

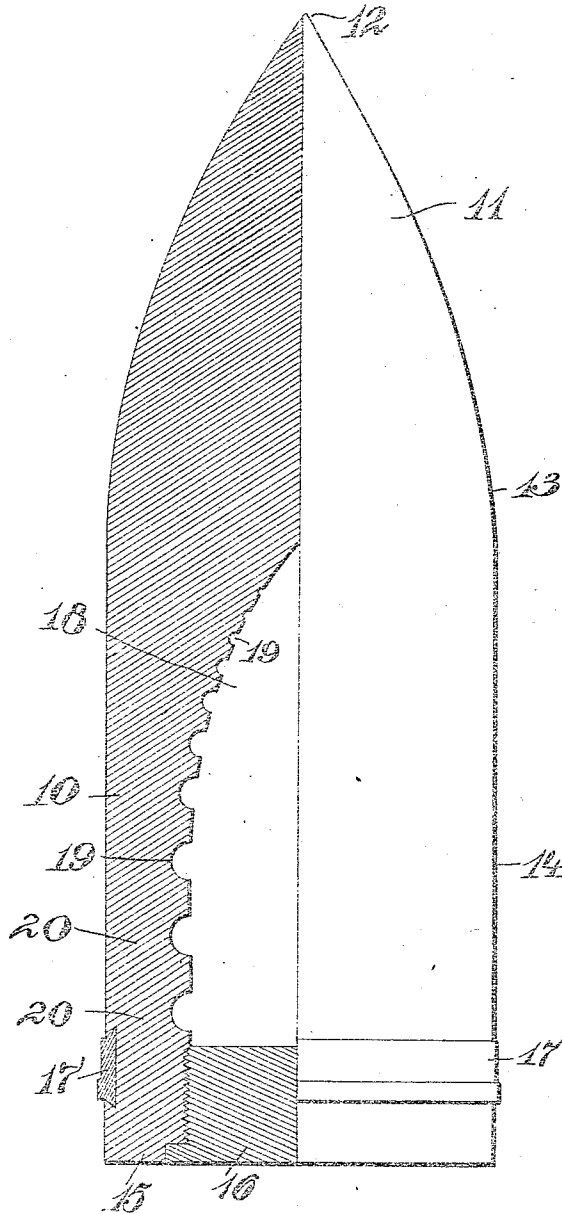
A. J. SODEN.

SHELL.

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1,023,339.

Patented Apr. 16, 1912



WITNESSES:

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SHELL.

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To all whom it may concern.

Be it known that I, ALFRED J. SODEN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in 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, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved shell and is designed to provide an armor-piercing projectile provided with an explosive chamber, the walls between the outside surface and the explosive chamber being of a formation to provide for the stability of the projectile making the shell less liable to compress on the impact, and at the same time to provide points of fracture so that pressure from the inside causes a shattering of the shell.

The invention is illustrated in the accompanying drawing, in which the single figure shown therein is half section and half elevation of an armor-piercing projectile made according to my invention.

The projectile consists of a body portion 10 which has a pointed front end 11, the point 12 of which is adapted to strike the armor or structure hit by the shell first. The bourrelet 13 is placed at the point of the shell where desired, and the outside 14 of the remainder of the shell terminates in the back of the shell 15, which back is provided with a base-plug 16, which base-plug is shown in the illustration as being solid, although any of the usual types of base-plugs can be used. The rotating band 17 in the band score can be of the usual type, and I do not claim any invention in this portion of the device.

Within the shell and extending from the back toward the front is a recess forming a chamber 18, the walls of the chamber being provided with grooves 19. The grooves can be made of various depths and spaced apart various distances, or they may be of different depths. The grooves being placed on the inner walls of the chamber give a conformation and a distribution of material between the chamber and the outer surface of

the shell that provides for great resistance against pressure from the outside, that is, makes the shell resist compression because the grooves, especially the curved type of groove, give a trussed form to the walls of the chamber and thus make the shell less liable to compression on impact. At the same time these grooves give a comparatively thin strip of material between their innermost point and the outside surface of the shell, and these thinned parts, as at 20, provide points of fracture where the shell will separate and be easily shattered when the charge in the chamber is exploded. The grooves 19 also provide means for preventing the movement of the charge within the chamber by engaging or being engaged by the charge and preventing longitudinal movement thereof. This is particularly true when the chamber is filled with a liquid explosive which solidifies after it is in place, and by running into the grooves 19 and hardening therein, the charge is in fixed position and is not liable to any movement.

In the illustration I show the preferred form of shell in which the grooves 19 become smaller toward the front of the shell, that is, smaller toward the front part of the chamber 18 which is made narrower so as to thicken the walls of the shell. This type is preferred because the strain at the moment of penetration is greatest from the point to the bourrelet, and the shell being solid at these points, the shell is more apt to remain intact and penetrate more directly through the armor or other structure it hits.

The compression to which the projectile is subjected toward the rear thereof after the point and the bourrelet have penetrated, is resisted by the trussed form of wall shown in cross-section in the drawing, which trussed form however does not resist the internal pressure caused by the explosion of the charge.

The proportions of the parts are not always as shown in the drawing, but I prefer to make the shell with the recess narrower toward its front end, the front of the recess being about even with the bourrelet so as to provide the solid pointed front as above described. The grooves 19 can be of any form and can be either made in the shape of annular grooves or formed around the walls in the form of a helix. The approximately transverse disposition of the grooves, how-

ever, is considered essential to give the best results and to provide a more economical and convenient structure to manufacture.

Having thus described my invention, what I claim is:—

1. A projectile having an explosive chamber, the explosive chamber having a series of substantially transversely arranged grooves therein, the grooves becoming shallower toward the front of the projectile.
2. A projectile having a pointed end and being provided with an explosive chamber therein, the explosive chamber itself being narrower toward its front end and being provided with substantially transversely arranged grooves, the grooves becoming shallower toward the narrower or front portion of the explosive chamber.

3. A projectile having an explosive chamber therein, the explosive chamber being provided with a series of annular grooves, which grooves are substantially transversely arranged, the grooves becoming shallower and farther apart toward the front of the chamber.

In testimony, that I claim the foregoing, I have hereunto set my hand this 4th day of May 1911.

ALFRED J. SODEN.

Witnesses:

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