

(No Model.)

W. KENNISH.
SHELL.

No. 333,955.

Patented Jan. 5, 1886.

Fig. 1.

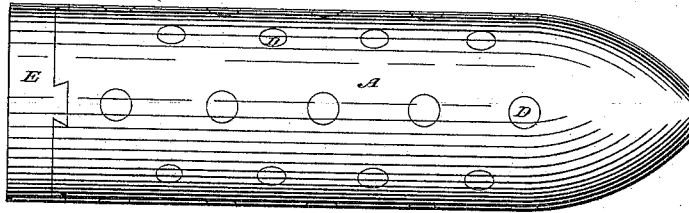


Fig. 2.

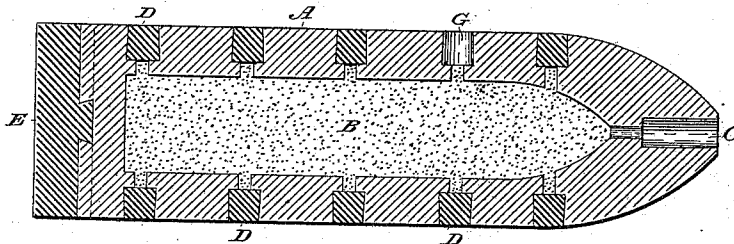


Fig. 3.

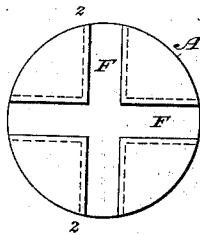


Fig. 4.

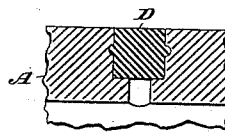


Fig. 5.

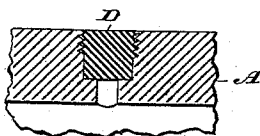
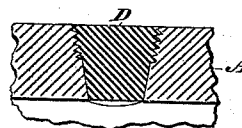


Fig. 6.



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SHELL.

SPECIFICATION forming part of Letters Patent No. 333,955, dated January 5, 1886.

Application filed May 25, 1885. Serial No. 166,564. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM KENNISH, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain
5 Improvements in Explosive Projectiles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of the specification.

10 My invention relates mainly to improvements in explosive projectiles for heavy guns and rifled ordnance; but I do not limit myself to any particular size and shape of the projectile.

15 My improvements are particularly adapted to elongated shells for rifled ordnance.

The first part of my invention consists in means that will be hereinafter described for compelling the fracture of the shell or projectile
20 into a great number of fragments of substantially uniform size at the moment of bursting, and the second part of my invention consists in providing the butt of an elongated projectile with a sabot of lead or other
25 soft metal, which sabot is attached to the projectile in a peculiar and novel manner.

In the drawings which serve to illustrate my invention, Figure 1 is a side elevation of an elongated percussion projectile provided with
30 my improvements. Fig. 2 is a longitudinal axial section of the same. Fig. 3 is an end view of the base of the projectile before the sabot is applied. Figs. 4, 5, and 6 illustrate slight modifications, that will be hereinafter
35 described.

A represents an elongated hollow conical projectile or shell, and B is the explosive charge in the cavity of same.

40 C is the cavity or bore in the tip of the projectile, to receive the ignitor and the bolt for effecting the ignition of the charge B by percussion.

So far as above described the projectile is of the usual construction. When such a projectile
45 is fired from a rifled gun, it rotates on its longitudinal axis with great velocity, and when it explodes the line or lines of fracture are very uncertain. The projectile may simply separate into two or three parts, and
50 these may be of very unequal size and weight.

One of the objects of my invention is to compel the body of the projectile—that is to say, the portion between its butt and tip—to break at the moment of explosion into numerous fragments of substantially equal size,
55 which will be driven in all directions simultaneously, thus combining the deadly effect of musketry with the long range of rifled artillery.

I will now describe the means I employ to
60 effect this. In the walls of the projectile are bored or otherwise formed perforations or recesses G, to receive plugs D D, which may be of any convenient size, and any number of
65 which may be used. The perforations for the plugs D should be distributed equally, or substantially so, and are counterbored, as shown, and open into the cavity of the projectile containing the charge B. These plugs D are
70 usually made from lead, and they are hammered tightly into the recesses, so as to fill the latter and make the outer surface of the projectile smooth and even, as shown.

In order that the centrifugal force imparted by the rotation of the projectile may not throw
75 out the plugs, I provide means for securing them in their seats. In Fig. 2 I have shown the walls of the perforations G undercut. When the leaden plugs are hammered forcibly
80 into these, their lower or inner ends are expanded and enlarged, so that the plugs cannot be expelled except by the exertion of considerable force. In Fig. 4 I have shown a retaining-groove formed in the wall of the perforation for the lead to expand into, and in Fig. 5
85 several convolutions of a screw-thread are shown formed in the wall of the perforation. I prefer to counterbore to form the perforations G for the plugs, as this forms a shoulder at the bottom of the plug-recess for the
90 plug to rest on and abut against in hammering it in; but I do not limit myself to this. In Fig. 6 I have shown the plug-recess made conical and extending entirely through the wall of the projectile. To prevent the plug
95 being thrown out by centrifugal force, the recess is screw-threaded, as shown. It will be obvious that these retaining devices for the plug may be constructed in various ways, and any method or construction equivalent to
100

those shown that will form a positive retaining device may be employed. I have shown one of the recesses G empty in Fig. 2, its plug D having been omitted only for purposes of illustration.

5 The projectile above described is, in reality, composed of two metals—that is, I take the ordinary projectile of iron or steel and perforate it at intervals in order to weaken it and determine lines of fracture between the perforations, and I then fill up these perforations with plugs of lead, thus leaving the projectile intact superficially and without openings or vents for the gases at the time of explosion.

10 At the same time I do not maintain that the insertion of the leaden plugs strengthens the projectile or alters the determination of the lines of fracture effected by the perforations. At the moment of explosion the body of the

20 projectile is broken into substantially uniform fragments, the number of which will depend on the number of recesses G, and to these fragments will be added, as destructive missiles, the plugs D. The positive retaining devices

25 of the plugs will insure the bursting of the projectile before they can be expelled.

I am aware that it has been proposed to provide a spherical shot with a small central powder-cavity, and to form bores extending from the surface into said cavity. Ordinary

30 bullets with patches are rammed into these bores, and when the shot is fired and the charge is ignited by a fuse these bullets are expelled in the manner of musket-balls. The

35 shot does not explode. In some cases, also, it has been proposed to provide such a shot with a second charge to explode the shot itself after the bullets have been expelled.

While my invention, as above described, is applicable to spherical shells or projectiles, yet I do not contemplate a discharge of the

40 plugs D as bullets from a gun, but rather employ them to close up the apertures and form missiles of the same nature as the fragments

45 of the shell-body. As they are positively retained in place, these plugs form in reality a part of the shell-body, though not integral parts.

E is the sabot of the projectile, which is

50 made from soft metal, usually lead, and is designed to be so expanded by the impact of the discharge as to take into the rifles of the gun and compel the projectile to rotate in the usual way. So far as I am aware, all such

55 sabots have had a ring-like attachment to the projectile. In some cases a sort of dovetail tenon of cylindrical or polygonal form is formed on the butt of the shell, and a leaden sabot fitted over this. I avoid these difficulties

60 by forming dovetail or undercut grooves

F F in and across the base or butt of the projectile, arranged to intersect, as shown in Fig. 3, and construct dovetails on the face of the sabot E, to take into and fit these grooves.

65 This may be done by casting the sabot on the projectile, when the molten lead will fill the grooves. With this construction the impact only tends to force the softer metal of the sabot more tightly into the grooves, while the metal of the body of the sabot expands into

70 the rifles of the gun. The sabot cannot rotate independently of the projectile A without first shearing off the dovetails on the face of the sabot. There is no ring to be cut or torn

75 by the rifles in the gun, as the rifles can only act on the solid metal of the sabot. At least two intersecting grooves, F, are required.

Having thus described my invention, I claim—

1. An explosive projectile provided with

80 recesses G, formed in and distributed over the surface of its body, and said recesses filled up to the level of the exterior surface of the projectile with plugs D, which plugs and recesses are respectively provided, as set forth, with

85 positive retaining devices, whereby the said plugs form substantially parts of the body of the projectile, and the recesses determine the fracture of the said body into numerous frag-

90 ments, as set forth.

2. An elongated hollow projectile for rifled ordnance, provided as follows, namely: with a sabot to engage the rifles in the gun, with

95 perforations G, formed in and distributed over its body, and such perforations provided with internal grooves or recesses to form retaining devices, and with leaden plugs D, fitted into said perforations and engaging said internal grooves or recesses, substantially as set forth.

3. A hollow explosive projectile provided

100 with numerous counterbored and screw-threaded perforations, G, formed in and distributed over its body at substantially equal distances apart, and with leaden plugs D, fitted tightly into said perforations G, and engaging the screw-threads in same, substantially

105 as set forth.

4. The combination, with the projectile A, provided with the undercut or dovetail intersecting grooves F, of the soft-metal sabot E,

110 provided with dovetails which engage the grooves F, substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing

115 witnesses.

WILLIAM KENNISH.

Witnesses:

HENRY CONNETT,
ARTHUR C. FRASER.