

Patented Aug. 14, 1917.

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1,236,736.

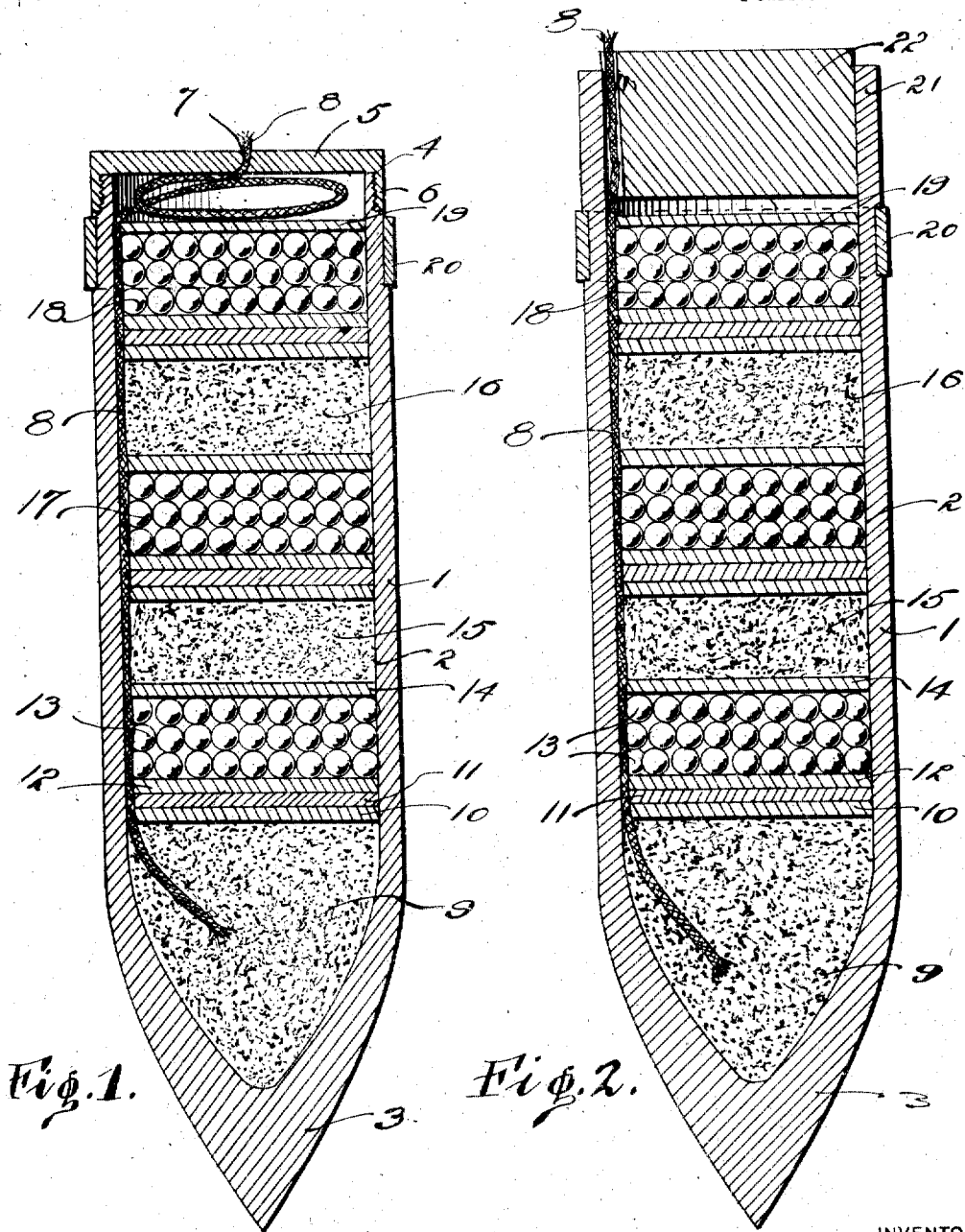


Fig. 1.

Fig. 2.

WITNESSES

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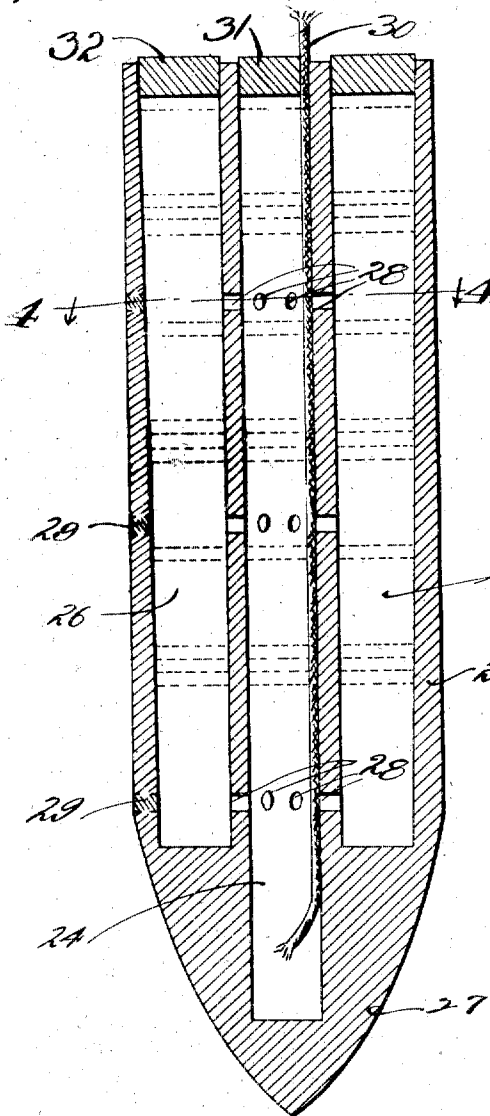


Fig. 3.

Fig. 4.

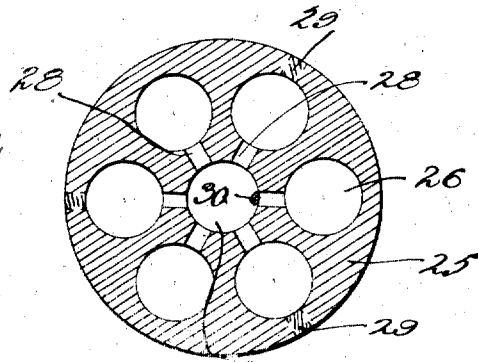
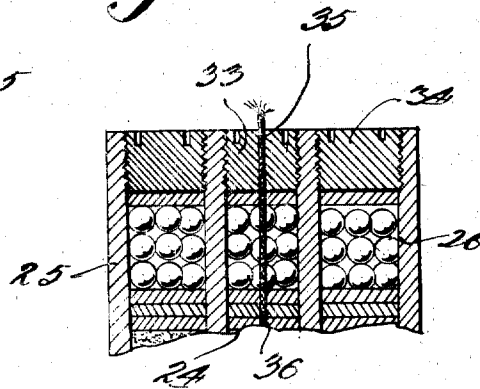


Fig. 5.



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EXPLOSIVE DEVICE.

1,236,736.

Specification of Letters Patent.

Patented Aug. 14, 1917.

Application filed March 17, 1916. Serial No. 84,873.

To all whom it may concern:

Be it known that I, THOMAS S. MILLER, a citizen of the United States, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented certain new and useful Improvements in Explosive Devices, of which the following is a specification.

An object of my invention is to provide an explosive device consisting of a shell or case having one or several elongated bores packed with alternately arranged charges of shot or slugs and explosives, together with a fuse to extend from the exterior of the shell or case to ignite the explosive charges inversely in the order in which they are packed within the bores to cause the charges of shot or slugs to be successively discharged from the shell, and which device is so constructed that it may be used in warfare as a projectile of the shrapnel type by being shot or otherwise projected over and beyond a fortification or other barrier after the fuse has been ignited and which will, after striking behind the fortification or barrier discharge the separate charges of shot or slugs successively backwardly or against the rear side of the fortification or barrier, or which may be planted in the earth in an inclined relation with the fuse ignited, when a retreat is to be made, thus arranging the device in such relation that the charges of shot or slugs will be successively discharged from the shell and directed against a person or a body of persons advancing toward the retreating parties.

A further object is to so construct and form the device that the various explosive charges will be fired in the proper intervals and succession, and that when a plurality of bores having the alternately arranged explosive and shot or slug charges therein is used, the charges in the several bores will be fired in the proper succession.

With the above and other objects in view, my invention consists in certain novel features of construction and combination of parts which will be hereinafter set forth in connection with the drawings and then more particularly pointed out in the claims.

In the drawings:—

Figure 1 is a view in longitudinal section showing one embodiment of my invention.

Fig. 2 is a view similar to Fig. 1 showing a slightly modified form of the device.

Fig. 3 is a longitudinal sectional view showing a varied form of the device.

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary sectional view of the inner end of a device similar to that disclosed in Fig. 3, certain of the parts being modified in form.

In the form of the device as shown in Figs. 1 and 2, the shell 1 has a central bore 2 made of sufficient size that the wall is reasonably thin, however it is not a primary object of the construction that the device shall burst when the explosive charges are ignited, and this wall is given sufficient strength to withstand the force of the various explosions causing the shot or slugs to be discharged from the shell. This shell or casing 1 is preferably made pointed at its outer end as at 3, and the inner end of the shell is cut straight across, and after the adaptation in Fig. 1, is turned down at its extreme end and made of slightly less diameter, this part of lesser diameter being provided with screw-threads as at 4, and a cap 5 being provided with internal screw-threads on the flange or rim 6 thereof to be received over the threads 4. By mounting the cap 5 as above stated, the inner end of the shell is closed and as the threads are made of fine gage, the force of the explosion in the shell, as will be hereinafter set forth more at length, will cause the cap to be displaced from the shell and will thus leave the inner end of the shell open.

The cap 5 is provided with a central bore 7 which is adapted to receive the fuse 8 which is passed therethrough, this opening 7 being preferably centrally disposed to permit cap 5 to be turned onto the screw-threads 4 and to prevent twisting of the fuse 8 during this operation. This fuse 8 is extended down into the bore 2 of the shell 1 and is preferably brought to bear against the side wall thereof, thus establishing a direct line through which the fire will be carried from the exterior of the shell with the cap in place, to the extreme innermost end of the bore 2 of the shell.

A charge of powder indicated at 9 is placed in the inner end of the bore 2 and suitable wads 10 and a proper packing indicated at 11, which packing might be clay or any other material which will establish a tight connection around the fuse 8 and

will stop all communication to the charge at 9 except through the fuse 8. A wad 12 is then placed over the packing layer 11 and a charge of shot or slugs 13 is loaded in the shell upon the wad 12, after which a wad 14 is inserted in the bore to cover the shot and another charge of powder or explosive mixture as indicated at 15 is placed on this wad 14 after which the wadding and packing is repeated. While any number of explosive charges and charges of shot or slugs might be placed in the shell, in the present instance I have shown three charges of powder indicated at 9, 15, and 16, and the shot or slug charges as indicated at 13, 17, and 18, are placed upon these explosive charges after the bore has been suitably wadded and packed to establish the proper fireproof joint or wall. The fuse 8 is made of sufficient length to extend well down into the body of the charge 9 which is the first charge to be placed in the bore 2, and thus it is assured that this charge will be ignited, and as the fuse extends directly through the explosive charges at 15 and 16, the spark from the fuse will cause the proper ignition and explosion of these charges. It will of course be understood that the length of the fuse 8 above the last layer of packing and wadding placed in the bore to cover the explosive charge 16 will be governed by the length of time it is desired to have elapse between the initial ignition of the fuse 8 and the firing of the charge 16, and if found advisable this fuse 8 might be made of a greater length than would be required to traverse the length of the bore 2 and the excess length will then be coiled on the wad 19 covering the last charge of shot or slugs, the cap 5 covering this coiled length of the fuse and protecting the same against the flame from the explosion of the firing charge when the device is used as a projectile to be discharged from a gun. The opening 7 is made of such a size that when the extreme outer end of the fuse 8 is pulled therethrough, a tight joint is established, and the wads 10 and 12 as placed over the powder and the wad 14 as placed above the shot are notched at one side to receive the fuse 8, the packing at 11 acting to establish a tight joint around the fuse and around the inner wall of the bore 2.

In making this device, the explosive charge 9 is inserted and the wad 10 is then placed in the bore 2 with the notched opening fitted around the fuse 8 which fuse is in a position of bearing against one side of the bore with the upper end extending through the open inner end of the shell, and this wad 10 is then tamped down against the powder after which the packing 11 which is, as has hereinbefore been stated, preferably of clay in a plastic state or of other plastic and fire resisting material is

placed over the wad 10 and is properly tamped, the wad 12 being then placed within the bore and brought to bear against the plastic material at 11 after which the shot or slugs 13 are placed in the bore and are covered by the wad 14, the process of filling being then repeated until the wad 19 has been put in place, and then the excess length of the fuse 8 is coiled within the shell 1 on top of this wad 19 and after the end of the fuse has been passed through the opening 7 through the cap 5, this cap is screwed onto the threads 4, thus closing the bore 2 at its inner end and completing the device.

In use, this device may be used as a projectile to be discharged from a gun, or otherwise thrown over and beyond a fortification, hill or other artificial or natural barrier, and to give the projectile proper initial movement, the gun may be loaded and fired in the usual way, the band 20 being mounted around the inner end of the shell 1 to cause the projectile to follow the rifling of the gun barrel. As the explosive charge of the gun is ignited, this flame will come in contact with the protruding end of the fuse 8 and will ignite the same, or this fuse might be given initial ignition before being placed in the gun, and then when the fuse has burned through the outer end of its length and has passed through the wad 19, the charge of shot or slugs at 18, and the wads and packing above the explosive charge at 16, the sparks from the burning fuse will ignite the explosive charge at 16 and in consequence this charge will be fired and will cause the wad and packing below the charge of shot or slugs at 18 to impel these shot or slugs backwardly through the rear end of the shell 1, blowing off the cap 5 by stripping the threads 4, after which the shot or slugs will spread. The fuse 8 continues to burn, through the shot charge at 17 and through the wads and packing above the explosive charge at 15 and then when the sparks ignite the explosive charge 15, the shot charge at 17 will be fired back through the open end of the shell 1, and this same action will continue until the last charge in the shell, or the explosive charge first placed therein in the filling operation has been ignited. When this device is to be fired as a projectile from a gun, it will be shot beyond the lines in which the shot or slugs are to take effect and then as the fuse 8 burns down into the explosive charges of the shell, the shot or slugs will be discharged back to burst into the lines concealed behind the fortification or barrier from the rear, and if desired the bore 2 might be made tapered to be of larger diameter at its open end than at the end in proximity to the point 3 of the projectile so that the shot or slugs will be scattered over a wider range, and as the shell is carried forward with the pointed end 3 foremost and

in falling describes a gradual arc, this end 3 will penetrate the ground and will hold the shell inclined upwardly and backwardly in the direction from which it came so that the discharge of the shot or slugs will be in the proper line to strike a person or persons concealed behind the barrier over which the projectile has been fired, also if deemed desirable, the explosive charge at 9 might be made sufficiently heavy to give a stronger explosion which would burst the shell 1 while at the same time discharging the shot charge at 13, and in this way the shell 1 is made to serve not only as a container for the shot and explosive charges, but also will be thrown in fragments and splinters in every direction when the final bursting occurs. The device might also be used by a retreating army by being planted in the ground from which the retreat is to be made in a position of upward and forward inclination and then the fuse 8 can be lighted and when the fuse has burned to ignite the explosive charges in the shell, the shot charges will be discharged therefrom, and thus the successive charges will be fired at an advancing person or line of persons while the party who has ignited the fuse is retreating in the opposite direction.

In the form of the device shown in Fig. 2, the parts are substantially identical with the exception of the fact that the inner end of the shell or case 1 is extended to have slightly greater length beyond the mounting of the wad 19 and this extended portion as indicated at 21, is made of uniform thickness and left smooth both on its exterior surface and in the internal bore. The fuse 8 is brought up against the inner wall of the bore 2 of the shell to extend through the open end and a wood plug 22 having a groove formed along one side thereof is fitted in the open end of the shell with the fuse 8 received in the groove 23 and then this plug 22 is forced into the open end of the shell to close the same, and gives elasticity to establish a tight connection around the fuse 8. This form of the device will be loaded and will operate in the same manner as hereinbefore set forth.

In the form of the device shown in Figs. 3, 4, and 5, a central bore 24, of relatively small size is provided in the shell or casing 25 and the bores 26 are formed to extend from the inner end of the shell 25 inwardly therein to a point adjacent the pointed end 27, these bores 26 being preferably concentrically arranged around the bore 24. As shown in Fig. 3, the bore 24 is preferably cylindrical and the bores 26 are tapered to spread from their inner ends outwardly.

It is preferable that an equal number of bores 26 be spaced around the central bore 24 and counterbores are formed through the shell or casing 25 to pass diametrically there-

into through the walls separating the bores 26 from the bore 24, thus establishing spark leads 28 from the central bore 24 to each of the peripherally arranged bores 26. As illustrated in Fig. 3, it is preferable that these counterbores be provided at several points along the length of the shell 25 so that the fire leads 28 will be provided in line with the points where the explosive charges are filled into the several bores. As has been stated, these bores forming the fire or spark leads 28 are started from the exterior of the shell and the openings through the outer walls are closed by the screw-threaded plugs 29, or in any other suitable manner. In loading the shell, the fuse 30 is placed in the central bore 24 to extend down along the side wall thereof and the explosive charges, the wads and packing, and the shot or slug charges are filled into the bores 24 and 26 in the manner described in connection with the form of the device shown in Fig. 1, it of course being understood that the explosive charges are placed in the same relative arrangement in the various bores and are so positioned that the fire or spark leads 28 will establish communication from the central bore 24 in those portions in which the explosive charges are packed to the same relative portion of each of the bores 26. Plugs 31 and 32 are fitted in the open ends of the bore 24 and the bores 26, it of course being understood that the plug 31 is grooved to receive the fuse 30, and thus the open ends of these several bores are closed to permit the device to be fitted in a gun and discharged as a projectile therefrom. As the fuse 30 burns down to ignite the first charge of powder or other explosive in the central bore 24, this charge is exploded to drive the shot or slug charge and the plug 21 from this bore and at the same time, the fire flashes through the fire or spark leads 28 to ignite the explosive charges in the several peripherally arranged bores 26. As the bore 24 is straight, the shot charge is discharged through the open end thereof without any considerable scattering action, and by reason of the fact that the bores 26 are tapered, the shot charges projected therethrough will be spread to cover a considerable area, also, if desired, the explosive charges in the various bores can be varied to cause the shot charges to be carried to greater or lesser distances as desired, and in this way the device will be constructed to still further scatter the shot as discharged therefrom. As the plugs 29 are set rigidly in the metal of the casing or shell 25, these plugs will not be readily blown out and the shell will present each of the bores thereof as a continuous and unbroken path for the discharge of each successive charge of shot or slugs, however, if desired, the extreme inner end of the bore 24 may be loaded with a charge of a high explosive which will

burst the shell and throw the same in fragments.

In Fig. 5, the structure is identical with that disclosed in Figs. 3 and 4, and here the open ends of the bores 24 and 26 are internally screw-threaded, the plugs 33 and 34 being screw-threaded to be received in these screw-threaded open ends to close the same. The plug 33 received in the open end of the bore 24 has a central orifice or passage 35 therethrough and a fuse 36 is received through this passage, it being preferable that this fuse 36 be extended down into the bore 24 centrally thereof, and the passage 35 being centrally bored in the plug so that as the plug is turned into the screw-threaded end of the bore 24, this fuse will not be twisted. The screw-threads of both the bores and the plugs will necessarily be of reasonably fine pitch and thus as the first charge is fired, these plugs will be blown out and at the same time the shot or slug charges will be fired from the device.

While I have herein shown and described only specific forms of my invention, it will be understood that the caps or plugs closing the ends of bores might be varied in their form and mounting as well as in the material from which the same are constructed, that various other packing materials than those mentioned might be used, that any number of bores can be formed in the shell or casing, and that various other changes and modifications might be resorted to without departing from the spirit and scope of my invention, and hence I do not wish to be limited to the exact construction above set forth, but only to such points as may be set forth in the claims.

I claim:—

1. An explosive device of the projectile type comprising a shell solid at the head end and having a bore extending thereinto from the rear end, a fuse extending substantially throughout the length of the bore and from the rear end of the shell, charges of an explosive and of shot alternately arranged in said bore, and means to close the end of the bore and leave an end of the fuse exposed.
2. An explosive device comprising a cas-

ing having a plurality of bores disposed longitudinally in parallel alinement, spark leads provided at spaced apart points throughout the length of said bores to establish communication between the several bores, a fuse extended throughout the length of one of said bores, explosive charges mounted in said bores at points corresponding to the location of the spark leads, and shot charges mounted in alternate arrangement with said explosive charges.

3. An explosive device comprising a casing having a central bore, a plurality of bores arranged in concentric positioning around the central bore, spark leads from central bore to the concentrically arranged bores formed at spaced apart points throughout the lengths of the bores, a fuse mounted in the central bore to extend throughout the length thereof, a plurality of explosive charges mounted in the bores in line with the spark leads, shot charges mounted in alternate arrangement with the explosive charges, and means to close the open ends of the bores and to leave the fuse end projecting from the shell.

4. An explosive device of the projectile type comprising a casing having a solid head with a central bore at the rear end and a plurality of bores grouped concentrically around the central bore, spark leads from the central bore to the concentrically arranged bores formed at spaced points throughout the lengths of said bores, a fuse mounted in the central bore to extend throughout the length thereof, alternately arranged shot and explosive charges loaded into the several bores in such a relation that the explosive charges are in line with the spark leads, means to close the ends of the concentrically arranged bores, and means to close the open end of the central bore and leave the fuse end projecting from the shell.

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

THOMAS S. MILLER.

Witnesses:

W. T. WILSON,
GWENDOLIN McCANCE.