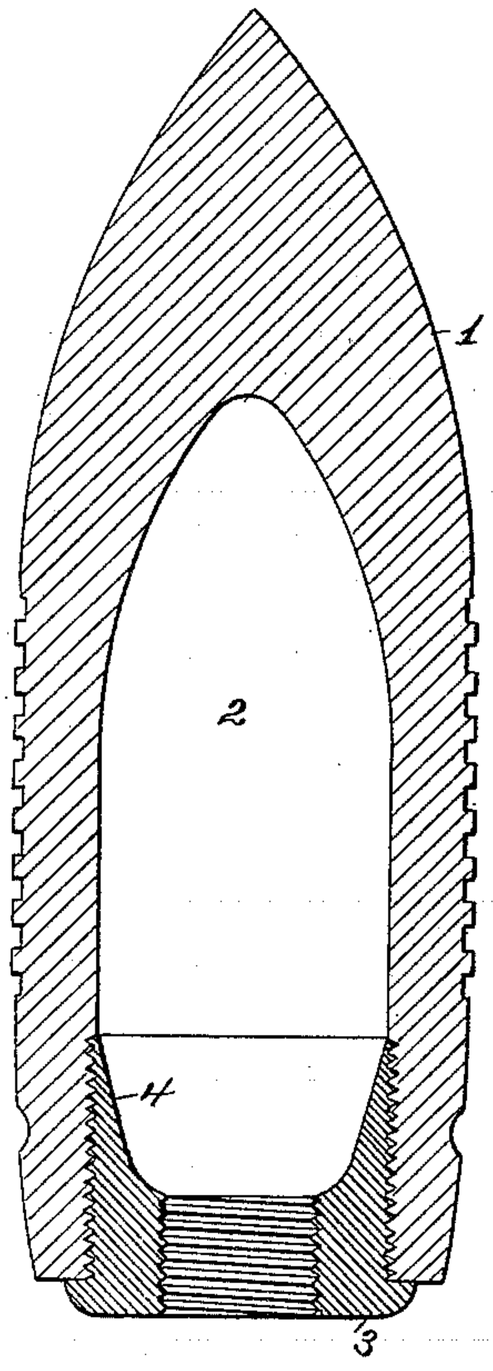
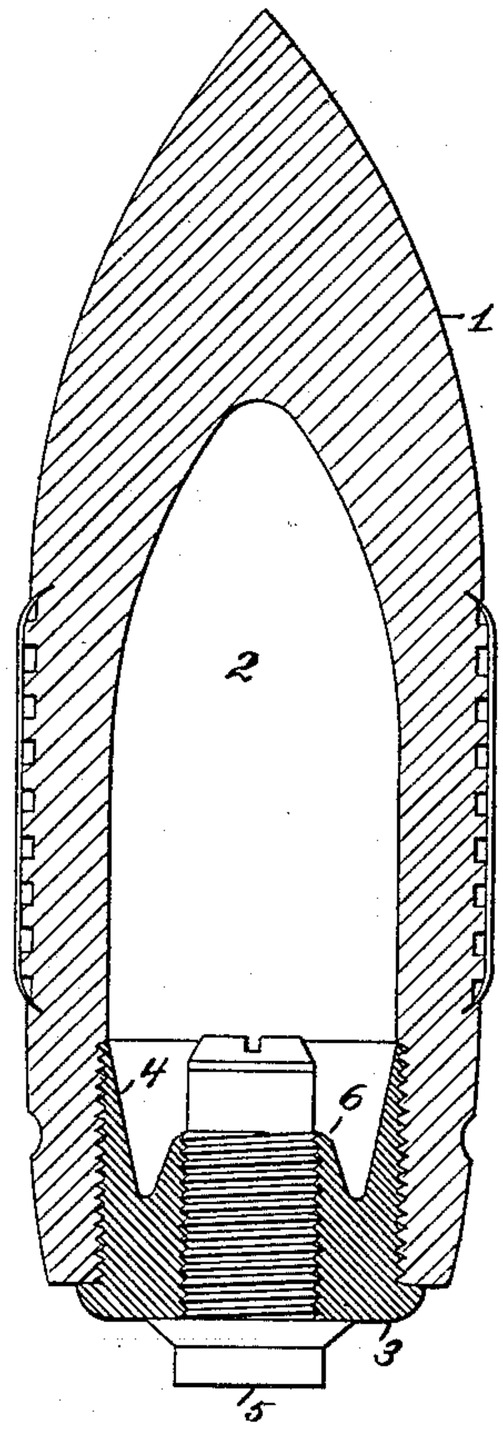


Fig. 2.



Attest;
Geo. H. Graham
Alex. Scott

Inventor;
Benj. B. Hotchkiss,
by Munson & Philipp
Attys

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

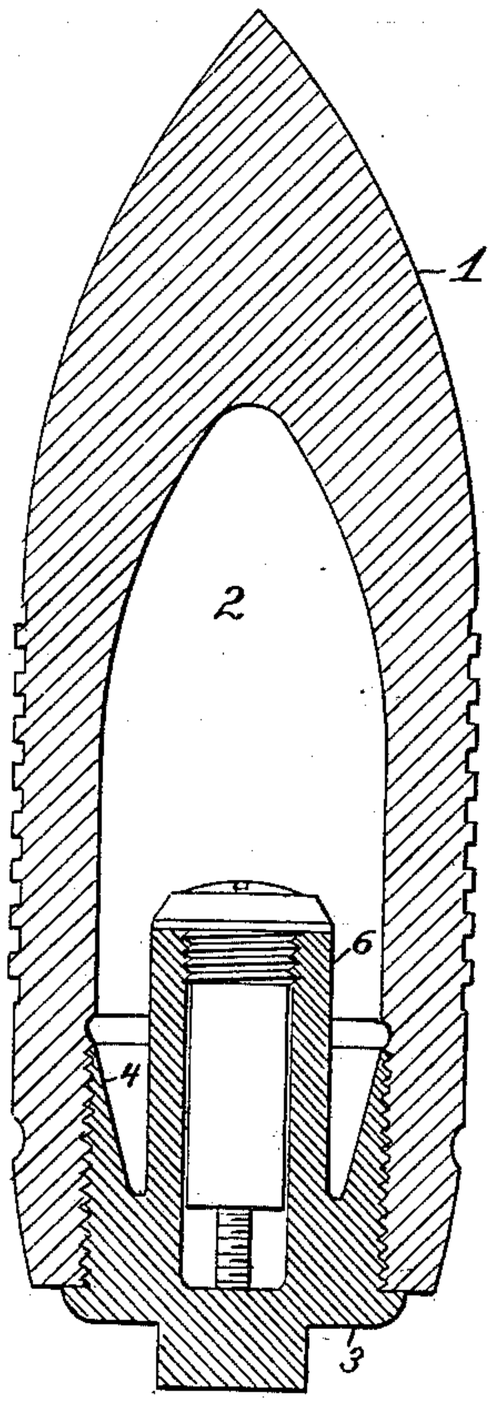
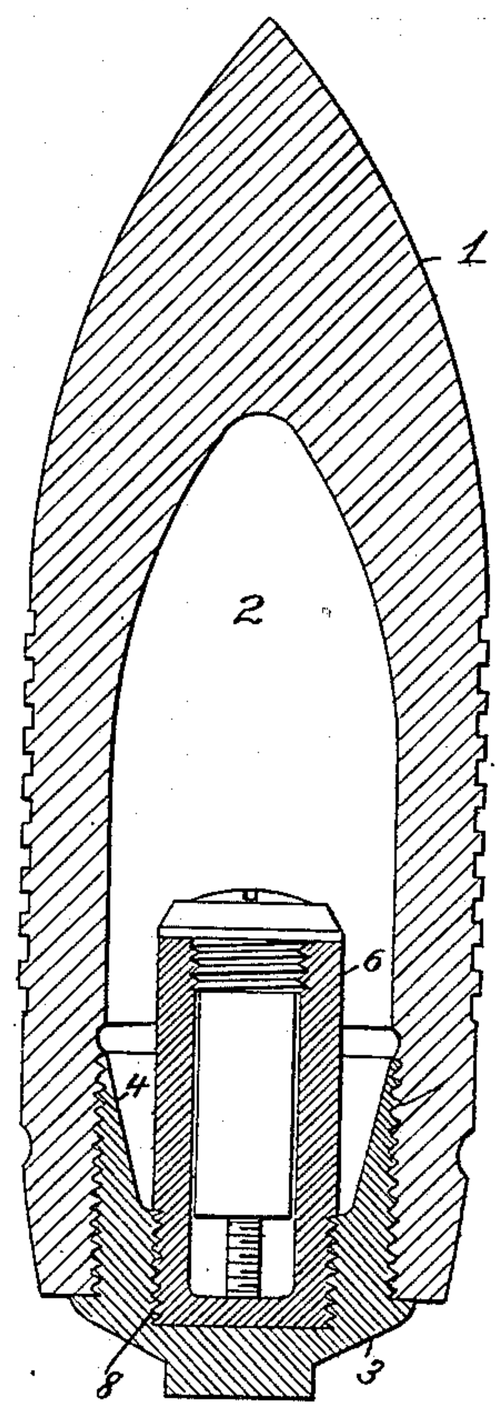


Fig. 4



Attest,

Geo. H. Graham

Alex. Scott

Inventor,

Benj. B. Hotchkiss,

by Munson & Philipp

Att'ys

UNITED STATES PATENT OFFICE.

BENJAMIN B. HOTCHKISS, OF NEW YORK, N. Y.

SHELL.

SPECIFICATION forming part of Letters Patent No. 266,694, dated October 31, 1882.

Application filed March 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN B. HOTCHKISS, a citizen of the United States, residing in the city of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Projectiles, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to punching or piercing shells, or that class of hollow explosive projectiles which are provided with a butt-fuse for igniting the charge. In constructing such shells when made from steel or similar hard metal it has heretofore been common to bore out the interior so as to form a cavity having two differing diameters, the inner portion or chamber, designed to receive the charge for exploding the shell, being made as large as the shell practically admits of, while the outer portion, at the rear of the shell, is made of greatly reduced size, or that sufficient to receive the fuse. The cavity is formed in this manner in order to reduce as far as possible the surface area of the plug used for closing the same, so that the liability of its being blown out by the explosion of the charge before the shell bursts is reduced to its minimum, which blowing out, should it take place, would allow the escape of gases to such an extent as to reduce their pressure, and thus prevent the bursting of the shell, or at least greatly reduce the destructive effects of its bursting. As will be readily understood, considerable difficulty is experienced in boring a cavity with such varying diameters in a solid shot made of steel or similar hard metal, while the process is necessarily slow and expensive, and it is the object of these improvements to avoid this difficult operation and construction, to lessen the expense attending the production of this class of projectiles, and at the same time to overcome the liability of displacing the fuse during the bursting of the shell.

To these ends the invention consists in a shell having a chamber of about uniform large bore, or one not contracted rearward, and provided with a closing-plug or fuse-receiver so constructed that the pressure of the gases at the time of the explosion shall act laterally upon the receiver, thereby insuring its resistance to displacement, and whereby a receiver of a size equal to the large bore of the shell can be used without danger of being blown out of position before the bursting of the shell.

The invention also includes the combination, with such a shell and receiver, of a suitable fuse.

In the drawings illustrating practical embodiments of the invention, Figure 1 represents a longitudinal section of a hollow explosive projectile or shell provided with a fuse-receiver of improved construction. Fig. 2 is a like view showing a fuse-receiver embodying my improvement, and also showing the fuse in position. Fig. 3 is a like view showing a fuse-receiver embodying the invention and having a modified form of fuse-seat; and Fig. 4 is a like view showing a fuse-receiver still further modified in the structure of its seat.

The shell 1 may be made of steel or other suitable metal, and in some instances may be cast into hollow form in lieu of boring or fitting. It is of the ordinary construction, except that the cavity 2, which is to contain the bursting-charge, instead of being formed with two varying diameters, as hereinbefore explained, has its largest diameter continued rearward to the base of the shell. This makes the opening through the rear of the shell as large in size as any part of the cavity, and hence, when it is formed by boring out the solid metal, that operation is greatly facilitated and the cost of production materially lessened. This enlarged opening will of course present an area transversely equal to that of the charge-chamber, which must be closed by a fuse-receiver having a construction capacitating it to resist the pressure exerted upon it at the time of the explosion of the charge within the shell. To accomplish this the opening through the rear or butt of the shell is closed by a fuse-receiver, 3, in the form of a screw-plug, which is recessed to provide inwardly-extending walls, inclined or tapered so as to form a comparatively thin annular projection, 4, against which the gases will impinge with lateral pressure. From this construction of the fuse-receiver 3 it results that the force of the explosion, which tends to drive the receiver from its seat, is at the same time exerted laterally against the thin projection, and thus forces and holds it with such power against the threaded walls of the shell

as not only to prevent the starting of the receiver, but to most securely hold it rigidly in place. In its simplest form this fuse-receiver will have its outer wall extended to form one thin projection, 4, it being understood that when the small threaded opening through it, which forms a seat for a fuse, is filled by a fuse, the lateral pressure of the gases will operate to secure said fuse-receiver in place, as explained, and also that as the force which tends to drive the fuse-receiver 3 rearward increases the force exerted against its thin projection 4, tending to hold the receiver in place, will be proportionately increased, while the exposed surface of the fuse will be relatively so small as to prevent its displacement.

In Figs. 1 and 2 the fuse-receiver 3 is shown as provided with a tapped hole, that forms the seat to receive the fuse 5, which in these cases may be inserted from the rear, either before or after the receiver is screwed into the shell.

In order to reduce the liability of the fuse from being displaced by the explosion of the charge in the shell, it is shown in Fig. 2 as surrounded by a housing consisting of a second thin annular projection, 6, extending inwardly from the receiver, upon which the gases act in the same manner as that already explained in connection with projection 4, its purpose being to enable the gas-pressure to more securely hold the fuse 5 in place, instead of tending to displace it.

In Figs. 3 and 4 the receiver is shown as solid and provided interiorly with the fuse-seat. As shown, the annular projection 6 is made to extend inwardly to a much greater extent than it does in Fig. 2, and this fuse-holding projection or seat is also utilized to take the place of the outer case of the fuse. In Figs. 2 and 3 this projection is furthermore made integral with the fuse-receiver 3, while in the structure of Fig. 4 it is made separate and screwed into the fuse-receiver. In the constructions Figs. 3 and 4 the fuse must of course be placed in position before the receiver is inserted into the shell.

While the structures shown in Figs. 3 and 4 embody the present improvements, they are only embraced herein as broadly claimed.

The following is claimed as new:

1. In a hollow explosive projectile or shell, a base closure consisting of a fuse-receiver having a fuse-seat and an inwardly-extending comparatively thin annular projection, as 4, that forms a rearward continuation of the charge-chamber, substantially as described.

2. In a hollow explosive projectile or shell, a base closure consisting of a fuse-receiver having two inwardly-extending annular projections, one forming a fuse-housing and the other a rearward continuation of the walls of the charge-chamber, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:
ROBT. M. HOOPER,
DAVID T. S. FULLER.