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ANTIPERSONNEL MINE

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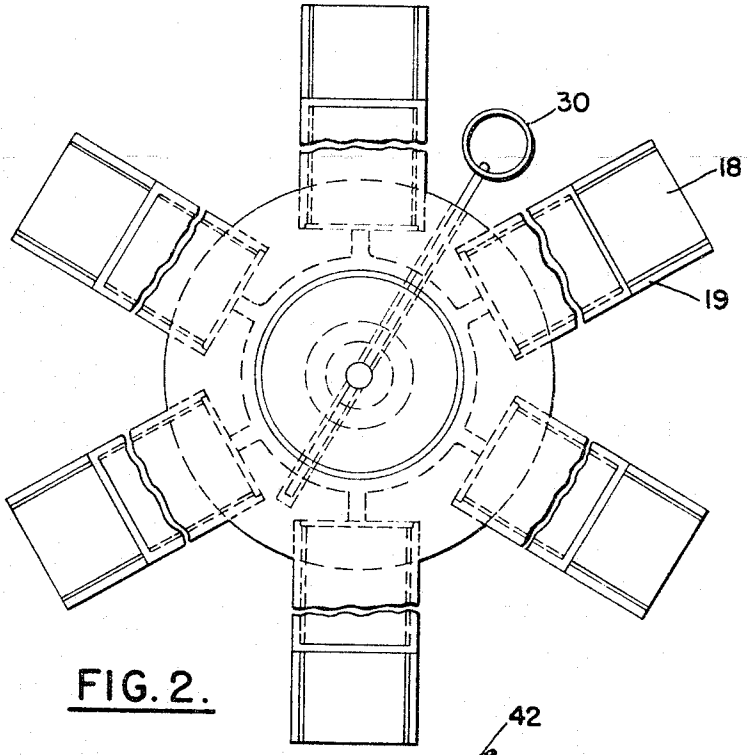


FIG. 2.

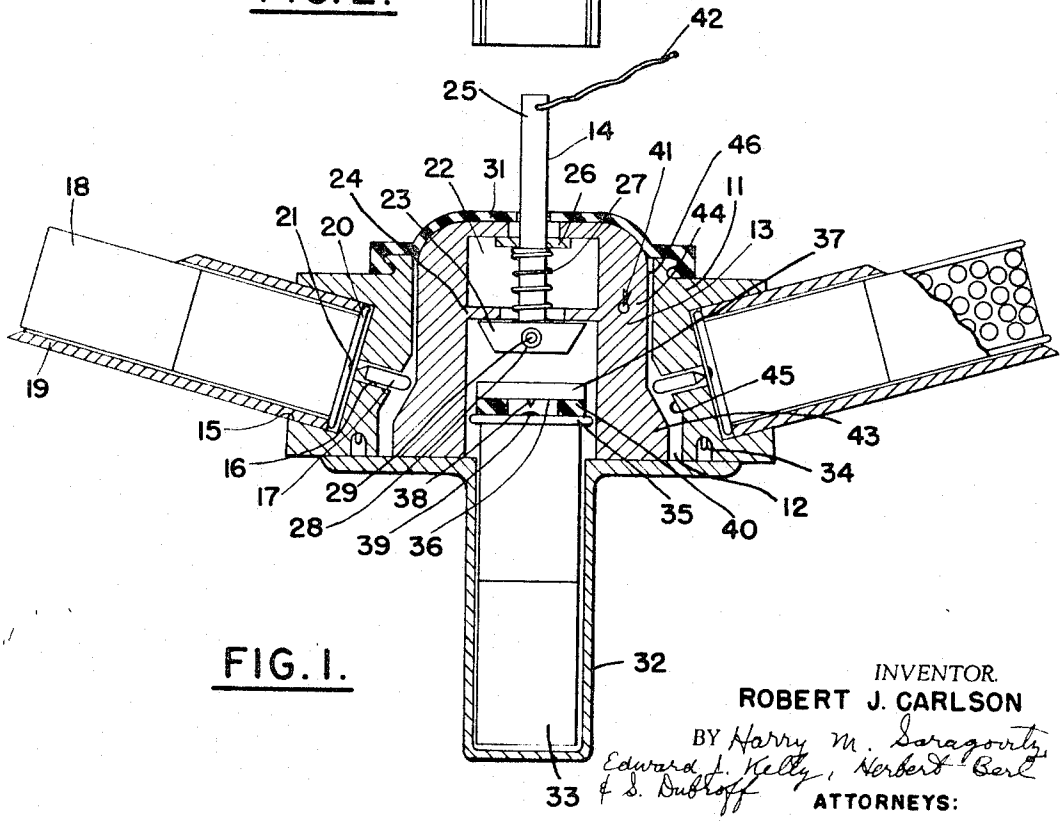


FIG. 1.

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ANTIPERSONNEL MINE

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4 Claims. (Cl. 102—8)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to an antipersonnel mine.

Heretofore, a conventional antipersonnel mine was generally characterized by a heavy metal container of bursting charge which was detonated by a percussion device actuated when the mine was trod upon. The effectiveness of an antipersonnel mine is determined by the amount of damage it can do in a certain area. This area has been defined as having an effective casualty radius which is that radius within which 50% of all personnel will become casualties. This effective casualty area was unpredictable with the prior art mine. The reason for this was that the prior art mine depended for its lethality upon the fragmentation of its metal container, the fragments of which were non-uniform in weight and shape and necessarily scattered in random patterns because of their obvious poor ballistic characteristics. As a result of this there was little assurance that the fragments would be directed as desired.

The prior art personnel mine also had the disadvantages of being bulky, heavy and dangerous when carried in transit. As a result it could not be conveniently carried on the person of combat troops, especially those involved in guerrilla type action where freedom from bulk is necessary for the desirable ease of movement under the conditions indigenous to that type of action.

Along with the aforementioned disadvantages the prior art mine was also complicated in structure and expensive to manufacture, as well as having limited storage life.

It is, therefore, an object of the present invention to provide an antipersonnel mine, which upon detonation has a uniform casualty area, thus a highly effective one.

It is a further object of this invention to provide an antipersonnel mine which is explosively inert during transit.

It is also an object of this invention to provide an antipersonnel mine which can use standard type shotgun shells as its destructive medium eliminating the need for dependence upon the fragmentation of a metal casing therefor.

It is still an object of this invention to provide an antipersonnel mine which uses simplified plastic-like parts of low-cost, compact and lightweight construction.

In accordance with the invention, the antipersonnel mine is provided with a main body having a plurality of equiangularly spaced radial bores therein which accommodate standard 10 or 12 gauge shotgun shells. The main body also has an axial bore therethrough wherein is placed a housing for the triggering mechanism of the mine. This housing is in axial slidable relationship with the inner surface of the main body axial bore. A flexible rubber-like cover is placed over the axial bore of the main housing and the triggering mechanism housing. The cover is provided with an opening which is coaxial with the main body axial bore. The triggering mechanism is deposed in a bore through the housing and coaxial with the main body bore. A stem extends from the triggering mechanism through the opening in the cover. A conventional gas generating small caliber cartridge is positioned by suitable means in firing alignment with the triggering mechanism. Firing pins are provided in each of the radial bores in the main body for firing the shotgun shells. When the mine of this invention is intended to be used shotgun shells are placed in the main body radial bores and the gas generating cartridge placed on the lower end of the triggering mechanism. Safety pins hold the triggering mechanism and its housing from movement. These pins are removed and the mine buried in the earth to a suitable depth. A lanyard or the like is secured to the triggering mechanism stem and another object. When a predetermined pressure is exerted on the triggering mechanism stem through the lanyard the triggering mechanism actuates, firing the gas generating cartridge. This causes the triggering mechanism housing to move axially upwards. The triggering mechanism housing and the axial bore are shaped to provide a camming relationship between the triggering mechanism housing and the firing pins for the shotgun shells. Therefore, when the triggering mechanism housing moves upwards the result is a movement of the firing pins and a firing of the shotgun shells. The typical uniform shot pattern of a shotgun shell results from each shell. With shotgun shells equiangularly spaced around the periphery of the main body a predictable 360° effective casualty area can be provided. Since the parts comprising this invention are light, compact, and explosively inert they may be readily carried by a combat troop without major deterrence to his movement. The use of conventional shotgun shells allows the mine itself to be stored indefinitely.

The invention will, however, be further understood from the following description when considered in connection with the accompanying drawings, and its scope is pointed out in the appended claims.

In the drawings:

FIG. 1 is a view in elevation and partly in cross section of an antipersonnel mine embodying the invention; and

FIG. 2 is a top view of the mine of FIG. 1 showing further details of construction.

Referring to the drawings, in which like reference characters refer to like parts throughout the figures, reference character **11** designates a main body, generally cylindrically shaped and formed with an axial bore **12** therethrough in which is carried a slidable inner housing **13** containing a triggering mechanism **14**.

The main body **11** contains a plurality of equiangularly peripherally spaced bores **15** each having its axis at the same angle relative to a horizontal plane and measured from a common point on the axis of the main body **11**. In this embodiment the main body **11** contains six bores **15** having their axes spaced 60° apart as viewed from the top as shown in FIG. 2. The bores **15** constrict to coaxial bores **16** of smaller diameter for the reception of firing pins **17** each having an end projecting a fixed distance into the axial bore **12** provided in the main body **11**. Commonly used 10 or 12 gauge shotgun shells **18** containing buckshot or large sized shot, such as No. 1 or No. 2 size, are inserted into open-ended tubular-like guides **19** having outside diameters substantially the same as the bore **15** diameters. The guides **19** have inside diameters substantially the same as the outside diameters of the shotgun shells **18** used, and have one end adapted to receive the flange end **20** of the shell **18** so that the flange **20** and guide **19** wall registers to form a substantially flat continuous surface. When the mine is intended to be used the combinations of shells **18** in guides **19** are inserted into the bores **15** with the flange ends **20** of the shells **18** in abutment with the lower end of the bores **15**. In this relationship the primers **21** of the shells **18** are in substantial axial alignment with the firing pins **17**.

The inner housing **13** is formed with an axial bore **22** therethrough which contains the triggering mechanism

14 for the mine. The triggering mechanism 14 comprises a hammer 23 which is positioned against an abutment 24 integrally formed on and disposed substantially centrally within the bore 22 of the housing 13. A stem 25 integrally formed on the hammer 23 extends upwardly through the bore 22 of the housing 13. The bore 22 constricts to a smaller diameter at the upper end of the housing 13. A circular disc washer 26 or the like having a diameter larger than the constricted opening of the bore 22 is fixed to the stem 25 and arranged thereon between the constricted opening and the abutment 24. Interposed between the washer 26 and the hammer 23 and surrounding the stem 25 is a compression helical spring 27 urging the triggering mechanism 14 downwardly. The triggering mechanism 14 is prevented from moving downwardly by a hollow shear pin 28 in the hammer 23 frangibly secured to the housing 13. A metal safety pin 29 passes through the shear pin 28 through registering radial openings in the housing 13 and the main body 11 and terminates in a ring 30 or the like as shown in FIG. 2, aiding withdrawal thereof prior to intended use of the mine 10.

The upper end of the main body 11 is adapted with a flange for receiving a flexible rubber-like cover 31 having an opening coaxial with the bore 22 through which passes the stem 25 of the triggering mechanism 14. As shown in FIG. 1 the cover 31 is in substantially abutting relationship with the upper end of the housing 13.

A container 32 formed to receive a gas generating cartridge 33 is fixed to the lower end of the main body 11 by means of pins 34 or the like. When the container 32 with the cartridge 33 therein is fixed to the main body 11 the cartridge 33 is substantially coaxial with the bore 22 of the housing 13 and the flange end 35 of the cartridge 33 extends a short distance into the bore 22 as shown in FIG. 1. A saddle-like firing pin assembly 36 is fixed to the flange end 35 of the cartridge 33 by suitable means, such as an adhesive. The firing pin assembly 36 comprises a rigid disk 37 having a firing pin 38 integral therewith and centrally disposed in alignment with the primer 39 of the cartridge 33. Interposed between the disk 37 and the flange 35 of the cartridge 33 and comprising part of the firing pin assembly 36 is a flexible gasket 40 made of rubber or the like and fixed to the lower surface of the disc 36. Suitable means, such as an adhesive, is placed between the gasket 40 and the surface of the flange 36 to secure the firing pin assembly 36 thereto.

As an added safety measure for preventing premature firing of the mine 10 a retaining pin 41 passes through an opening in the housing 13 which is in registration with an opening in the main body 11.

When the mine 10 is intended to be used the shotgun shell 18-guide 19 combinations are inserted into the bores 15 and the container 32 and cartridge 33 with the firing assembly 36 fixed thereto are put on the main body 11. The safety pin 29 and retainer pin 41 are then removed and the mine 10 embedded in the earth's surface to a depth whereby enough of the stem 25 is above the surface so that one end of a lanyard 42 or the like may be attached to the stem 25 and the other end attached to another embedded mine, tree, stake or the like. When pressure is exerted on the lanyard 42 either in a horizontal or vertical plane this pressure will be transmitted through the stem 24 to the shear pin 28 fracturing same. The compression spring 27 then drives the triggering mechanism 14 downwardly resulting in impact of the hammer 23 with the firing pin assembly 35 driving the firing pin 38 into the primer 39 of the gas generating cartridge 33 with ultimate firing thereof. The expanding gases will cause the cartridge 33 to move upwardly to communicate with the hammer 23 and abutment 24 thereby urging the housing 13 upwardly. The flexible cover 31 will permit upward movement of the housing 13. As shown in FIG. 1 and as heretofore described the ends of the firing pins 17 have an end projecting into

the bore 12. The lower end portion 43 of the housing 13 is substantially a truncated shape wider than its upper end portion 44. The lower end portion 45 of the bore 15 of the main body 11 has a truncated shape displaying a wider diameter than the upper end portion 46 thereof. The lower end portion 43 of the housing 13 and the lower end portion of the main body 11 are substantially complementary in shape to each other whereby the upward movement of the housing 13 will result in a camming by the surface of the lower end portion 43 of the firing pins 17 and axial movement thereof in the bore 16 and finally impingement of the primers 21 of the shells 18 and their substantially simultaneous detonation. The shells 18 will display their normal cones of shot dispersion providing a uniform pattern of shot 360° around the mine.

I claim:

1. In an antipersonnel mine having a substantially cylindrical main body, said body having

a plurality of equiangularly spaced radial bores and an axial bore therethrough,

a housing having an upper end and a lower end in said axial bore in slidable relation with said main body and having an axial bore therein, a peripheral cam on the lower end of said housing,

pressure producing means fixed to said main body and disposed in said housing axial bore at the lower end thereof for providing a moving force to said housing to move said housing vertically upwardly,

a triggering mechanism disposed in said housing axial bore above said pressure producing means and axially aligned therewith,

means providing a downwardly directed moving force on said triggering mechanism,

means holding said triggering mechanism at stationary relation with said main body, said holding means being adapted to release when a predetermined force is applied to said triggering mechanism both when directed horizontally therethrough and when directed vertically downward therethrough,

a plurality of shotgun shells inserted in said main body radial bores positioned to fire outwardly therefrom,

primer means in said main body radial bores for firing said shotgun shells, and a firing pin aligned with each of said primer means and having a rearward portion positioned in the upward path of said housing cam, so constructed and arranged that said primer means are actuated to fire said shotgun shells substantially simultaneously by the upward movement of said housing cam.

2. An antipersonnel mine as defined in claim 1 wherein said triggering mechanism is prevented from downward movement prior to use of said mine by a safety pin passing through said holding means.

3. An antipersonnel mine as defined in claim 1 wherein said housing is prevented from upward movement prior to use of said mine by a safety pin passing through said housing and said main body.

4. An antipersonnel mine as defined in claim 1 wherein said housing upper end is covered by a flexible cover firmly fixed to the upper end of said main body, said cover having a central aperture through which a portion of said triggering mechanism extends.

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