

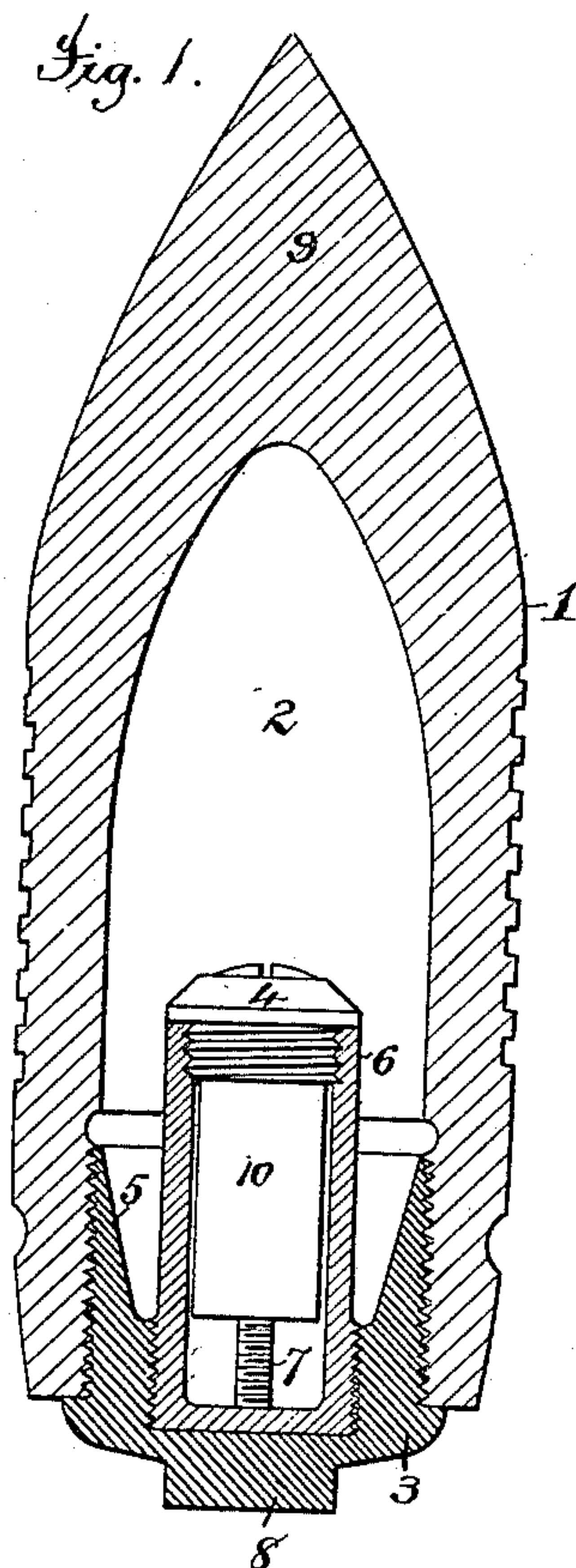
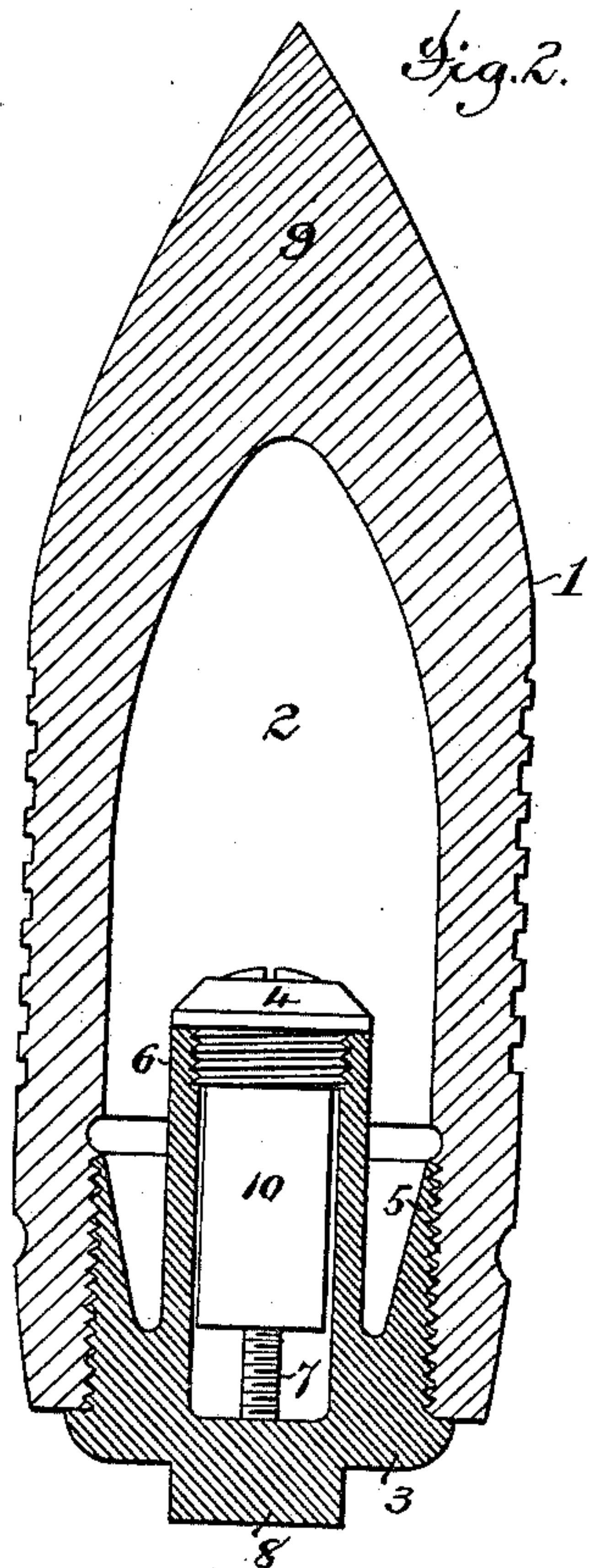
(No Model.)

B. B. HOTCHKISS.

SHELL.

No. 272,052.

Patented Feb. 13, 1883.



Attest;
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UNITED STATES PATENT OFFICE.

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

SHELL.

SPECIFICATION forming part of Letters Patent No. 272,052, dated February 13, 1883.

Application filed September 1, 1882. (No model.) Patented in England December 9, 1881.

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, (temporarily domiciled in Paris, France,) 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 explosive projectiles which, constructed of steel or similar hard metal and provided with butt-fuses, are especially adapted to penetrate the object intended to be destroyed.

In order to effect the cheap production of shells of this character when made, as is most desirable, from metal having the characteristics of steel, the charge-chamber is formed in the simplest manner by a boring-tool that makes a recess having a uniform diameter rearward. While this operation is a rapid and comparatively inexpensive mode of providing the shell with a charge-chamber that provides suitably weak walls, it necessarily makes an opening through the butt of the shell which has a transverse area equal to that of the charge-chamber, and hence one that must be closed by a plug having the capacity to so resist the strains exerted by gases, resulting from the ignited charge of powder, as to cause the same to burst the shell before or simultaneously with the displacement of said closing-plug. This convenient and cheap structure of shell and mode of forming its powder-chamber has been utilized by me through improvements forming the subject-matter of another patent, said improvements embodying a butt-closure constituting a fuse-receiver having an internally-extending comparatively thin annular projection that forms a continuation of the charge-chamber, which is thus adapted to be so acted upon by the gases that the pressure exerted thereby at the time of explosion shall act laterally upon the annular projection and cause it to be pressed or held against the threaded wall of the shell with a power greater than that operating to force the closure rearward.

The present improvements relate to a shell of that construction, and consist in a solid

closure having the aforesaid inwardly-extending side wall or thin annular projection, and provided internally with a fuse-housing, as will be more particularly hereinafter pointed out.

In the accompanying drawings, two embodiments of the invention are shown by longitudinal sectional elevations, Figure 1 exhibiting the fuse-housing made in a piece separate from the fuse-receiver, while Fig. 2 shows the fuse-housing as integral with the receiver.

In the present state of the science of military warfare, shells of the class known as "punching" or "piercing" shells are most generally employed, and such shells must be made of very hard metal—as steel—in order to penetrate the protective armor employed to resist destruction, especially in torpedo-boats or armored ships; and hence to meet this requirement, as well as to produce such shells at a minimum cost, the mode of forming the powder-chamber by a uniform bore in the solid metal, heretofore described, can be most advantageously employed; and in order to effectually close the butt-opening thus made and properly support a fuse, a closure or fuse-receiver having the capacity to resist rearward displacement at the explosion of the shell is required. It is, however, desirable that this fuse-receiver shall be constructed so as to fully protect the fuse it supports during handling or transportation, which is accomplished by the solid closure or fuse-receiver and the fuse-housing with which it is provided, and which will now be explained.

The shell 1 consists of metal, preferably steel, and is provided with a powder or charge chamber, 2, that has a uniform diameter, produced by the action of a boring-tool, (but which in some cases may be accomplished by casting,) which chamber provides a point or nose, 9, composed of a sufficient body of metal to impart a suitable penetrating strength and leave side walls weak enough to be ruptured by the exploding charge. The large opening thus made through the butt is filled by a closure or fuse-receiver, 3, that is formed from a solid piece of metal, either by casting or turning, which receiver has a threaded exterior, fitting within the threaded wall of the chamber. It is also provided with an inward projection or

annular wall, 5, that is tapered so as to be comparatively thin, and hence be adapted to be quickly acted upon by the pressure of the gases and forcibly held to its screw-threaded seat, thus resisting the tendency of rearward displacement, the structure in effect furnishing a greater surface area exposed to lateral pressure than is presented to longitudinal pressure, whereby the holding power in the one direction is greater than is the displacing power exerted in the other direction. This receiver 3 is further provided with an inwardly-extending wall, that forms a tubular housing, 6, for the internal parts of a fuse. This housing is preferably made an independent structure, as shown in Fig. 1, where it is shown as secured in a screw-threaded seat formed in the inner face of the receiver, which enables the fuse to be more conveniently constructed and made of a metal differing from that of the receiver 3. The said housing may, however, be made integral with the receiver 3, as is shown in Fig. 2.

Any construction of fuse may be used within the housing 6; but for the purpose of this description one of the structures shown in Letters Patent No. 244,899 is in part shown, a sufficient understanding of which may be had by referring to the following parts, viz: the plunger-body 10, its firing-pin 7, and its closing screw-cap 4, which is entered into the fuse case or housing. The receiver 3, having been provided with its fuse, is screwed into the butt-end of the shell by any means—such as a

wrench fitting onto the projecting polygonal head 8. 35

What is claimed is—

1. In a hollow explosive projectile or shell, a solid butt-closure having a peripheral inwardly-extending annular wall that forms a comparatively thin rearward continuation of the powder-chamber and a central inwardly-extending wall that forms a tubular fuse case or housing, substantially as described. 40

2. In a hollow explosive projectile or shell, the combination, with a solid butt-closure having an inwardly-extending annular wall that forms a comparatively thin rearward continuation of the powder-chamber and is provided internally with a seat therefor, of a detachable tubular fuse case or housing, substantially as described. 45 50

3. A hollow explosive projectile or shell consisting of a solid butt-closure having a peripheral inwardly-extending annular wall that forms a comparatively thin rearward continuation of the powder-chamber, a central inwardly-extending wall that forms a tubular case or housing for a fuse, and a fuse, substantially as described. 55 60

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

B. B. HOTCHKISS.

Witnesses:

T. H. PALMER,
GEO. H. GRAHAM.