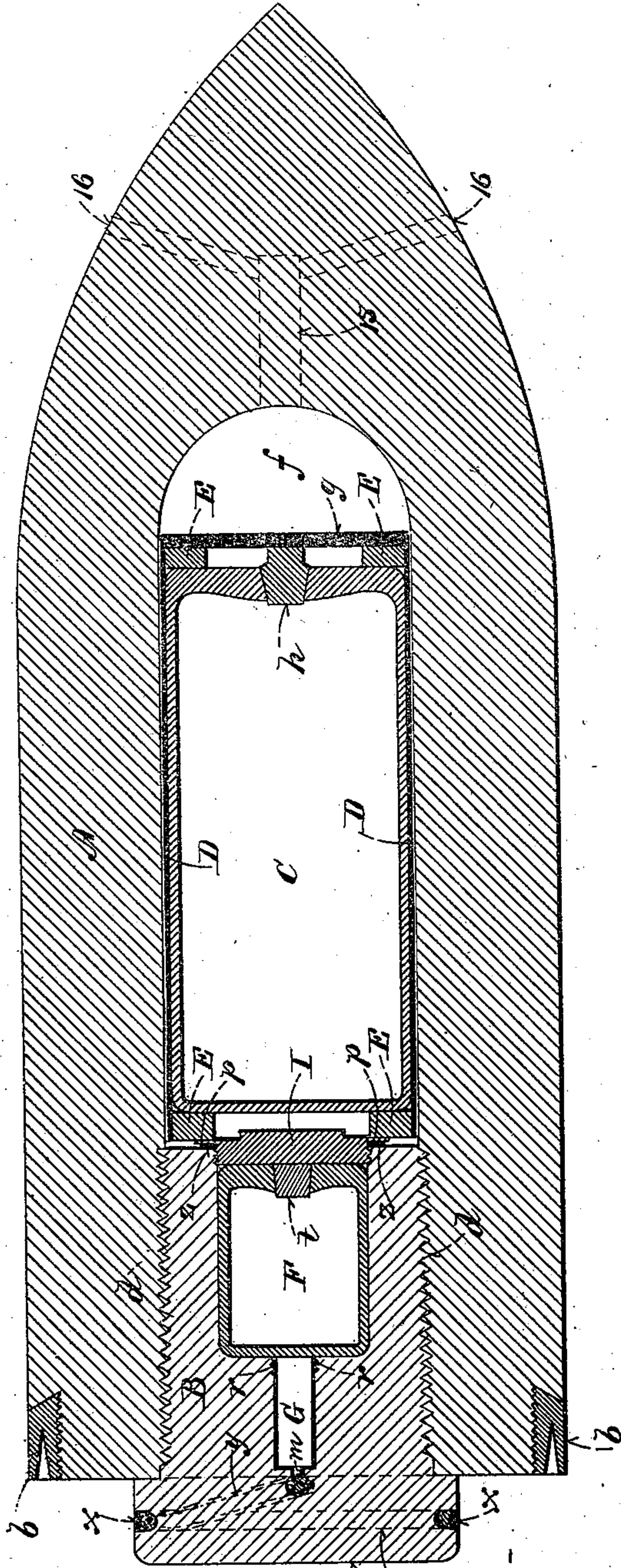


(No Model.)

C. P. WINSLOW.
NITROGLYCERIN SHELL.

No. 494,696.

Patented Apr. 4, 1893.



WITNESSES=
Ashe
H. Dwyer

FIG-1-

FIG-2-

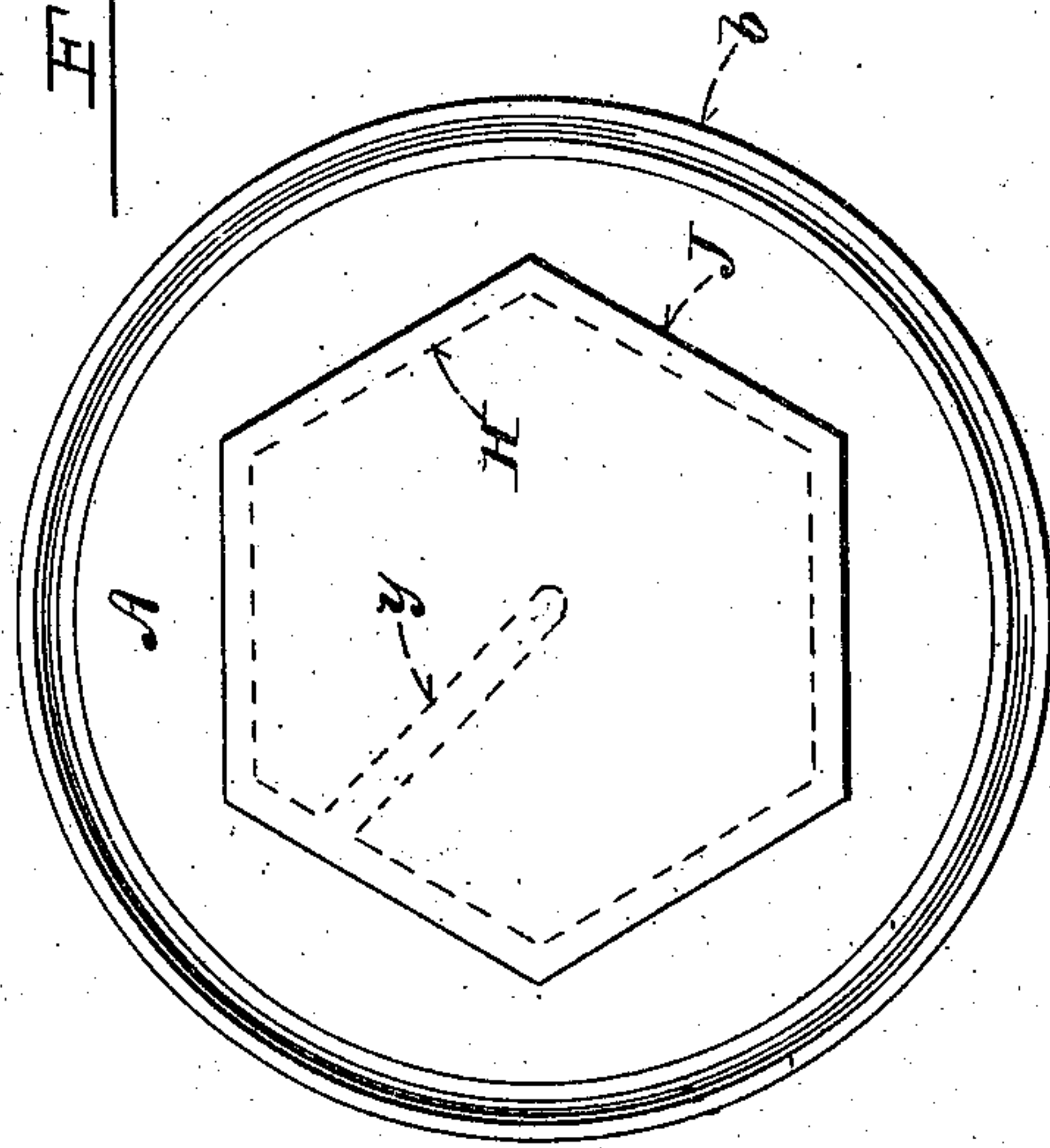
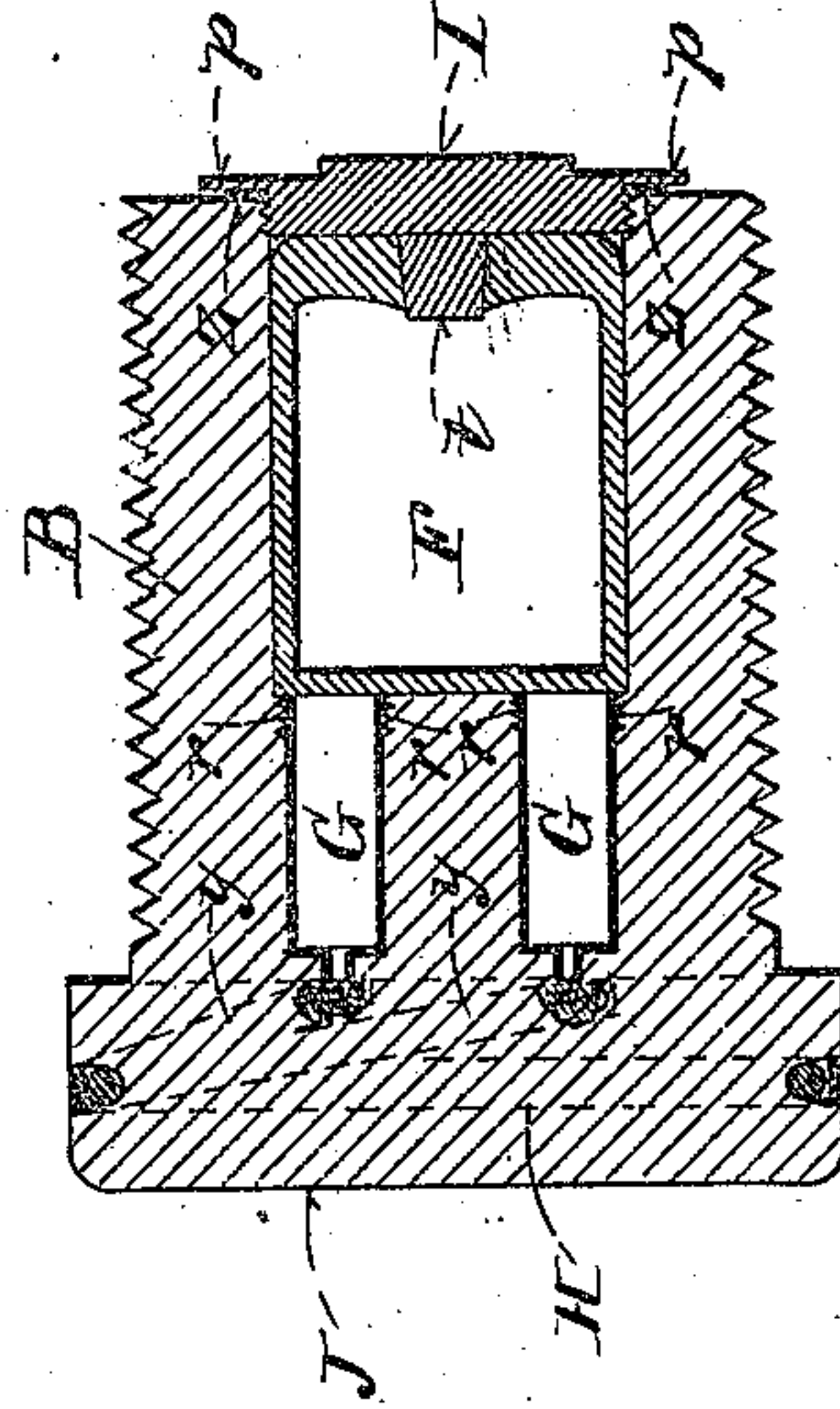


FIG-3-



INVENTOR=
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UNITED STATES PATENT OFFICE.

CHARLES P. WINSLOW, OF WESTBOROUGH, MASSACHUSETTS.

NITROGLYCERINE-SHELL.

SPECIFICATION forming part of Letters Patent No. 494,696, dated April 4, 1893.

Application filed April 4, 1892. Serial No. 427,652. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. WINSLOW, of Westborough, in the county of Worcester, State of Massachusetts, have invented certain new and useful Improvements in Nitro-glycerine-Shells, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved shell; Fig. 2 a butt-end elevation of the same; and Fig. 3 a sectional view illustrating a modification.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates especially to a shell for cannon with means whereby the nitro-glycerine or other similar explosive may be formed after the shell leaves the gun and automatically explode by the impact with the object fired at; or such explosion so timed that it will occur after the shell has penetrated such object.

In the drawings, A represents the shell of the cartridge which is of the ordinary conical form and is provided at its butt with the usual soft metal sabot, b. The shell is chambered centrally and longitudinally and the mouth of the chamber is tapped and screw-threaded at, d. The bottom of the chamber is concave, as shown at, f, in Fig. 1.

A can, D, of tin or similar material is constructed to fit closely into the chamber, its bottom, g, terminating at the beginning of the curve of the bottom of said chamber.

A close fitting vial or bottle, C, of frangible material is disposed in the can and is provided with a stopple, h. Said vial is provided at its ends with a cushion, E, comprising rings of rubber or similar material. A screw-plug, B, is turned into the threaded mouth, d, of the chamber until it engages against the outer cushion ring, E, forcing it against the bottom of the vial which is thus held tightly between said rings. Said plug is provided with a head, J, which is hexagonal in elevation, as shown in Fig. 2, and which overlaps the mouth of the chamber. The plug, B, from its inner

end is chambered centrally and longitudinally to receive a vial of frangible material, F, of preferably one tenth the capacity of the vial, C. A stopple, t, closes the mouth of the vial, F. The mouth of the chamber containing the vial, F, is interiorly screw-threaded to receive a thumb-screw or plug, I, of soft metal which closes said chamber from the main shell chamber when the plug, B, is in position.

Centrally from the bottom of the chamber containing the vial, F, and in alignment a small chamber, G, is constructed to contain the cap or fulminate. The mouth of the chamber is interiorly screw-threaded at, r, to receive, if its use is deemed essential, a screw-plug of soft metal.

In a head, J, of the plug, B, a peripheral groove, H, is constructed to contain a time-fuse which is disposed therein and secured by a piece of soft metal, x, plugging the mouth of said groove. The groove is continued diagonally at, y, through the head until it registers with a touch-hole or nipple, m, opening into the fulminate chamber, G.

The cap, I, closing the mouth of the chamber containing the vial, F, is flanged at, p, to overlap the edges of said mouth so that pressure from the chamber containing the large vial will not disconnect or force in said plug, I. A gasket of rubber, z, is interposed under the flange, p, to retard the action of acid in the main chamber on the soft metal plug, I.

In use the vial, C, is filled with aqua-regia or a solution containing sixty parts of sulphuric-acid and thirty parts of nitric acid. Said vial in its can, D, is then disposed in the shell chamber. The chamber, G is filled with fulminate of mercury and a time-fuse is disposed in the groove, H, in such manner that its end may be ignited from the explosion of the powder in the gun. The vial, F, is filled with glycerine and secured in its chamber in the plug, B, by the screw-cap, I. When the shell is fired from the gun the jar of the explosion will fracture the vials, C F. The force of the jar as the shell leaves is from its point rearwardly, so that the plug of soft metal, I, flanged at, p, as described, is not displaced from the mouth of its chamber. by the explosion of the gun. As the shell meets the object at which it is fired the force of the impact drives the plug, I, forward from the

mouth of its chamber into the main shell chamber, permitting the contents of the two vials to mingle which results in the immediate formation of nitro-glycerine. When the fire of the fuse in the groove, H, reaches the nipple, *m*, leading to the fulminate chamber, G, said fulminate is immediately ignited causing the explosion of the nitro-glycerine previously formed and the fracture of the shell after it has penetrated its object. By thus arranging the parts all danger resulting from handling the shells is obviated the only immediate explosive therein being the small quantity of fulminate held in the chamber, G, which is fully protected from the force of any percussion that would be sufficient to explode it.

The elements for forming the nitro-glycerine being separated by the metallic cap, I, and the vial, C, being protected by its rubber cushions a jar sufficient to displace said cap, I, is necessary before the contents of the vials mingle. Moreover, I dress the cartridge of fulminate with which I fill the chamber, G, with a covering of rubber and asbestos which renders it impervious to such amount of heat as would be received by the shell from the firing of the gun. It is designed to turn the cap, I, into the plug, B, such a short distance that as little resistance as possible will be offered to its displacement by the impact of the shell, but to provide against the contingency of its non-displacement at the proper time. I can, if desirable, form two fulminate chambers, G G, as shown in Fig. 3. These are connected at different points with the time-fuse so that said fuse will explode one fulminate cartridge to break the vial, F, and drive its contents into the main chamber for forming the nitro-glycerine, and immediately thereafter the second fulminate will ignite and cause the explosion of the shell.

I do not confine myself to using glycerine in the vial, F, as ordinary tallow or any other animal fat may be used, if preferred, and the same may be disposed in the main chamber around the acid vial to be attacked by said acid as soon as said vial is broken, without departing from the spirit of my invention, the salient feature of which is to provide the shell with apparatus and materials whereby an explosive may be automatically formed after the shell has left the gun and ignited or set-off either by the force of the impact of the shell with the object at which it is discharged or by a time-fuse after the shell has penetrated said object.

The device described may also be used as a torpedo. This may be done by tapping into the concave bottom, *f*, of the main chamber,

forming a supplemental chamber, 15, (see dotted lines in Fig. 1) for containing an explosive compound which may be fired by contact with water. The mouth of the chamber, 15, will be plugged by a cap of soft metal to keep the nitro-glycerine when formed in the main chamber away from such explosive. Two ports, or ducts, 16, will open from the explosive chamber, 15, through the point of the shell through which water will enter when the shell is immersed. This will set off the explosive and explode the nitro-glycerine in the same manner as described for the fulminate which in this form is omitted. All the essential features of a torpedo are thus attained with the added safety of firing the explosive after leaving the gun.

Having thus explained my invention, what I claim is—

1. A nitro-glycerine shell provided with an internal chamber, and a screw-threaded butt also having a chamber therein, said chambers carrying the explosive elements; and a screw threaded plug inserted in said butt separating the butt and shell chambers, said plug being displaced by the impact of the shell whereby the elements are mixed when the shell strikes an object.

2. A nitro-glycerine shell having a frangible vessel therein; a detachable butt; a frangible vessel disposed in a chamber in said butt; a partition separating said vessels and removable by the impact of the shell; a fulminate chamber in the butt opening into its vessel chamber; and a groove in the butt connecting with the fulminate for receiving a time-fuse, substantially as described.

3. A nitro-glycerine shell having a frangible vessel, C, disposed therein; the screw-butt; the frangible vessel, F, disposed in a chamber therein opening into the shell chamber; the detachable plug, I, separating said chambers; the fulminate chamber, G, in said butt; and the fuse groove, H, connecting with the nipple of said chamber, all being arranged substantially as specified.

4. A nitro-glycerine shell having a frangible vessel disposed therein; a chambered screw-butt; a frangible vessel in said chamber; a flanged screw-plug in the mouth of said chamber arranged to be dismounted by the impact of the shell; a fulminate chamber opening into the butt chamber; and a fuse port in said butt connecting with the nipple of said fulminate chamber, substantially as described.

CHARLES P. WINSLOW.

Witnesses:

K. DURFEE,
O. M. SHAW.