

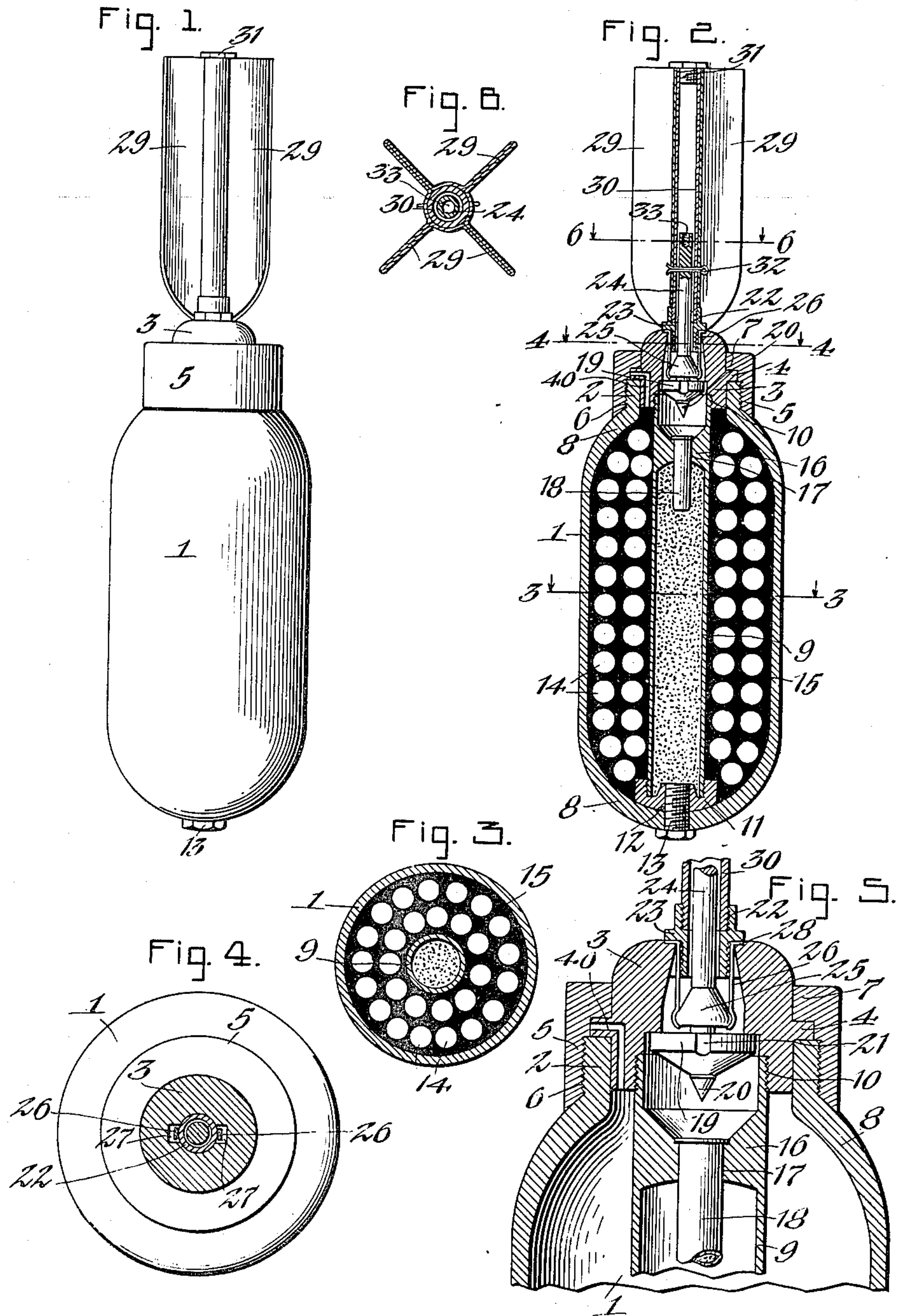
P. H. KANE.
AERIAL PROJECTILE.

APPLICATION FILED MAR. 24, 1916. RENEWED JUNE 20, 1917.

1,298,222.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.



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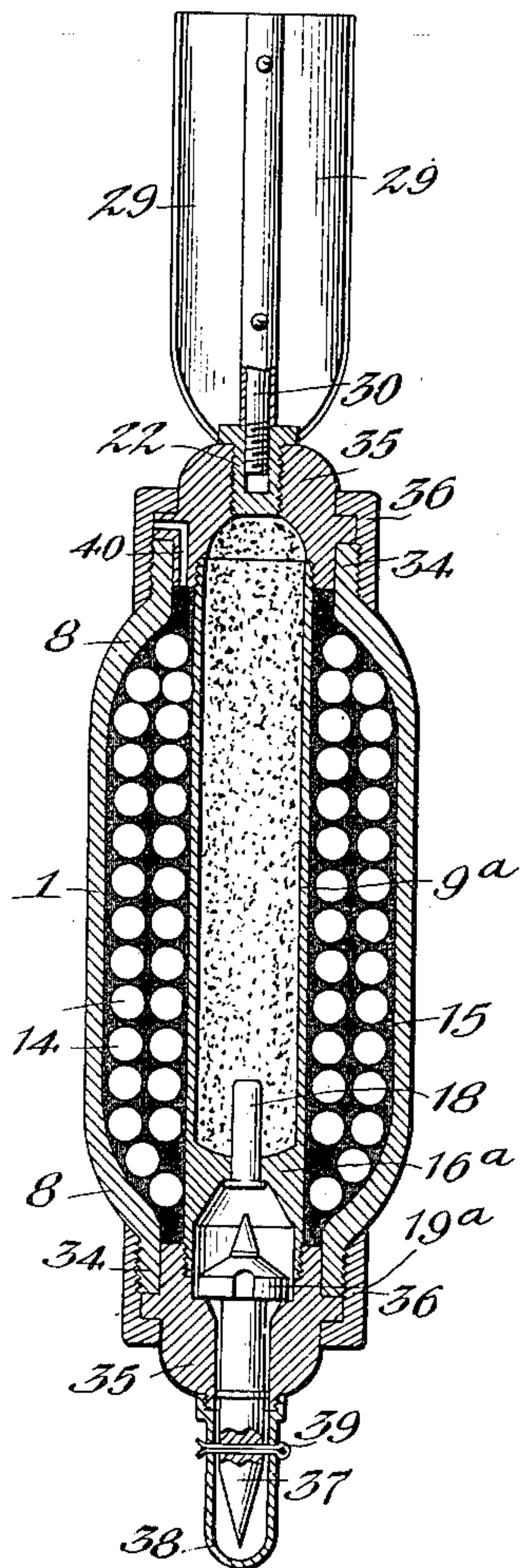
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Fig. 7.



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AERIAL PROJECTILE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PATRICK H. KANE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Aerial Projectiles, of which the following is a specification.

This invention relates to a projectile which may be used as an aerial bomb or an aerial high-explosive shell.

Its object is the provision of an effective device of this character which can be produced at comparatively small cost.

In the accompanying drawings:

Figure 1 is a side elevation of the projectile in the form of an aerial bomb. Fig. 2 is a sectional elevation thereof. Figs. 3 and 4 are transverse sections on the correspondingly-numbered lines in Fig. 2. Fig. 5 is an enlarged vertical section of the upper portion of the bomb. Fig. 6 is an enlarged transverse section on line 6—6, Fig. 2. Fig. 7 is a sectional elevation of a modified construction of the bomb.

Similar characters of reference indicate corresponding parts throughout the several views.

Referring to the construction shown in Figs. 1—6, 1 indicates the shell or casing of the bomb preferably constructed of steel and having a convex lower end and a contracted upper portion or neck 2 closed by a head 3 which is closely fitted into the neck and provided with an external flange 4 bearing against the upper end thereof and clamped therein by a union 5. This union is connected with the neck by a screw threaded joint 6 and provided at its upper end with an inwardly-turned flange 7 which overlaps the flange of said head. In its preferred form, the body-portion of the shell 1 is cylindrical and relatively thin, while its contracted upper and lower portions 8 are thickened, so that the body-portion tends to burst when exploded rather than the thickened end portions, thereby more effectually scattering its contents.

Arranged centrally and longitudinally within the shell is a chamber 9 adapted to contain a suitable explosive, such as nitroglycerin. This chamber is preferably formed by a tube extending practically throughout the length of the shell. Its upper end is externally threaded, and screwed into a socket or opening 10 in the lower end of

the head 3. The lower end of the tube is screwed or otherwise fastened in a flanged or socketed head 11 arranged within the lower portion of the shell and having a filling-opening 12 normally closed by a screw plug 13 passing through the bottom of the shell. The tube 9 is considerably smaller in diameter than the shell to leave an intervening annular space or chamber which is filled with balls or bullets 14 and a matrix 15 of rosin, sulfur or other suitable material. Near its upper end said tube is provided with a diaphragm 16 having a central aperture or seat 17 for a suitable percussion cartridge 18 which extends into the explosive contents of the tube. Movable vertically or longitudinally in the upper portion of the tube above said diaphragm is a hammer 19 carrying a firing pin 20 adapted to strike the cartridge to explode it. In the construction shown in the drawings, this hammer is cylindrical and guided by the walls of the tube 9 and the hollow head 3. It is provided in its edges with one or more vent passages 21 to prevent the formation of a vacuum above the hammer and to insure its free movement. In the upper end of said head is screwed or otherwise secured a bushing or hollow plug 22 having an external flange 23 which bears against the upper end of the head. The hammer 19 has a central stem 24 which extends upwardly through said bushing and is guided therein. This stem is provided a short distance above the hammer with a conical collar or enlargement 25 which in the upper position of the hammer interlocks with yielding holders or catches 26, as shown in Figs. 2 and 5. These holders are strong enough to retain the hammer in its elevated position under the ordinary jars and shocks incident to handling and shipment and yet sufficiently elastic to release the hammer by the impact of the shell on striking the ground or other obstruction, in order to fire the cartridge. In the preferred construction shown in the drawings, these holders consist of a pair of spring fingers having their upper portions arranged in longitudinal grooves 27 in the head 3 and provided at their upper ends with outwardly-turned lips 28 clamped between the upper end of said head and the flange of the bushing 22, while the lower ends of the fingers are shaped to embrace the convex lower portion of the collar of

the hammer-stem 24. Any other suitable holding means may however be employed, if desired.

Applied to the upper or rear end of the bomb is a suitable guide to cause it to descend head downward and in a straight course. The preferred guide shown in the drawings comprises vanes or wings 29 arranged lengthwise and radially on a central tube or hollow stem 30, the lower end of which is screwed or otherwise secured in the bushing 22. The upper end of this stem may be closed by a screw plug 31. As shown in Fig. 6, these vanes and their stems may be cheaply formed in one piece from a suitably-shaped blank of sheet metal.

To reliably keep the firing pin out of contact with the cartridge in shipping the bomb, the hammer-stem may be temporarily fastened to the vane-stem 30 by a cotter-pin 32 passed through these parts, as shown in Fig. 2, or by other suitable means.

In case the hammer or its stem should become bound slightly in the tube 30, the hammer-stem is reciprocated in the tube by any suitable means. For this purpose, said stem may be provided in its upper end with a screw threaded socket 33 adapted to receive the threaded end of a piece of wire inserted in the upper portion of the tube, the screw plug 31 being obviously removed for this purpose.

By providing the bombs with such vanes, they may be thrown promiscuously from an aeroplane or other elevation either head or tail down, the vanes righting them and insuring their descent head down.

Instead of arranging the hammer and firing pin at the upper or tail end of the bomb, it may be arranged at its front or lower end, if desired. Such a modified arrangement is shown in Fig. 7. In this case, the shell of

the bomb is provided with a contracted neck 34 at its lower end as well as its upper end and a head 35 is secured in this lower neck by a union 36 similar to that at its opposite end. The central tube 9^a containing the explosive is provided with a cartridge-supporting diaphragm 16^a near its lower end, leaving a chamber below the diaphragm in which the hammer 19^a plays. Extending downwardly from the hammer is a pointed pin or stem 37 which extends through the bore of the lower head 35 and is adapted to strike the ground or other obstruction, whereupon the shell slides downward on the arrested stem, causing the head of the cartridge to strike the firing pin of the hammer and exploding the bomb. During shipment of the bomb, its pointed stem is preferably covered by a protecting cap 38 screwed upon the contracted lower end of the adjacent head, and the hammer is reliably held out of engagement with the cartridge by a cotter pin 39 passed through the cap 38 and the stem, or by any other suitable means.

In order to permit any excess of the paste-like matrix to escape from the shell in filling it, one of its heads is preferably provided with one or more escape passages 40.

I claim as my invention:

A projectile comprising a shell closed at one end and open at the other, a head detachably secured in the open end of the shell, a flanged head arranged within the closed end of the shell and having a plugged filling aperture, a tube adapted to contain an explosive and detachably secured at its ends to said heads, said tube containing a cartridge seat, and a movable hammer guided in said tube and having a firing pin which faces said seat.

PATRICK H. KANE.