No. 622,994. Patented Apr. 11, 1899.

C. N. CHAMBERS.

SHELL FOR HIGH EXPLOSIVES.

(Application filed June 17, 1898.)

(No Model.)

Fig. 1.

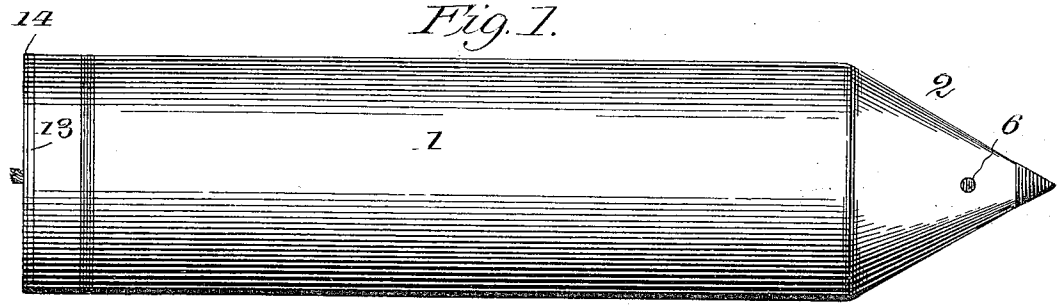


Fig. 2.

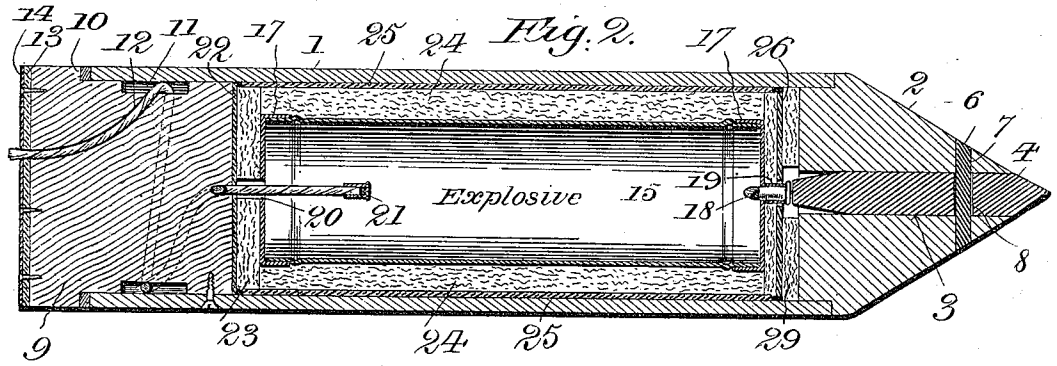


Fig. 3.

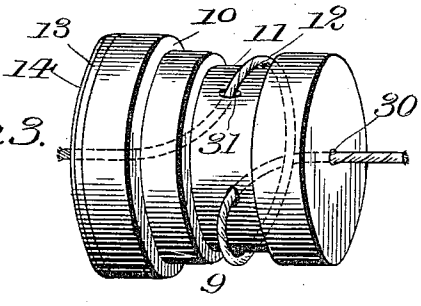


Fig. 5.

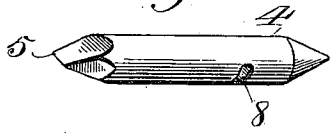
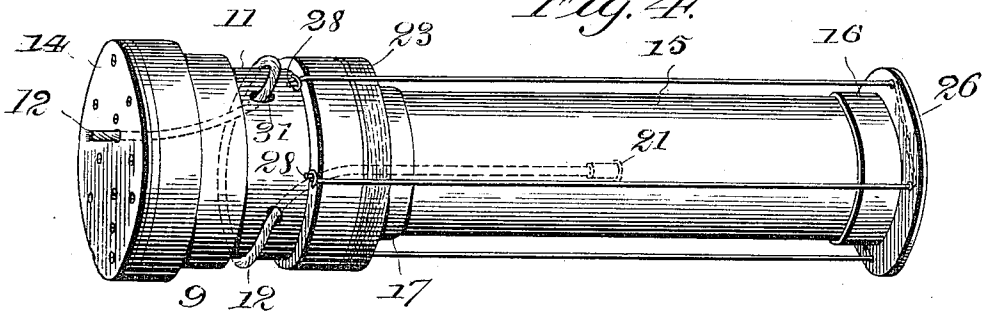


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES NUTEN CHAMBERS, OF COAL VALLEY, PENNSYLVANIA.

SHELL FOR HIGH EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 622,994, dated April 11, 1899.

Application filed June 17, 1898. Serial No. 683,731. (No model.)

To all whom it may concern:

Be it known that I, CHARLES NUTEN CHAMBERS, a citizen of the United States, residing at Coal Valley, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Shells for High Explosives; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to shells for dynamite and like high explosives, the object of the same being to provide means whereby the same may be exploded by impact against the object toward which it is discharged or by a time-fuse, and at the same time to provide means for protecting the dynamite or charge of explosive from danger of accidental explosion thereof due to the shock from the propelling charge in the gun or to electrical conditions caused by friction between the shell and the walls of the gun.

Another object of the invention is to provide for completely protecting and regulating the length of the time-fuse, as will hereinafter appear.

The invention consists in the construction and combination of parts hereinafter described and claimed.

In the drawings forming part of this specification, Figure 1 represents a side elevation of my invention. Fig. 2 is a central longitudinal section through the same. Fig. 3 is a detail perspective view of the butt of the shell with a time-fuse coil wound thereon. Fig. 4 is a similar view of the butt and the charge and its envelop, showing the means for attaching said charge to the butt; and Fig. 5 is a detail perspective view of the plunger or firing-pin.

Like reference-numerals indicate like parts in the different views.

The shell 1 is preferably cylindrical in form and constructed of cast-iron or other like material of sufficient strength to retain its contents in place. To the forward end thereof is secured a cone-shaped head 2, having a central longitudinal opening 3 extending therethrough, in which fits a plunger or firing-pin 4, having a tapering or contracted forward end, which when in its normal position forms a continuation of the tapering or cone-shaped head 2. The rear end of the plunger 4 is cut away upon opposite sides, forming a sharp edge portion 5. The said plunger or firing-pin is normally held in the position in which it is shown in Figs. 1 and 2 of the drawings by means of a break-pin 6, which extends through registering openings 7 8 in the head 2 and plunger 4, respectively. The said break-pin is preferably constructed of lead.

The butt 9 of the shell is preferably constructed of wood, the same being circular in cross-section and of a size adapted to fit snugly within the rear end of the casing 1. At the rear end of the butt a shoulder 10 is formed, which bears against the extreme rear end of the casing 1 and prevents the same from being inserted too far. At a point intermediate of the ends of the butt 9 an annular peripheral recess or groove 11 is formed, in which the time-fuse 12 is adapted to be wound. Upon the extreme rear end of the butt 9 is located a disk 13, of asbestos or other like material, the same being held in place by a metallic plate 14, which is screwed or otherwise secured to the butt 9. The plate 14 and the disk 13 serve to prevent the butt 9, which is made of wood, from becoming ignited from the explosion of the charge of powder which propels the projectile from the gun.

Within the casing 1 and located between the butt 9 and the head 2 thereof is a charge 15, consisting of dynamite or other explosive. The said charge is cylindrical in form and is formed at its opposite ends by removable caps 16 17, the cap 16 at its forward end having a tubular nipple 18 formed thereon for the reception of a percussion cap or primer 19. The cap 17 at the rear end of the charge is formed with a central opening 20 for the passage of the fuse 12 to the interior of said charge, said fuse being provided at its inner end with a fuse-cap 21. Between the butt 9 and the rear end of the charge 15 are placed a disk 22 of rubber or other like electrical non-conducting material and a mass of padding 23, which constitute a buffer and prevent the accidental explosion of the charge by a shock exerted from the rear end of the shell. The disk 22 is perforated at its center for the passage of the fuse 12 and serves to prevent the accidental explosion of the charge by elec-

tricity, which may be induced by the passage of the shell through the gun. Surrounding the charge 15 are folds of padding 24, which are held in place by a strip 25 of sheet-rubber, the former serving to prevent the accidental explosion of the charge by impact or shock against the side of the casing and the latter serving to prevent the accidental explosion of the charge by electricity which may be induced. The padding 24 and the rubber strip 25, together with the charge and its envelop 15, are secured in place upon the butt 9 by means of a metallic disk 26, which is located at the forward end of the charge 15 and is provided with a central opening 27, through which the nipple 18 projects, and guy-wires extending from said disk and secured to pins 28 28 on the butt 9. Between the forward end of the charge 15, or rather between the disk 26 and the inner end of the head 2, is interposed a mass of suitable padding 29 for the same purpose as that heretofore referred to. When the parts are in place, as shown in Fig. 2 of the drawings, the percussion-primer 19 bears against the rear end of the plunger or firing-pin 4 and the parts are secured in place by means of screws extending through the casing 1 into the butt 9. The time-fuse 12 extends from the interior of the charge 15 out through an opening 30, which leads from the center of the forward end of the butt 9 to the groove or recess 11. It is then wound upon the butt 9 within said recess and extends through an opening 31 out of the rear end of the butt, leaving a projecting portion, as clearly shown.

When the shell is discharged from the gun from which it is fired, the fuse 12 is ignited at its projecting end, and when it has been completely burned the fuse-cap upon the rear end thereof is exploded. The charge is also adapted to be exploded by impact against the object toward which it is fired. The plunger 4 striking the object is forced inwardly, breaking the pin 6 and bringing its rear end in contact with the percussion-primer 19. The bullet from the latter being impelled against the dynamite or other explosive substance explodes the charge in a manner well understood. It will thus be observed that the shell may be exploded either by impact against the object sought to be destroyed or by a time-fuse, the length of which may be controlled. The manner of controlling the length of the fuse will be readily understood, it is thought, from the foregoing description. It may be stated, however, that by simply withdrawing the butt 9 and the parts connected thereto from the casing 1 the fuse may be cut off at the proper length and wound within the recess or groove 11 with but a short portion thereof projecting out from the rear end of the projectile.

It will be noted, further, that the danger of accidental explosion of the charge from shocks due to the propelling force within the gun from which it is fired will be reduced to a minimum and that similar accidental explosion due to electric currents generated by the passage of the shell from the gun will be effectually prevented.

It will be noted, still further, that when the parts are in their normal position the fuse is completely protected by the casing, except at the end thereof, which is intended to be ignited by the explosive charge of the gun. In this connection it may be stated that the opening 31 in the butt 9, through which the time-fuse 12 passes, should be of larger diameter than the fuse itself, so that the latter may slip readily therethrough, but may be sealed by cement, sealing-wax, or other like material.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a shell for high explosives, the combination of a hollow body or casing for the charge, a butt for closing the rear end of the casing, an explosive charge connected with the butt for convenient insertion to the casing, a padding of soft substance completely inclosing the charge, an envelop of rubber or other electrical non-conductor also inclosing the charge, and means, substantially as described, for igniting the charge.

2. In shells for high explosives, the combination of a hollow body or casing for the charge, a butt for closing the rear end of the casing, an explosive charge connected with the butt, a padding of soft substance entirely inclosing the charge, an electrical non-conducting substance enveloping the charge and the padding, a disk at the front end of the charge, and tie-rods outside the charge for coupling the charge and its covering with the butt, substantially as described.

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

CHARLES NUTEN CHAMBERS.

Witnesses:
ELIAS L. MORRIS,
A. G. SALMON.