(No Model.)

H. ALLEN.

SHELL FUSE.

No. 562,061. Patented June 16, 1896.

Fig. 1.

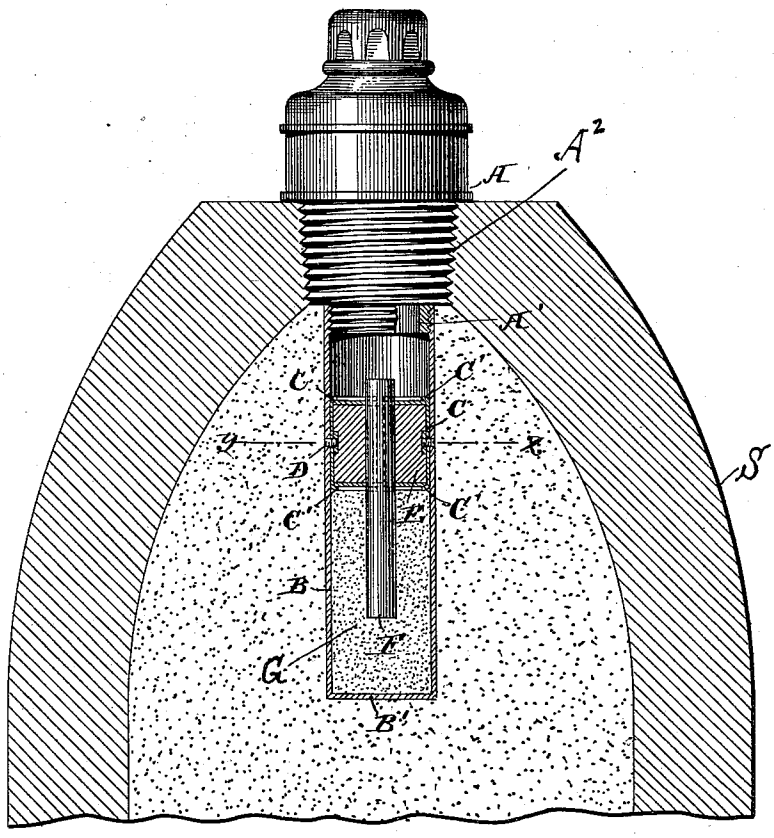
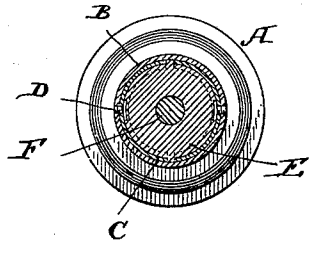


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRY ALLEN, OF LONDON, ENGLAND.

SHELL-FUSE.

SPECIFICATION forming part of Letters Patent No. 562,061, dated June 16, 1896.

Application filed January 17, 1893. Serial No. 458,683. (No model.)

To all whom it may concern:

Be it known that I, HARRY ALLEN, a citizen of the United States, residing at London, England, have invented new and useful Improvements in Shell-Fuses, of which the following is a specification.

My invention relates to shell-fuses; and it has for its object to provide means whereby the high explosives may be safely used in projectiles and certainly exploded when desired; and to these ends my invention consists in the features of construction and arrangement, substantially as are hereinafter more particularly pointed out.

Referring to the accompanying drawings, Figure 1 is a sectional view showing the shell provided with my improved shell-fuse; and Fig. 2 is a transverse section through the shell-fuse on the line *y z*, Fig. 1.

My invention is designed more particularly to provide means whereby the high explosives which are perfectly safe in handling and are capable of the highest destructive force can be discharged with perfect safety from an ordinary powder-gun and be exploded with certainty at the time or place desired, and while my invention may be utilized in connection with the high explosives which are known as the "nitro-derivatives," and consisting, essentially, of an oxidizing agent, such as a nitrate and a hydrocarbon, it may be used with other classes of explosives.

In carrying out my invention I arrange a shell-fuse, which may be provided with an ordinary time-fuse or a percussion-fuse, and which carries a detonator of that class which will insure the explosion or discharge of the high explosives contained in the shell, and I will now proceed to describe what I consider to be the preferred embodiment of my invention.

The shell S, which is indicated in outline only, may be of any ordinary or desired construction and may contain the high explosive arranged in any desired form—that is, it may be loaded into the shell in the form of powder and compressed therein, or it may be previously molded into the required size and shape and placed into the shell, or it may be placed in the shell in a plastic condition, when it will set hard. I find, however, that it can be used with equal effect in the form of a dry non-cohesive powder, and this is the most convenient and simple way of using it; but when it is used in a solid form it is provided with a recess for the reception of the shell-fuse, and the recess is preferably filled with some other high explosive in the form of loose powder.

The shell-fuse is shown as provided with a time-fuse A, which may be of any ordinary construction, and a case or tube B, which may be made of brass or other suitable metal or material, and which may have a closed end B′, and is screwed onto a nipple A′, projecting from the inner end of the time-fuse. This time-fuse is also provided with a threaded nipple A^2, by which it may be secured to the nozzle of the shell.

Within the tube B are two short lengths of smaller semitube-pieces C, fitted into B and secured thereto, two small screws D, passing through holes in B and screwing into the inner tube-pieces C, which, if desired, may be thickened at those points, as shown in the drawings, to increase the hold of the screws. The ends of the tube-pieces C are turned over, as shown at C′, to afford a holding for a block E, of india-rubber, cork, or other shock-absorbing material, through the center of which passes the fulminate detonator F, being thus completely held in the rubber block E. The edges of the tube-pieces C, as shown in the drawings, preferably do not meet, so as to allow freedom and convenience in inserting these pieces with the rubber block between them into the tube B. The portion of the tube B between the holding device C E and the end of the tube may be filled with the powder explosive G, as indicated in Fig. 1. I find it desirable that the tube B should be closed in at the end B′, so as to protect the powder around the detonator from the effect of the shock when the projectile is discharged from the gun, which shock has the effect of compressing the explosive, which if in the form of powder would be likely to discharge the detonator if it were not protected in the manner indicated.

While various detonators may be used, I prefer to use a fulminate-of-mercury detonator, and in operating the flash from the time or percussion fuse passes from the fuse to the

detonator inside the tube, and thus it ignites the detonator, which, exploding, causes the explosion of the high-explosive shell.

It will be seen that the detonator is held elastically in the shock-absorbing material, so that there is no danger of exploding it when the projectile is fired; but it can be safely used to produce the explosion of the shell at the proper time.

What I claim is—

1. A shell-fuse comprising the case, the semi-tube-pieces secured thereto, the shock-absorbing material mounted in the tube-pieces and a detonator mounted in the block, substantially as described.

2. The combination with the shell, of a shell-fuse secured to the nozzle of the shell and having a casing provided with an elastic shock-absorbing block, and a detonator mounted in the block, substantially as described.

3. The combination with the shell, of a shell-fuse comprising a casing, an elastic shock-absorbing block in the casing, and a detonator mounted in the block, and loose powder filling the recess around the fuse, substantially as described.

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

HARRY ALLEN.

Witnesses:
HAROLD WADE,
THOMAS LAKE.