No. 890,900. PATENTED JUNE 16, 1908.

M. W. GILMARTIN.

EXPLOSIVE SHELL.

APPLICATION FILED OCT. 12, 1905.

2 SHEETS—SHEET 1.

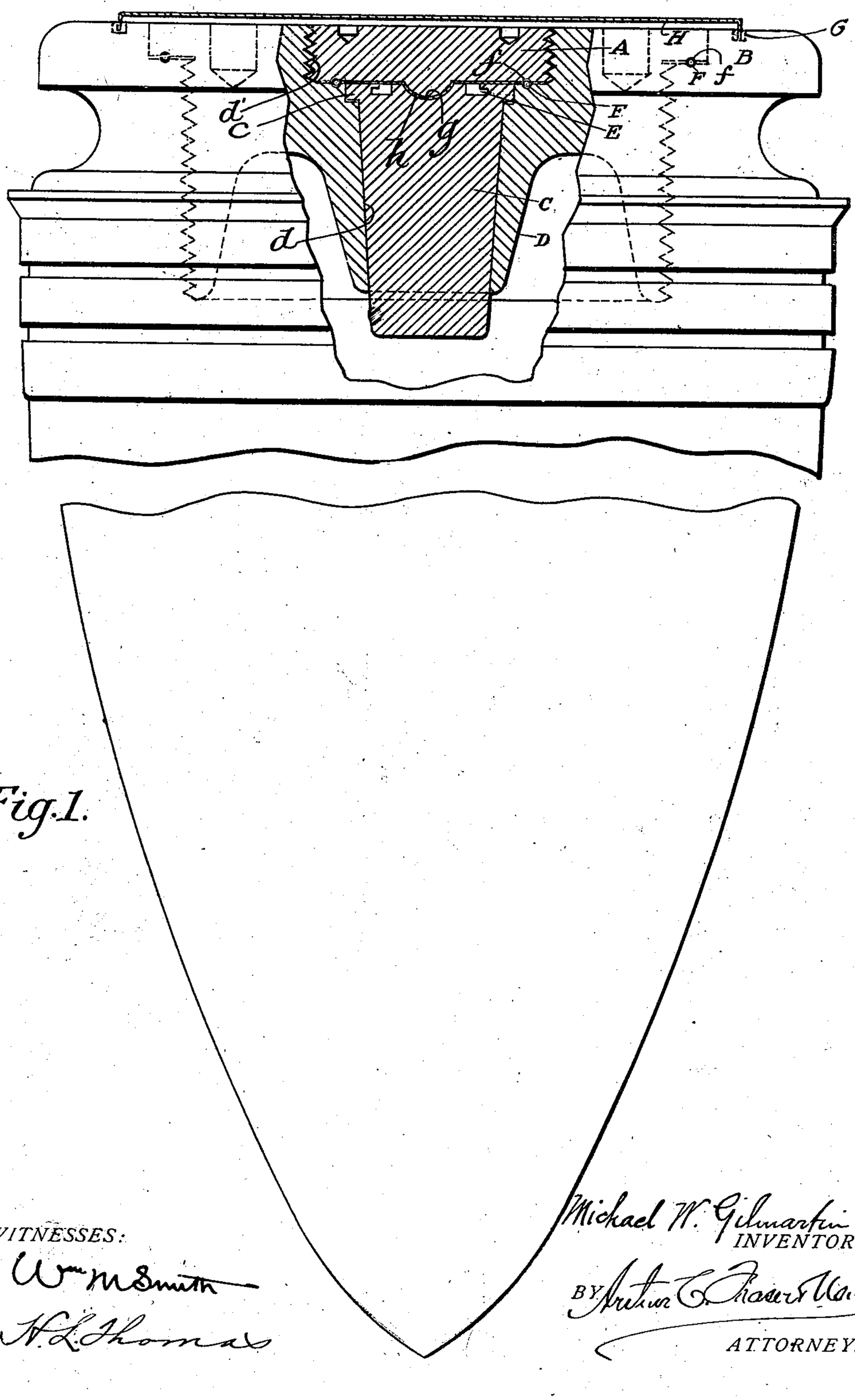

Fig. 1.

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2 SHEETS—SHEET 2.

FIG. 2.

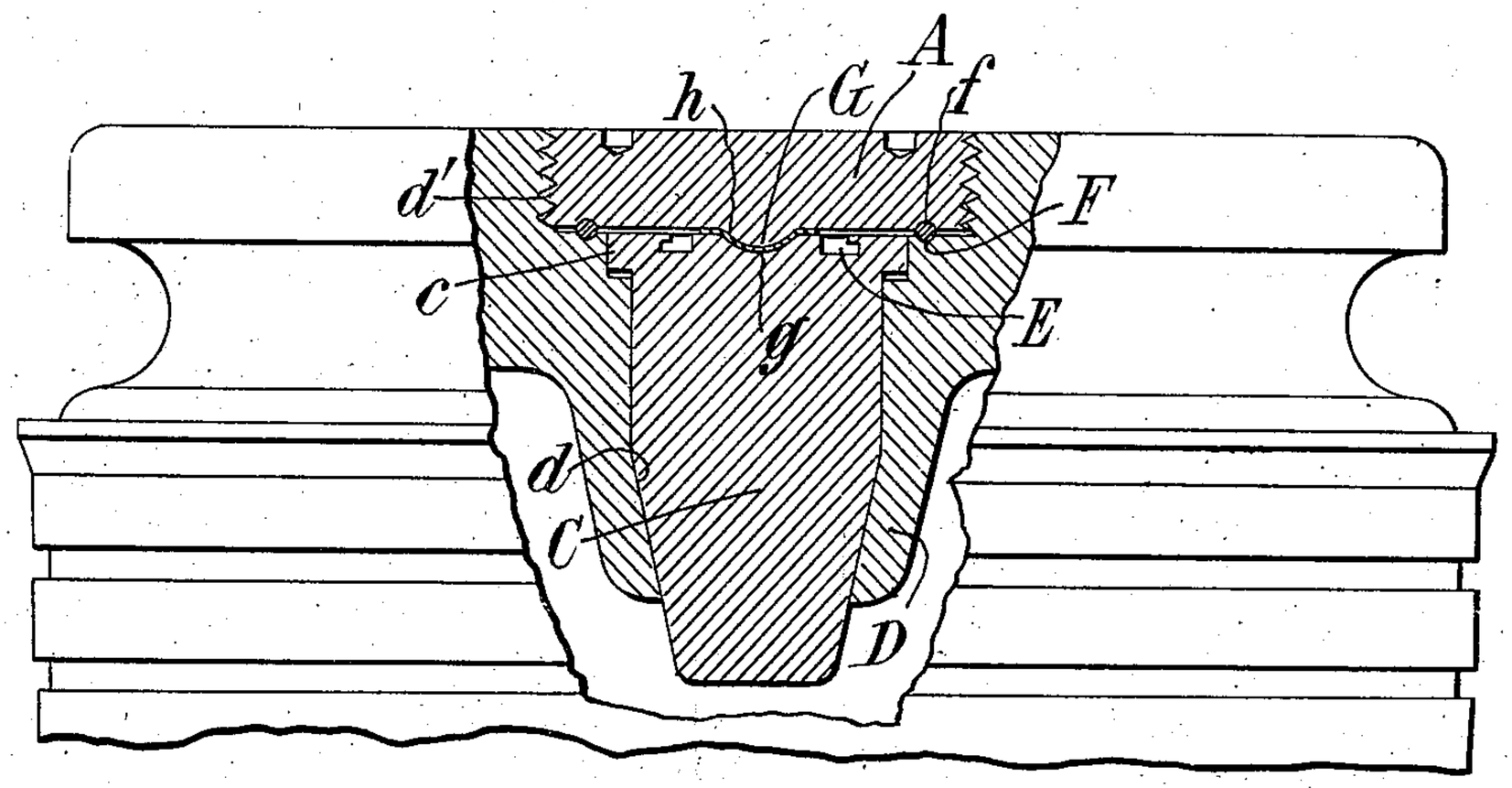
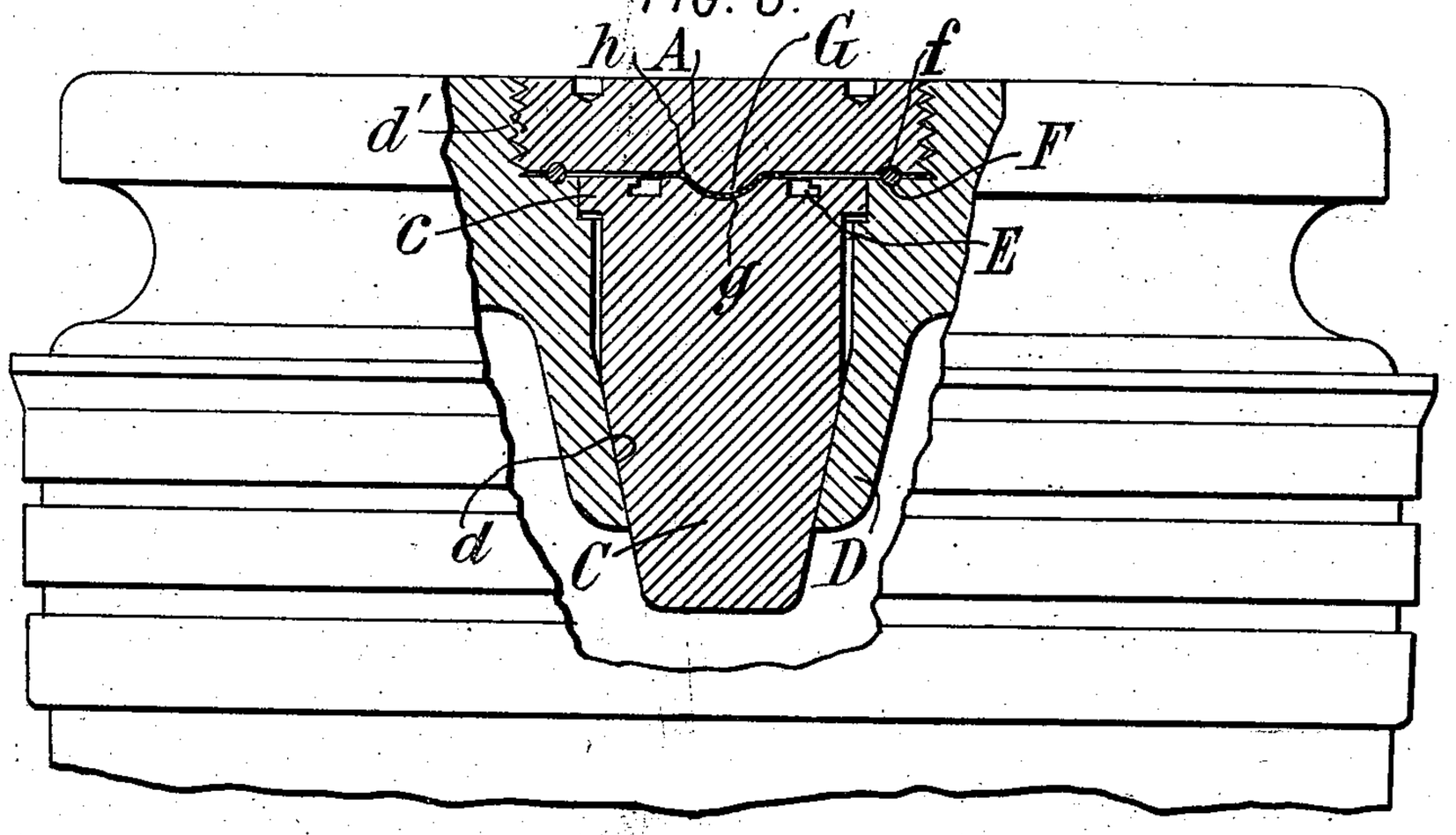


FIG. 3.



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UNITED STATES PATENT OFFICE.

MICHAEL W. GILMARTIN, OF THE UNITED STATES NAVY, ASSIGNOR TO E. W. BLISS COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF WEST VIRGINIA.

EXPLOSIVE SHELL.

No. 890,900. Specification of Letters Patent. Patented June 16, 1908.

Application filed October 12, 1905. Serial No. 282,479.

To all whom it may concern:

Be it known that I, MICHAEL W. GILMARTIN, a chief gunner in the United States Navy, and a citizen of the United States, residing at 448 East Fifty-eighth street, in the county of New York and State of New York, have invented a new and useful Improvement in Explosive Shells.

My invention relates to projectiles and is more particularly directed to improving the present construction of explosive shells in regard to the fuses thereof and the means for securing the fuses in place.

As the fuses of explosive shells are now constructed and secured, there is always danger of exploding the charge of the shell in loading and unloading the same. Also when the shell is fired it sometimes explodes owing to leakage of gas past the fuse, but there is especial danger when it becomes necessary to withdraw the fuse after the shell has been stored for a long time, the friction set up often generating enough heat to explode the shell with disastrous results, as is well-known.

My invention, which is designed to obviate these dangers, is illustrated in the accompanying drawings, in which

Figure 1 represents a vertical, longitudinal section of the base of a shell provided with my improvements. Figs. 2 and 3 are detail views of modifications of my invention.

In Fig. 1 B represents the shell, D the base-plug, which is customarily present in shells of large caliber, provided with a tapered hole or socket *d*, as shown, for the reception of the conical fuse C, and a recess *d'* to receive the fuse-plug A. In shells of small caliber the recess and socket for the fuse and base plug are formed directly in the base of the shell.

The fuse C has a flanged head *c*, as usual, which is adapted to bear against the shoulder in the base plug D, or shell-base formed between the recess and tapered socket. The fuse is provided with some means for positively engaging an extracting tool or the like, as distinguished from a mere wall extending in the direction of movement of the fuse during withdrawal. Such means for positively engaging the tool is preferably arranged in the outer end of the fuse and preferably comprises sockets such as E having an overhanging part under which the tool can be placed so that the engagement is positive and effective. Grooves F are formed in the adjacent faces of the base-plug D and fuse-plug A, in which is placed a soft metal ring *f*, which serves as a gas-check when compressed between said faces. When the base plug D is used, similar grooves F are formed in the head thereof and the base of the shell and a similar soft-metal ring *f* is placed therein to act as a gas-check.

Fuse-plug A is provided with a centrally projecting, substantially semi-spherical nipple G and the head of the fuse C is provided with a conjugate recess *g*, the latter being filled with soft metal *h*, such as Babbitt metal, so that the nipple G' on the plug A, when the latter is screwed home, will force the fuse inwardly in a straight, axial direction, without turning the fuse and without excessive friction between the latter and the fuse-plug. Of course, the nipple may be on the fuse and the recess in the fuse-plug, if desired.

Experience has shown that the most dangerous operation in unloading shells is the unscrewing of the fuse as powder often cakes solid in a shell, that has been stored for a long time aboard ship, and adheres to the bottom of the fuse. An attempt to unscrew a fuse with powder so caked is likely to cause an explosion, due to the friction between the end of the fuse and the caked powder, and this is liable to occur even in shells using burster bags, the powder often leaking through the bag after the latter has become rotton or punctured, and a small amount of powder clinging to the fuse is likely to explode the shell, due to the mixing together of the powder and rust from the shell.

In loading shells having threaded fuse-holes, particles of powder lodge in the screw-threads and are likely to be exploded by the friction generated in screwing the fuse home. By my invention the fuse is seated and withdrawn without any rotary motion at all, so that the friction between the fuse and its tapered hole is practically *nil*. As the contacting walls of the socket and fuse are tapered their surfaces separate laterally as the

fuse is withdrawn, so that an upward movement of a few thousandths of an inch is sufficient to remove all contact between the fuse and the walls of the hole. In loading the fuse is placed in its hole and the fuse plug A screwed in until the nipple G' of the latter engages the anti-friction washer of soft metal in the recess in the head of the fuse, when further screwing down of the plug A forces the fuse home in a straight, axial direction and without any rotary motion. It will be understood, however, that it is not necessary that the entire contacting surfaces of the socket and fuse shall be tapered. In Fig. 2 I have shown a construction wherein part of the fuse wall and socket is cylindrical. It is important, however, that the contacting walls shall be tapered at the inner ends of the fuse. In Fig. 3 I have illustrated a similar construction in which the walls of the outer end of the socket are spaced somewhat apart from the walls of the fuse. In this construction, as in Fig. 2, the inner end of the fuse and socket are tapered. Other constructions may be adopted in which there is a lateral separation of the surfaces as the fuse is withdrawn.

By my invention the use of the usual copper gas check H is dispensed with, although it may be used, if desired.

While I have described in detail one form of my invention, it will be understood that I do not wish to be limited to the construction shown as various modifications may be made therein without departing from the essential features thereof.

What I claim is:—

1. A projectile having a removable fuse, such fuse having means for positively engaging a tool or the like adapted to withdraw it from its seat, such projectile and fuse having surfaces fitting closely together, such surfaces being so disposed with relation to the direction of movement of the fuse during withdrawal that they separate laterally as the fuse leaves its seat.

2. A projectile having a socket and a fuse removably seated in said socket, the contacting walls of said parts being tapered so that their surfaces separate laterally as the fuse leaves its seat, said fuse having means for positively engaging a tool or the like, whereby it may be withdrawn from its socket.

3. A projectile having a socket, and a fuse removably seated in said socket, the contacting walls of said parts being smooth and tapered so that their surfaces separate laterally as the fuse leaves its seat, said fuse having means for positively engaging a tool or the like, whereby it may be withdrawn from its socket.

4. A projectile having a socket, and a fuse removably seated in said socket, the contacting walls of said parts being tapered so that their surfaces separate laterally as the fuse leaves its seat, and said fuse having an overhanging part adapted for engagement with an extracting tool whereby such fuse may be withdrawn from its socket.

5. A projectile having a socket, and a fuse removably seated in said socket, the contacting walls of said parts being tapered so that their surfaces separate laterally as the fuse leaves its seat, and said fuse having means located at its outer end for engaging a withdrawing tool.

6. A projectile having a socket, and a fuse removably seated in said socket, the contacting walls of said parts being tapered so that their surfaces separate laterally as the fuse leaves its seat, said projectile having a recess surrounding said socket, said fuse having a flanged head fitting said recess, and said head having means for positively engaging an extracting tool whereby said fuse may be withdrawn from its seat.

7. A projectile having a socket, a fuse fitting said socket, the contacting walls of said parts being formed so that they separate laterally as the fuse leaves its seat, said fuse being closed at its outer end, and being provided with means for positively engaging a tool or the like whereby such fuse may be withdrawn from its socket.

8. A projectile having a removable fuse, said projectile and fuse having surfaces fitting closely together, such surfaces being so disposed with relation to the direction of movement of the fuse during withdrawal that they separate laterally as the fuse leaves its seat, said fuse having means for engaging a tool or the like, such means being adapted to be engaged without disturbing the operating parts of the fuse.

9. A projectile having a socket, a fuse fitting said socket, means for retaining said fuse therein, and an antifriction member between such means and said fuse.

10. A projectile having a socket, a fuse fitting said socket, means for retaining said fuse therein, and a soft metal anti-friction member between such means and said fuse.

11. A projectile having a socket, a fuse fitting said socket, means for retaining said fuse therein, and an axially arranged antifriction member between such means and said fuse.

12. A projectile having a tapered socket, a tapered fuse fitting therein, a plug adapted to retain said fuse in place, and an antifriction member between said plug and fuse whereby said fuse may be forced to its seat without rotation.

13. A projectile having a base plug formed with a tapered socket, a tapered fuse therein, a fuse plug screwing in said socket and retaining said fuse therein, a packing gasket

between said base plug and the projectile body and a packing gasket between the base plug and fuse plug.

14. A projectile having a base plug formed with a tapered socket, a tapered fuse therein, a fuse plug screwing in said socket and retaining said fuse therein, and an antifriction member between said fuse plug and fuse, a packing gasket between said base plug and the projectile body and a packing gasket between the base plug and fuse plug.

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