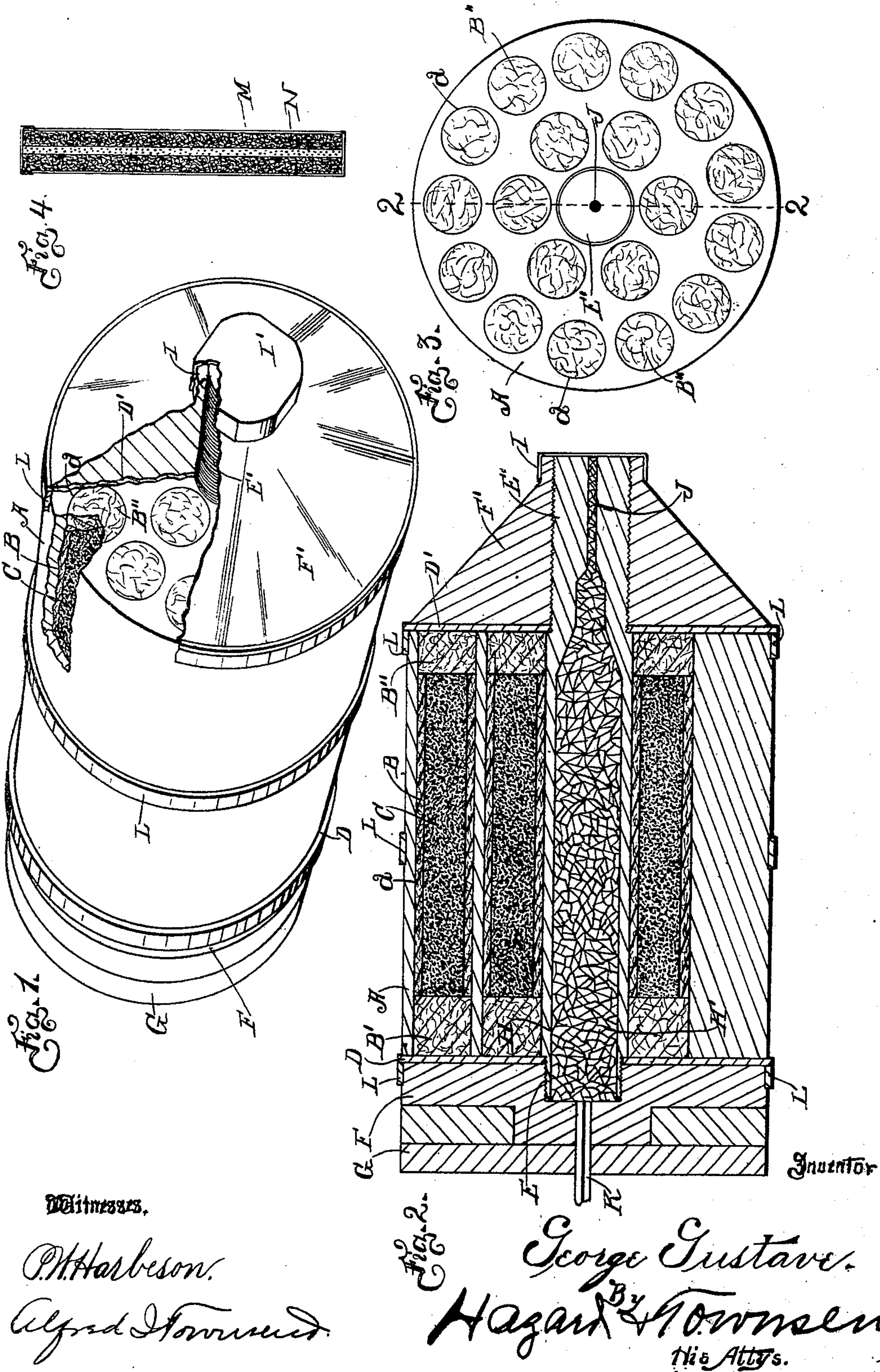


(No Model.)

G. GUSTAVE.
HIGH EXPLOSIVE PROJECTILE.

No. 574,061.

Patented Dec. 29, 1896.



Witnesses.

P. M. Harbeson.

Alfred Townsend.

George Gustave.

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UNITED STATES PATENT OFFICE.

GEORGE GUSTAVE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF
TO EDGAR S. JOSEPH, OF SAME PLACE.

HIGH-EXPLOSIVE PROJECTILE.

SPECIFICATION forming part of Letters Patent No. 574,061, dated December 29, 1896.

Application filed December 11, 1894. Serial No. 531,446. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GUSTAVE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in High-Explosive Shells, of which the following is a specification.

My invention relates to the construction of shells which are designed to contain large quantities of high-explosive materials and are adapted to be shot from a gun and exploded at a distance from the point from which they are shot either by concussion or by a time-fuse.

The object of my invention is to provide a strong shell, very simple of construction, comparatively very cheap to manufacture and easy to assemble, and which may be more easily loaded than former shells, and which, when loaded, can be handled without danger, and is specially adapted to be provided with the explosive charge and with fulminating or explosive cap just before the shell is inserted into the gun, thereby making it perfectly safe to handle the shell previous to the time of firing.

My invention embraces a high-explosive shell comprising an integral metal body provided with explosive-containing chambers extending therethrough from end to end and with two screw-threaded axially-arranged spindles or necks which project, respectively, from the opposite ends of the body, and with a detonating charge-containing axial bore extending forward from the rear end of the rear neck, a conical head screwed upon the front neck, and a base-cap screwed upon the rear neck.

It also comprises other features of construction hereinafter described and claimed.

The accompanying drawings illustrate my invention.

Figure 1 is a perspective front view of my improved shell. A portion of the shell is broken away to disclose the position of the chambers containing the explosive material, &c. Fig. 2 is a longitudinal mid-section of my improved shell. Fig. 3 is a plan view of the top of the integral casing, showing the arrangement of the explosive-containing chambers with relation to the neck E'. Fig. 4 is a

sectional view of a charge of nitroglycerin prepared for use in my improved shell.

For safety I divide the charge of explosives into small charges and provide each separate charge with a suitable elastic packing between the explosive and the metal of the casing within which the explosive is contained, and thereby avoid any possibility of exploding the charges by any shock which may be caused by discharging the shell from the gun. This I do not claim.

In the drawings, A represents an integral metal body which is provided with a series or a plurality of chambers *a*, which are each provided with a lining B, of felt or other suitable elastic packing. The chambers *a* are arranged longitudinal the casing. The elastic packings B' B'' are arranged at the lower and upper ends thereof, respectively, when the charges are in position, between their ends and the ends of the chambers when closed. The high explosive C is arranged in the chambers, and each charge is entirely surrounded by elastic packing, so that the explosive is at no place in contact with the metal wall of the chamber.

Suitable closures for the ends of the chambers *a* are provided. As shown in the drawings, the body A is provided at its front and rear ends, respectively, with axially-arranged screw-threaded projecting spindles or necks E and E', which are comparatively small in diameter, while the independent compartments are arranged in one or more circles around the axis of the body. Lead packings D D' are arranged, respectively, upon the rear and front ends of the casing and surrounding the necks E E', respectively. A conical head F', provided with a nose I, is screwed upon the front neck E' and presses upon the lead packing D', thus to form a tight closure for the front end of the chambers *a*. The base-cap F is screwed upon the rear neck E and presses upon the lead packing D and forms a solid base for the shell and produces a perfect closure for the rear ends of the chambers *a*.

In order to avoid the liability of the impulse of the explosion within the gun being so excessively violent and sudden in its operation as to detonate the charge of high explosive in

the shell, I provide suitable elastic packing G, arranged upon the base of the shell to receive the impact of the explosive which propels the shell. This is not claimed as new.

5 II is a forwardly-tapering bore forming a central compartment arranged within the shell and extending from the rear end of the rear neck to the front end of the front neck.

In this compartment is placed the detonating charge or explosive II', which detonates the charge of high explosive. This explosive may consist of ordinary powder, or of fulminate of mercury, or any other explosive deemed desirable, and upon the nose I of the
15 head is secured a fulminate cap I', which is designed to be exploded by the force of the projectile striking against the object at which it is aimed. This cap communicates by means of the passage J with the explosive II' in the
20 chamber II, thus to detonate the high explosive.

The front tapering portion of the bore leaves the front or impact neck E' almost solid and consequently strong. It also prevents the
25 blowing out of the detonating charge forwardly, so that the detonating charge will act upon the high explosive with certainty.

In case it is deemed advisable to provide means for exploding the shell other than the
30 fulminate cap I a fuse is shown in Fig. 2, arranged at the base of the shell, and is designed to be ignited by the explosion of the charge which propels the shell and to cause the explosion thereof if from any cause the
35 fulminate cap fails to ignite the detonating charge.

When nitroglycerin is used, I provide tubes M, Fig. 4, of lead or other suitable material, filled with wool or cotton N, saturated with
40 the explosive, and arrange these tubes in the elastically-lined compartment a. The wool or cotton gives an elasticity to the charge of explosive which overcomes the effect of the inertia and prevents it from detonating by the
45 impulse of the charge which propels the shell.

By casting the body integral with the screw-threaded spindles or necks projecting therefrom, as shown, I am enabled to rigidly attach the head and base to the casing more

easily and quickly than with other constructions to form a shell which is, when assembled, practically a unit and made of only three pieces. Owing to the very simple construction and the small diameter of the only
50 screws employed, the shell can be assembled very quickly and with but little expenditure of force to screw the parts home, so that the work can be readily done on the field, thereby allowing the explosive material to be carried separately from the shell until near the
55 time when it is desired to use the same, and thereby insuring that the explosive material is not damaged or in poor condition.

The fulminate cap I', which is designed to explode by the concussion of the striking of
60 the shell, and thereby explode the detonating charge within the central compartment, may be quickly adjusted upon the neck just before the shell is inserted into the gun to be fired, and when the shell is uncapped the mouth of
70 the neck may be covered by a blank cap, which will insure perfect safety in the handling of the shell while being taken from the magazine to the gun.

Now, having described my invention, what
75 I claim as new, and desire to secure by Letters Patent, is—

The high-explosive shell set forth comprising an integral metal body provided with explosive-containing chambers extending there-
80 through from end to end and with the two screw-threaded axially-arranged spindles or necks E E', of comparatively small diameter, which project, respectively, from the opposite ends of the body beyond the ends of
85 the explosive-containing chambers, and with a forwardly-tapering detonating-charge-containing axial bore extending from the rear end of the rear neck to the front end of the
90 front neck; the conical head provided with the nose for the fulminating-cap and screwed upon the front neck; and the base-caps screwed upon the rear neck.

GEORGE GUSTAVE.

Witnesses:

JAMES R. TOWNSEND,
ALFRED I. TOWNSEND.