C. HELDT.

SHELL FOR ORDNANCE.

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911,008. Patented Jan. 26, 1909.

Fig. 1.

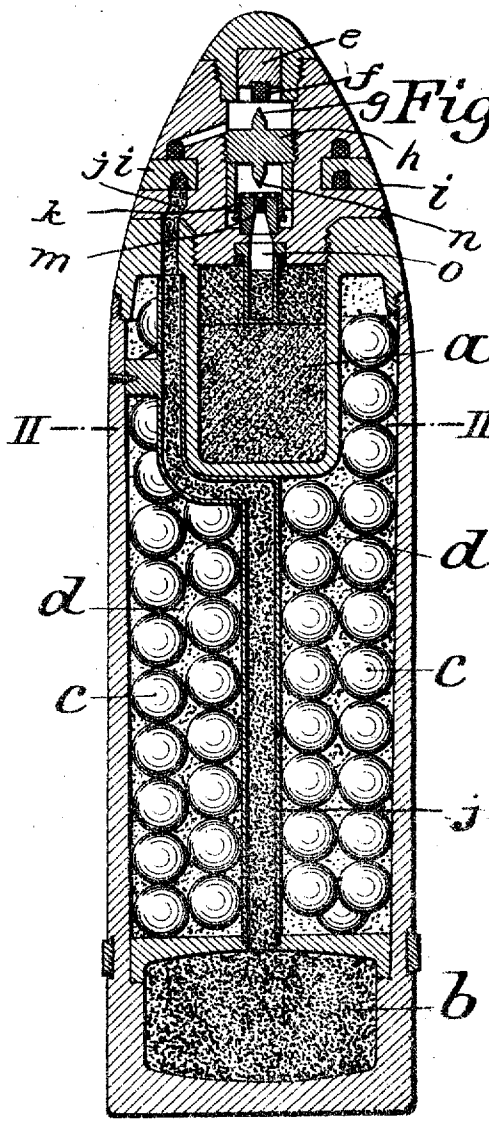
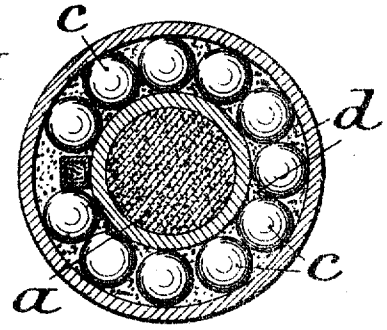


Fig. 2.



WITNESSES

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SHELL FOR ORDNANCE.

No. 911,008. Specification of Letters Patent. Patented Jan. 26, 1909.

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To all whom it may concern:

Be it known that I, CARL HELDT, captain in the army, a subject of the German Emperor, residing at 26 Kapellstrasse, Dusseldorf, Germany, have invented certain new and useful Improvements in Shells for Ordnance; 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.

The present invention relates to a so-called combination shell, *i. e.* a shell which can be used not only as shrapnel but also, by using a high explosive, as a grenade, or it may be used simultaneously as both. This kind of shell has a charge of a high explosive, often placed in a separate part of the shell, such as in the head, or even in the rear part, and this charge produces the effect of a grenade when it is detonated. Such shells also have a shrapnel charge and a filling of shrapnel balls or the like, the said charge consisting of an explosive not belonging to the class of high explosives. This charge is exploded when the shell acts as shrapnel, that is when it is to scatter the filling at a certain point in its path of flight. In this form of the combination the balls or other equivalent pieces constituting the filling, are embedded in a matrix consisting of a mass intended to increase the development of smoke but without effect on the filling.

The present invention relates to an improvement in shells of this kind whereby in the first place an essential increase of the grenade effect is obtained as compared with previous constructions. At the same time it is immaterial what special arrangement the shrapnel filling has in relation to the part acting as a grenade. For the purpose of obtaining the aforesaid increased grenade effect, the balls constituting the filling are not as hitherto packed in a matrix consisting of a material as indifferent as possible in respect of explosive power, such as colophony, sulfur, or a mixture of such substances, but in a high explosive. When in such a shell the high explosive grenade charge is detonated by the known device when the shell strikes its target, the shock simultaneously detonates the explosive which contains the shrapnel filling, so that the effect of the shell as a grenade is considerably increased. If the shell so constructed is to be used as shrapnel, the fuse explodes the charge of propulsive powder or shrapnel charge and the shrapnel balls or the like are projected from the shell or break up the latter and are scattered, no difference being produced as regards the path of flight or other effect of the balls as compared with the case in which the balls are packed in a matrix incapable of detonation. The explosion of the shrapnel powder ignites the high explosive matrix surrounding the balls, and this explosive burns but does not detonate. The slow combustion of the high explosive matrix produces sufficient smoke to enable the shot to be watched, and on this account explosives which produce a large amount of smoke when slowly burned are specially suitable as a matrix for the balls. Lately, such a material has become known under the name of trinitrotoluol. Since the matrix, under these circumstances, does not detonate and its slow combustion does not affect the path of the balls, its presence is harmless.

The accompanying drawing is an example of the present invention, showing a combination shell having the high explosive necessary for the grenade effect in the fore part of the shell. This grenade charge is marked *a*. The shrapnel charge *b* consisting of a propulsive powder such as black powder is in the rear part of the shell. The filling consists of spherical balls or shot *c* and is arranged in the middle part of the shell. Between the shot *c* are spaces which according to the present invention are filled with a high explosive *d* as a matrix.

The fuses employed may be of any ordinary kind. For an example, I have illustrated a time fuse comprising a hammer *e* carrying a primer *f* seated in the head of the shell and caused by the set back to strike the point *g* of the anvil *h*, the flame traveling by the time ring *i* and channel *j* to the shrapnel charge *b;* also in combination therewith an impact fuse comprising a hammer *k* carrying a primer *m* carried forward by its momentum against the point *n* of the anvil *h*, the flame passing through the channel *o* to the grenade charge *a*.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A shell for ordnance of the kind containing both a shrapnel charge and filling and a grenade charge, the said filling being packed in a high explosive in combination with means for causing the high explosive to detonate when the grenade charge detonates and to burn when the shrapnel charge explodes.

2. A shell containing shrapnel balls embedded in a matrix of high explosive, and means to detonate and means to ignite said matrix.

3. A shell containing shrapnel balls embedded in a charge of trinitrotoluol, in combination with means to detonate and means to ignite said trinitrotoluol.

4. A shell containing a grenade charge, a shrapnel charge, and shrapnel balls embedded in a matrix of high explosive, a detonator arranged to act on the grenade charge, and a time fuse arranged to act on the shrapnel charge.

5. A shell containing a grenade charge, a shrapnel charge, and shrapnel balls embedded in a matrix of trinitrotoluol between the grenade and shrapnel charges, an impact fuse arranged to detonate the grenade charge, and a time fuse arranged to ignite the shrapnel charge.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

CARL HELDT.

Witnesses:
L. M. HANSEN,
M. ALGER.