May 8, 1945. D. J. CAMPBELL 2,375,522

ARTILLERY BOMB

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Fig. 1.

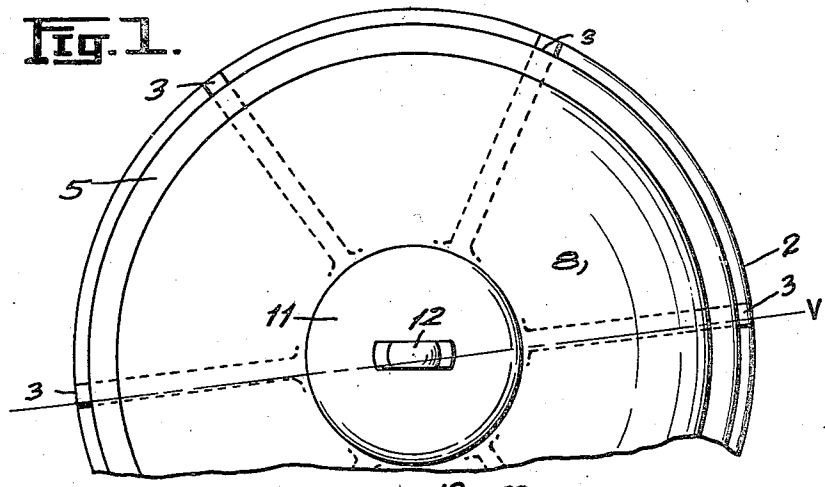


Fig. 2.

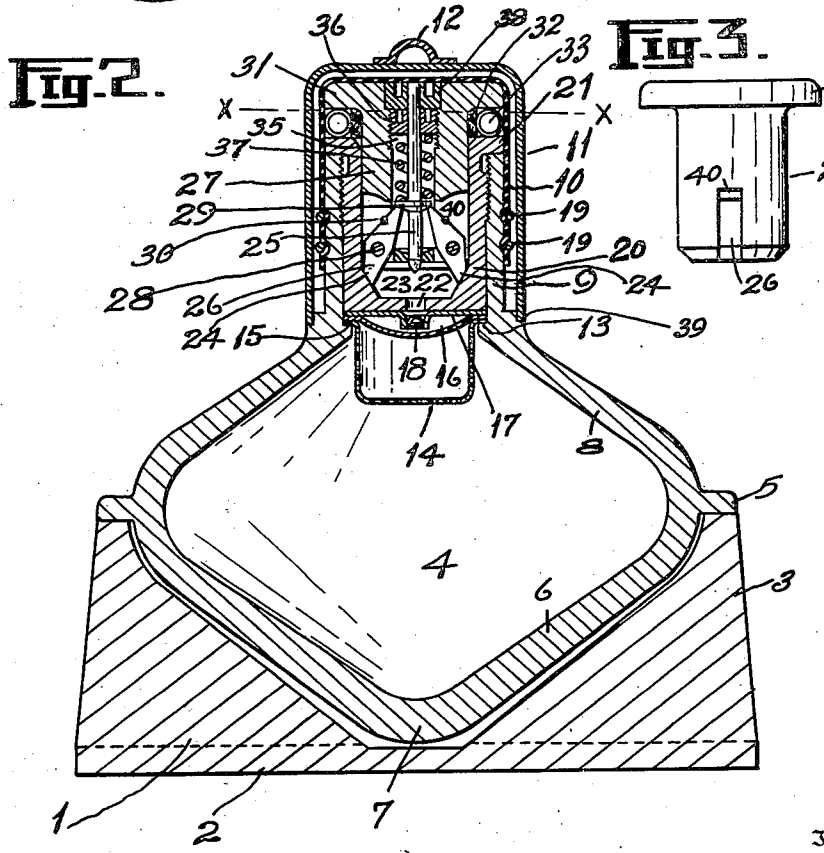


Fig. 3.

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Fig. 4.

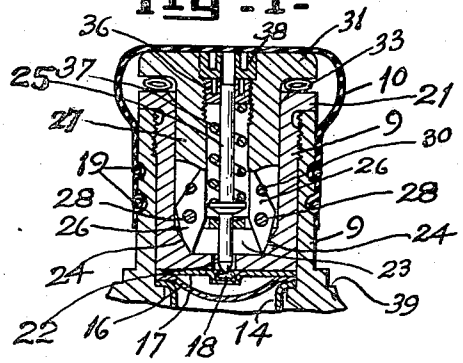


Fig. 5.

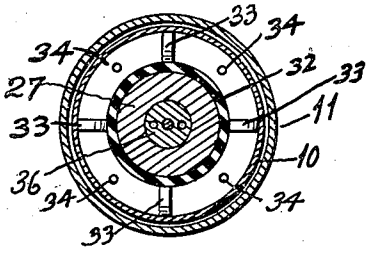


Fig. 8.

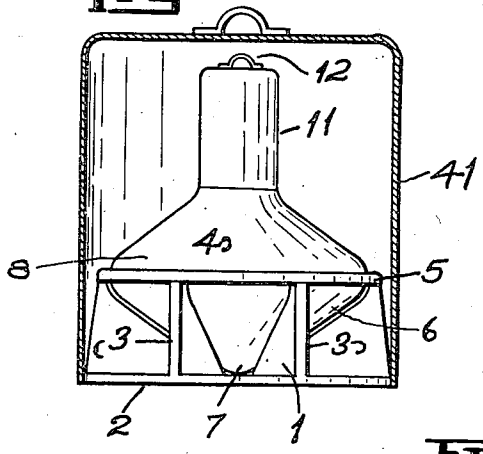


Fig. 6.

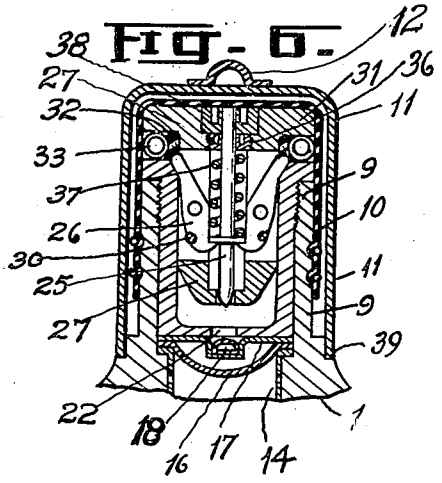
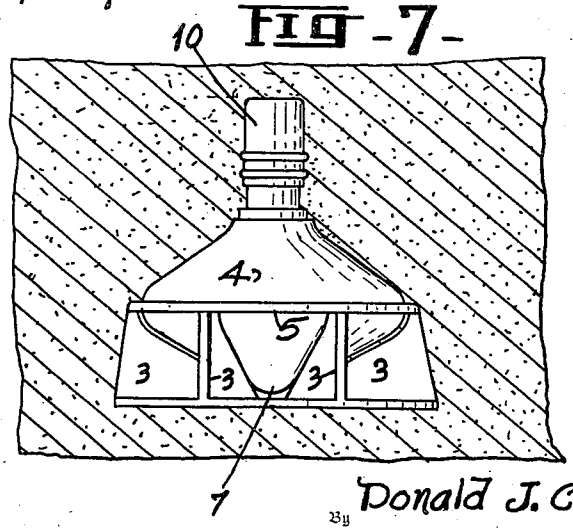


Fig. 7.



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2,375,522

ARTILLERY BOMB

Donald J. Campbell, Spring Lake, Mich.

Application August 3, 1940, Serial No. 350,655

2 Claims. (Cl. 102—8)

My present invention relates to improvements in artillery bombs, and particularly to land bombs or mines and their placement, whereof a large plurality of such bombs are planted throughout a territorial area in the path of army troops, army tanks, cars, trucks and the like; and the objects of improvement are, first, to provide a bomb of the kind named that can be produced cheaply; second, to provide a bomb of which the parts will be interchangeable, thereby providing for quick replacement of parts, or repairs; third, to provide a bomb of simple construction; fourth, to provide a bomb that will require a minimum of machining in its production; fifth, to provide a bomb that can be planted in placements previously planted and prepared, thus requiring a minimum number of bombs to be produced and transported; sixth, to produce a bomb that can be planted with great rapidity; and seventh, to provide a bomb that will exert its greatest explosive force above the horizontal.

These named objects and other objects that appear from a perusal of the following description, when said description is in connection with the accompanying drawings, are attained by the structure disclosed, showing my preferred bomb structure, of which:

Figure 1 is a top plan view of my bomb structure, including placement or supporting base that is planted some time previous to the planting of the bomb therein. The view is so broken away to provide room on the sheet for a correspondingly large view of Figure 2.

Figure 2 is a vertical sectional view of my bomb taken on a plane extending downward from line V of Fig. 1, the view showing the several parts of the bomb in their relative positions.

Figure 3 is an elevation view of the detonator cage of my bomb, removed from the bomb in order that the slots in the cage with the firing pin release dogs therein may be shown more clearly than in the views showing the whole assembly.

Figure 4 is a vertical cross-sectional view of the upper portion of my bomb, in which the detonator and firing mechanism are housed. The view is taken on a plane extending downward from line V of Figure 1, and shows the firing pin as having discharged the detonator cap, and the rings or pins that support the detonator cage in its elevated position as shown in Fig. 1, squashed as by the passage of a heavy vehicle.

Figure 5 is a cross-sectional view taken horizontally through the upper portion of my bomb on a plane looking downward from line X of Fig. 2, the said portion including the portion enclosing the detonating mechanism.

Figure 6 is a vertical sectional view showing a modified structure of my bomb, wherein the firing pin release dogs are arranged at the upper end of the firing pin and detonator cage.

Figure 7 is a view illustrating my bomb as planted and in readiness to be discharged by the passage of a vehicle over it.

Figure 8 is a cross-sectional view of my bomb placement, including the bomb and the cap-like shield that protects the placement and keeps it in readiness for receiving the bomb at about the time it is to be used, the placement without the bomb having been planted some time previous to the planting of the bomb and at which time the shield is withdrawn, the bomb placed and the earth tamped around and covering it.

Throughout the views of the accompanying drawings, similar numerals refer to similar parts or portions of my bomb structure, and referring thereto:

Numeral 1 designates the supporting base of the bomb comprising ground plate 2 having a plurality of upwardly extending rib members 3, shaped roughly to conform with the exterior of the lower portion of the bomb 4, having extending outwardly from its larger diameter annular flange 5 resting on the tops of rib members 3 and supporting the bomb thereby. The wall of the lower portion 6 is thickest from the juncture of annular flange 5 to its lower extremity 7 and forms a cone having its smaller diameter below the said flange. The upper portion comprises a conic portion of the bomb, having its base at the said annular flange 5 and tapering inward with its wall 8 gradually diminishing in thickness from the said flange 5 to its juncture with cylindrical upwardly extending sleeve 9 surrounded by elastic inverted protecting cap 10, surrounding which and in spaced apart relation thereto is removable metal protecting cap 11 having at its top, loop handle 12 for removing the protecting cap 11 when the bomb is planted. The upwardly extending sleeve 9 has at the lower extremity of its bore, annular shoulder 13 upon which rests the secondary powder priming receptacle 14 having a plurality of small perforations extending through its walls and flange 15 engaging the shoulder 13 and engaging the circumferential edge of first powder receptacle 16 of very thin gage metal, or metal that is easily ruptured, having resting on the peripheral edge thereof, supporting flange 17 for the detonator primer 18. Supported by the top surface of the upwardly extending sleeve 9 having the elastic

inverted cap 10 secured thereto by wire binders 19, is detonator mechanism housing 20 having supporting flange 21, and at the lower end of its bore, firing pin passage hole 22 and inverted conic portion 23 having an inclined wall 24 with firing pin 25 extending therein and having a collar intermediate its ends engaged by the firing pin release dogs 26 pivoted in detonator cage 27 on pivot pins 28 and forced in engagement with the firing pin collar 29 by ring-spring 30 hooked onto each of the dogs engaging the conic portion of the cage's bore, and which cage 27 has at its upper end outwardly extending annular flange 31, having between it and the top of detonator mechanism housing 20, sponge rubber, or like annular packing ring 32 and collapsible metal rings 33, and pins 34. The cage 27 has extending axially downward from its top, hole 35 screw threaded at its upper end to receive nut 36 which forms an abutment for the firing pin spring 37, and at the opposite side of the nut 36, collar 38 having extending over its top and around the upwardly extending sleeve 9, elastic cap 10 surrounded by protecting cap 11 resting on the annular shoulder 39 at the juncture of the wall 8 and the sleeve 9. Slots 40 provide suitable recesses in the cage 27 for mounting the dogs 26.

Surrounding the supporting base 1 of the bomb is inverted deep dish-like shield 41, which is preferably placed in the cavity in the earth at the time the supporting base is set or planted, and withdrawn at the time the bomb is planted, as is also the protecting cap 11. Figure 8 shows both the shield 41 and the cap 11 in place on the bomb, as supported in readiness to be planted, at which time the shield 41 and cap 11 are withdrawn, the shield being replaced when the bomb has been removed, and it is desired to plant the bomb at a future required time.

Figure 6 illustrates the detonating mechanism arranged for release of the firing pin 25 by the release dogs engaging upper annular taper at the top of the detonator mechanism housing.

In the use of my improved bomb, holes of sufficient size and form are made in the earth in the path of moving army troops, tanks, cars, trucks and the like, which it is desired to destroy. The supporting base 1, together with the shield 41, is placed within the hole and the earth soil tamped securely around the shield and base. At the time it is desired to plant the bomb, the shield 41 is withdrawn, and the bomb placed within the cavity or hole and onto the base; the protecting cap 11 is then removed from the bomb and the earth soil is loosely packed around the bomb and over its top to a depth that will hide the bomb. The bomb is then ready to be exploded by pressure exerted on the top of the cage 27 by the covering of the soil on the cage, which pressure moves the cage downward, collapsing the rings 33 or pins 34. The downward movement of the cage carries the firing pin release dogs downward on the conic portion surface, thereby swinging the upper end of the release dogs from under the firing pin collar 29, thereby releasing the firing pin and allowing it to be driven forcibly against the detonator cap, thereby igniting charge of priming powder within the priming powder receptacle 16, which ruptures the receptacle and thereby ignites the second charge of priming powder within the second priming receptacle 14 and tears the receptacles from their engagement with the shoulder 13 of the bomb body; or by the flame and heat of the burning priming charge projected through the perforations through the sides and bottom of the second receptacle, ignites the high explosive charge within the bomb housing or body, which charge of high explosive may be of any one of the several explosives employed in bombs of the kind.

When a field has been selected to be planted with bombs, an excavation is made of somewhat deeper depth than the combined height of the base 1 and the bomb so that when the bomb has been planted there can be a quantity of earth over its top sufficient to hide traces of the bomb and to support the passage of a predetermined weight, and the bottom of the excavation leveled and tamped down to a sufficient hardness and support that will prevent tipping of the base 1 of the bomb by the passage of lighter artillery or tilting the axis of the bomb out of its vertical position, and should it be desired to plant the bomb immediately upon completion of the excavation, the base 1 is placed within the excavation and the bomb placed with its annular flange resting on the top portions of the base, loose earth is then packed snugly around the bomb and over its top with sufficient hardness to sustain the passage of such military portions as may be desired without detonating the bomb, but not sufficiently hard to prevent its detonation by such heavier portions it is desired to destroy, such portions including tanks and heavy artillery pieces, and should it be desired to plant the bomb in the rear of an army retreating, the excavations are made complete as described, but should it be desired to plant the bombs in the path of a retreating army or in a field on which fighting is expected to take place, the base only of the bomb is planted as described with the inverted dish-like shield 41 placed in the excavation over the supporting base of the bomb and the earth then packed around and over the shield with sufficient hardness to protect the excavation and prevent detection, and when the retreating army has passed over the excavation, the shield is withdrawn and the bomb placed on the base in the excavation, and the earth then packed around the bomb with sufficient hardness to support the lighter artillery pieces but not the heavier pieces as described, thus it will be seen, a field can be planted with the bombs complete, or only the base and shield can be planted in advance of a moving army and when the army has passed over the field, the shields 41 can be quickly withdrawn and the bomb planted, and that less bombs are required to be produced or transported, and while there can be no specific pattern of formation for planting the bomb throughout a field, the preferred pattern is a staggered one so there can be no direct path unprotected by bombs through which a tank or other heavy piece of artillery or transport could pass without discharging one or more bombs, the spacing of the bombs forming diamond-like formation.

Having described my improved bomb and the method of planting it, the rights which I desire to secure are set forth in the claims hereafter enumerated.

I claim:

1. In a bomb having a hollow body adapted to hold a charge of high explosive, the said body having an integral sleeve extending upwardly therefrom at the top thereof; a detonator housing in the said sleeve; a detonator cage slidable in the said detonator housing and having an axially extending bore and an outwardly extending annular flange at its top; a collapsible member between the said flange and the detonator housing for supporting the said cage and housing in

spaced apart relation to each other; a firing pin movable of and within the bore of the said cage; a spring engaging the firing pin for causing the firing pin to strike a detonator and releasing means operable by movement of the cage relative to the housing for releasing the firing pin for actuation by the spring.

2. The combination, in a bomb having a hollow cast metal body with a hollow boss extending upward from the body, a detonator housing secured in the said boss, a cage slidable in said detonator housing and having a firing pin slidable in the detonator cage and having a flange extending over the detonator housing with deformable members between the said flange and detonator housing and an elastic cap extending over and secured to the said hollow boss and enclosing the detonator housing and cage.

DONALD J. CAMPBELL.