(No Model.)

W. T. SMITH.

SHELL FOR HIGH EXPLOSIVES.

No. 384,646. Patented June 19, 1888.

Fig. 1.

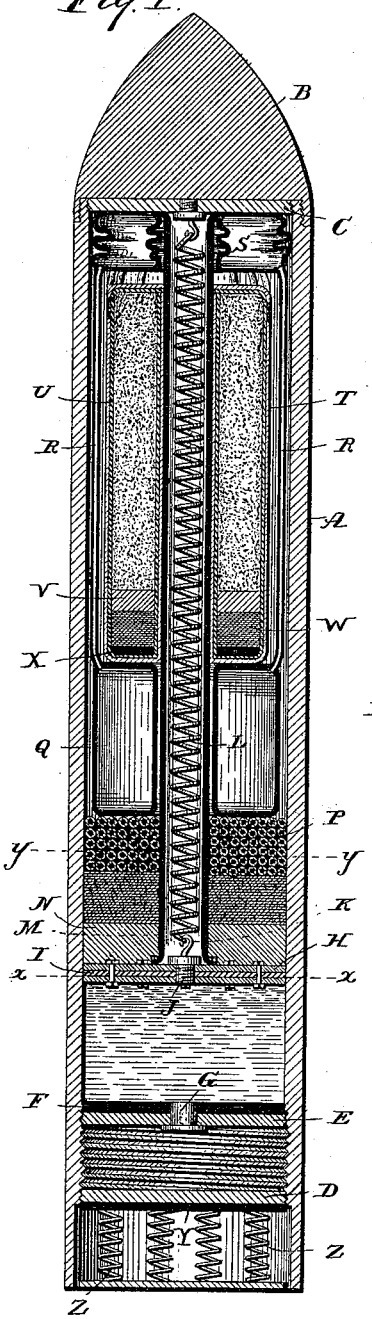


Fig. 2.

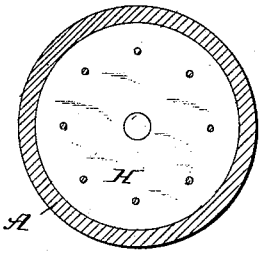


Fig. 3.

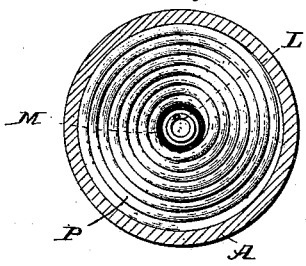
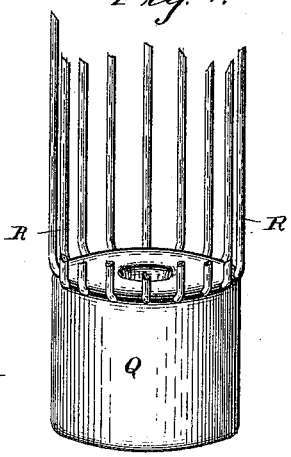


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM T. SMITH, OF BIRMINGHAM, ALABAMA.

SHELL FOR HIGH EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 384,646, dated June 19, 1888.

Application filed March 8, 1888. Serial No. 266,544. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. SMITH, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Projectiles, of which the following is so full, clear, and exact a description as will enable those skilled in the art to which this invention appertains to make and use the same, reference being had to the appended drawings, forming a part hereof.

This invention relates to certain new and useful improvements in projectiles, as will be hereinafter more fully set forth in the specification, and pointed out in the claims.

The object of my invention is to construct a projectile which shall be capable of carrying safely dynamite or other highly-explosive substances or compounds which are ignited by concussion.

Another object of my invention is to construct a shell or projectile possessing the above qualities in such a manner that it may be fired from any of the ordinary forms of ordnance.

A further object of my invention is to construct a projectile which shall not only be capable of carrying out the objects above set forth, but shall at the same time be so constructed that it will not discharge this highly-explosive substance or compound instantaneously with the striking of the projectile against the object at which it is aimed, but which will discharge said explosive in a fraction of time later and after said projectile shall have penetrated the object of its aim.

In the accompanying drawings, forming a part of this specification, and on which similar letters of reference indicate the same or corresponding features—

Figure 1 represents a vertical sectional view of my improved shell. Fig. 2 is a detail sectional view taken on the line *x x* of Fig. 1. Fig. 3 is a detail view taken on the line *y y* of Fig. 1. Fig. 4 is a detail view of the rubber bag Q and its attached flexible tubes.

The letter A designates the outer casing of an ordinary metallic shell, made of cast iron or steel, as may be desired, and terminating in a pointed end, B, and provided near said end with a transverse partition, C.

Secured within the lower end of the shell A is a transverse bottom plate, D, and above that a similar plate, E, its outer portion being covered with a rubber or gum coating, F, and through them extends an aperture provided with a plug, G. Above this is a further partition, H, the same consisting of two metallic plates with an intervening layer of felt, I, the two plates being clamped together by bolts, as shown, or in any desired manner. Secured in this partition is a screw-threaded plug, J, the same terminating at one end in a hook, K, and the plate C at the other end is provided with a similar plug and hook, and the two hooks are connected together by a spiral spring, L, extending from the one to the other. This spring L is inclosed within an elastic rubber tube, M, which is provided with flaring ends and connected to the plates by bolts, or otherwise, as may be desired, and extends through apertures provided in all the substances intervening between the two partitions H and C.

Above the partition H, I place a layer of gum, N, and above that a layer of felt and hair mixed, and on this I mount in the form of a coil a layer of hose, P, as more clearly seen in Fig. 3. On this layer of rubber hose P I place an india-rubber bag, Q, whose upper surface is provided with an annular series of flexible rubber tubes, R, extending around the sides of the cartridge up to the other rubber bag, S, and between the two bags and surrounded by the flexible tubes is the cartridge of dynamite.

The dynamite-shell consists of an outer casing, T, next to which, on the inside, I place a layer of wool, U, and within that I place the dynamite, which rests upon the wooden bottom V, which in turn rests upon the felt, W, which rests upon the rubber X, which is surrounded by the casing of the cartridge.

In that part of the shell between the partitions D and E, I create a vacuum, and in that portion between the partitions F and H, I place glycerine, alcohol, or other similar liquid.

Against the partition D, I place a block of rubber, Y, provided with a series of rearwardly-projecting spiral springs, Z, the ends of said springs being covered by a plate attached to them. This projectile is designed

to be placed in the ordinary forms of ordnance and fired with the usual charge of powder, which, acting first against the springs Z, sends the projectile from the gun in an easier manner than if it acted directly against the shell itself. The firing of the projectile loosens the plug G in the partition E, and the liquid immediately above begins to descend through the aperture, and everything above the liquid begins to gradually descend to the rear of the shell, the air in the bag Q ascending to the bag S, so that by the time the projectile has arrived at its destination the charge of dynamite will have receded from its former close quarters, and there will be considerable space between the upper end of the said charge and the partition C, so that on its striking the object of its aim the charge will be suddenly shot forward with considerable violence, and the concussion will produce the explosion of the dynamite at the moment of its penetration.

I do not wish to be understood as confining myself to the exact construction herein shown and described, for it may be varied somewhat without departing from the spirit of my invention, the essential feature of which is the constructing a projectile in such a manner that in its passage the charge of explosive will recede and leave a space above it, so that on its striking the object of its aim the charge will be shot forward violently and by its concussion explode at the moment the said projectile is penetrating the object of its aim or immediately thereafter.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a projectile, of an explosive movably mounted therein, an air-chamber at the rear of said explosive, and a liquid-containing chamber at the rear of said air-chamber, and having its front wall elastically connected with the front of the projectile.

2. The combination, with a projectile, of an explosive movably mounted therein, an air-chamber at the rear of said explosive, a liquid-containing chamber at the rear of said air-chamber, a chamber at the rear of said liquid-containing chamber containing a vacuum and formed on its top with an aperture opening communication therewith from the liquid-containing chamber, and a plug normally closing the said aperture.

3. The combination, with a projectile, of an explosive movably mounted therein and inclosed between flexible air-containing chambers, and a series of flexible tubes connecting the said chambers.

4. The combination, with a projectile and an explosive charge located therein, of air-cushions to either side of the said charge, a liquid-containing chamber behind the lower air-cushion, and a vacuum-chamber behind the liquid-containing chamber and having a perforation, and a plug normally closing said perforation and adapted to be displaced by the shock consequent upon the projectile forcibly leaving the gun.

5. The combination, with a projectile and the charge movably mounted therein, of an air-chamber at the rear of said charge, having a movable partition or base-plate at the rear end, and springs connecting the said partition with the front of the projectile.

6. The combination, with a projectile and the charge movably mounted therein, of an air-chamber at the rear of said charge, a liquid-containing chamber at the rear of said air-chamber, and a movable partition dividing said chambers, and a vacuum-chamber at the rear of said liquid-containing chamber and normally separated therefrom by a plug adapted to be displaced by the shock imparted to the projectile in firing the gun.

7. The combination, with a projectile and the charge movably mounted therein, of an air-chamber at the rear of said charge, a movable partition beneath the said charge, and layers consisting of an elastic, felt and hair, and another elastic between the said charge and movable partition.

8. The combination, with a projectile provided with partitions dividing the shell into compartments, of a yielding connection between two of the partitions, said yielding connection passing through the charge and its mountings and firmly yet yieldingly holding them in place.

9. The combination, with the projectile and the charge mounted therein, of an air-cushion at the rear of said charge, and a movable partition at the rear of said air-chamber and having yielding connection with the front of the projectile.

10. The combination, with a projectile and the charge, of an air-cushion supporting the said charge, an elastic packing at the rear of said cushion, a fluid-containing chamber at the rear of said packing, a movable partition between the said packing and fluid-containing chamber, a vacuum-chamber the front wall of which is formed with a perforation, and a plug normally closing said perforation.

11. The combination, with the projectile and its charge movably mounted therein, a movable partition at the rear of said charge, springs connecting the said partition with the front of the projectile, and a tube surrounding the said springs, whereby the same will not come into contact with the charge.

12. The combination, with the projectile and the charge, of air-cushions at the front and rear of said charge, flexible tubes connecting the said cushions, and a movable partition at the rear of the lower air-cushion and having elastic connection with the front of the projectile.

13. The combination, with the projectile and the charge, of air-cushions at the front and rear of said charge, flexible tubes connecting the said cushions, movable partition at the rear of the lower air-cushion having elastic

connection with the front of the projectile, and an elastic packing between the said movable partition and air-cushion.

14. The combination, with the projectile and the charge, of a wool packing surrounding the charge, air-cushions at the front and rear of the said charge, flexible tubes connecting the said air-cushions, movable partition at the rear of the lower air-cushion, spring connecting the said partition with the front of the projectile, and a flexible tube surrounding the said spring.

15. The combination, with the projectile, charge, air-cushions at either side of said charge, flexible tubes connecting said air-cushions, and an elastic packing immediately to the rear of the lower air-cushion, of a fluid-containing chamber to the rear of said packing, a movable partition dividing the said chamber and packing, spring connecting the said partition with the front of the projectile, flexible tube surrounding the said spring, a vacuum-chamber at the rear of the fluid-containing chamber and having a perforation in its front wall, and a plug normally closing the said perforation.

16. The combination, with a projectile and the charge movably mounted therein, of an air-chamber at the rear of said charge, a movable partition at the rear of said air-chamber and having elastic connection with the front of the projectile, and layers consisting of an elastic, felt and hair, and another elastic between the said charge and movable partition.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM T. SMITH.

Witnesses:
FRANZ MUELLER,
MARY E. SHAW.