June 13, 1944. G. C. BERGER 2,351,474

LAND MINE

Filed Nov. 18, 1941

Fig. 1.

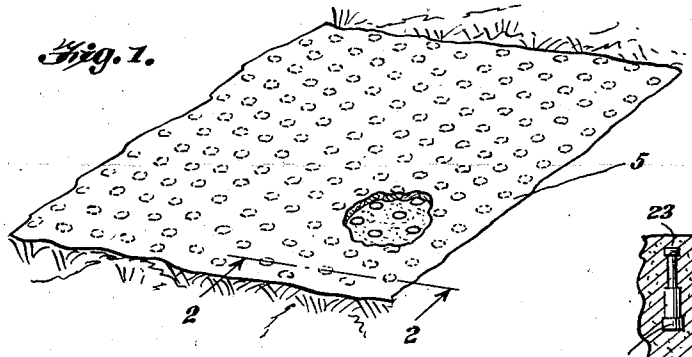


Fig. 2.

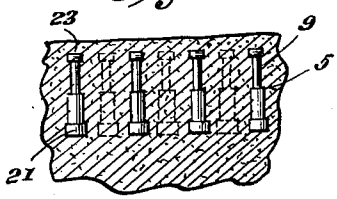


Fig. 3.

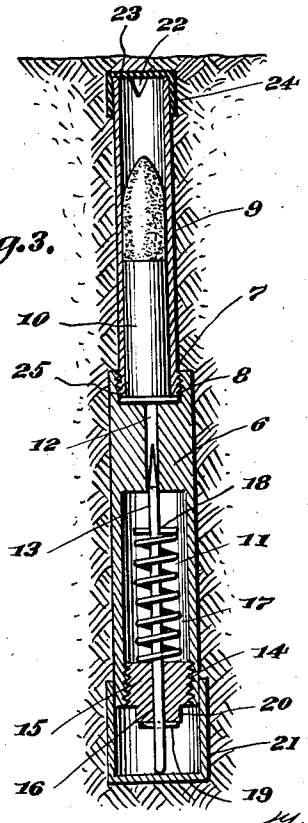


Fig. 4.

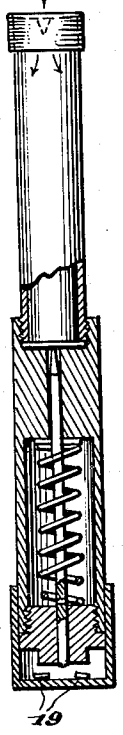


Fig. 5.

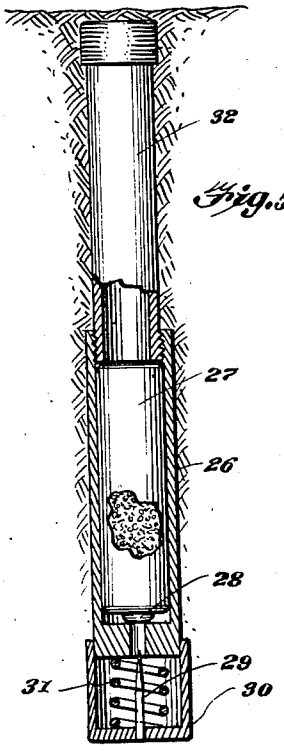
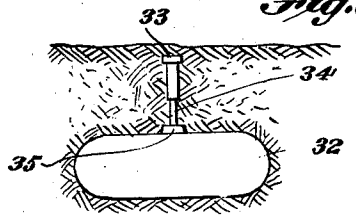


Fig. 6.



Inventor

GEORGE C. BERGER

By Lacey & Lacey,

Attorneys

Patented June 13, 1944 2,351,474

UNITED STATES PATENT OFFICE

2,351,474

LAND MINE

George C. Berger, Waubun, Minn.

Application November 18, 1941, Serial No. 419,632

4 Claims. (Cl. 102—8)

This invention relates to land mines for military purposes and more particularly to a subterranean mine operable by the impact of a person, tank or other movable object traveling thereover.

The object of the invention is to provide a projectile firing device of simple and inexpensive construction adapted to be embedded in the ground in the path of travel of an approaching enemy so that, as the enemy traverses a selected mined area, the foot of an infantryman or the wheels of an armored car by contact with the firing barrel will depress the same and actuate the device to discharge a bomb or projectile, thereby checking the advance of approaching troops and either entirely or partially wrecking the rolling equipment of the enemy.

A further object of the invention is to provide a device of the class described including a lower member or casing having a barrel detachably connected therewith and adapted to receive a cartridge, said casing being provided with a spring-pressed firing pin and having a receiving cup slidably fitted on the lower end thereof and operatively connected with a locking pin so that downward pressure exerted on the upper end of the barrel will shear the locking pin and fire the cartridge.

A further object is to provide a land mine which can be used either for firing a solid projectile or a bomb or explosive charge, the length of the firing barrel being such as to propel a bullet therefrom with sufficient velocity to materially damage any object it happens to hit.

A further object is to provide a projectile firing device which is light in weight and compact in construction to permit the same to be readily carried by a soldier in his pocket and also to permit large numbers thereof to be transported in a comparatively small space and quickly positioned in the ground without the employment of special tools or skilled labor.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

In the accompanying drawing forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawing:

Figure 1 is a perspective view of a portion of a roadway or other mined area showing a number of the devices embedded in the ground,

Figure 2 is a transverse sectional view taken on the line 2—2 of Figure 1,

Figure 3 is a vertical sectional view showing the firing pin set to discharge a projectile,

Figure 4 is a similar view, partly in elevation, showing the locking pin severed and the firing pin engaging the cartridge to fire the projectile.

Figure 5 is a vertical sectional view, partly in elevation, illustrating a modified form of the invention, and

Figure 6 is a similar view showing a further modification.

The improved device forming the subject-matter of the present invention is principally designed for mining the approach to a city, fort, magazine or other important place during time of war, and in Figure 1 of the drawing, a large number of said devices, indicated at 5, are shown embedded in the ground in close spaced relation to each other and with their upper ends disposed flush with or slightly below the surface of the ground, as indicated in Figure 2.

Each projectile firing device comprises a vertically disposed cylindrical body portion 6 having its upper end cut away to form a socket 7, the interior walls of which are threaded at 8 for detachable engagement with the correspondingly threaded end of a combined actuating member and firing barrel 9 adapted to receive a projectile carrying cartridge, indicated at 10.

The body portion 6 is provided with a chamber 11 opening through the bottom end thereof and forming a source of communication between said chamber and the socket 7 is an opening 12 which accommodates the adjacent end of a firing pin 13. The interior walls of the chamber 11 at the lower end thereof are threaded at 14 for engagement with a correspondingly threaded closure plug 15 and formed in said closure plug is a vertical opening 16 through which the lower end of the firing pin extends.

Surrounding the firing pin 13 is a coiled spring 17, one end of which rests against the closure plug 15 while the opposite end thereof engages a suitable stop 18 extending through the firing pin. The spring 17 is held under tension by means of a transverse locking pin 19 which normally bears against the lower face of a boss 20 depending from the closure plug 15 and serves to hold the upper end of the firing pin 13 in retracted position. The locking member or pin 19 is formed of any suitable metal capable of being readily severed by the boss 20 when downward pressure is exerted on the body portion 6. The firing pin 13 may be either of the center or rim type but it is preferred to use a center firing pin, as illustrated in Figure 3 of the drawing.

Embedded in the ground beneath the body portion 6 is a hollow or cup-shaped member 21 which slidably receives the body portion 6 and serves to prevent dirt from interfering with the operating mechanism.

The upper end of the barrel or actuating member 9 is provided with one or more V-shaped openings 22 to relieve the pressure in the upper portion of the barrel during the firing operation, and extending across the open end of the barrel is a closure cap 23 preferably formed of rubber and provided with a depending flange 24 which normally covers the openings 22, as shown.

In operation, the barrel 9 is detached from the body portion 6 and the cartridge 10 inserted therein with the flange of the cartridge shell bearing against the adjacent end of the barrel, as indicated at 25. The barrel is then threaded on the body portion and the device embedded in a roadway or other selected area to be mined, as illustrated in Figure 1 of the drawing. Prior to embedding the device in the ground, the firing pin will be set with the lower end thereof bearing against the bottom of the hollow base member 21 and with the closure cap 23 extending over the upper end of the barrel, as illustrated in Figure 3. As the enemy approaches the mined area, the feet of the infantrymen or the wheels of a tank or other rolling equipment will come in contact with the upper end of the actuating member or barrel 9 of one or more of the devices thereby depressing the same and forcing the body portion 6 downwardly within the hollow member 21. As the body portion moves downwardly, the inner edge of the boss 20 at the opening 16 will shear off the locking member or pin 19, thereby releasing the spring 17 and causing the firing pin to explode the cartridge 10 so as to maim the enemy and either entirely or partially wreck the rolling stock.

In order to recharge the device, it is merely necessary to detach the actuating member or firing barrel 9 and insert a new cartridge therein and a new locking pin through the lower end of the firing pin, as will be readily understood. Inasmuch as the depending flange of the closure cap 23 is formed of rubber, any compression in the upper end of the barrel incident to the firing operation will pass outwardly through the openings 22 and force the flange laterally to relieve the pressure. By increasing the size of the devices, they may be utilized as bombs for wrecking tanks, armored cars and other heavy equipment.

In Figure 5 of the drawing, there is illustrated a modified form of the invention, in which the cartridge is dispensed with, the body portion 26 being provided with a relatively large chamber for the reception of an explosive charge 27 including a detonating cap 28. In this form of the device, the firing pin 29 is secured to the bottom of the hollow base member 30 and surrounding said pin and interposed between the body portion and the bottom of the base 30 is a coiled spring 31 which serves to normally and yieldably hold the detonating end of the firing pin 29 in lowered or inoperative position. When pressure is exerted on the actuating member 32, the body portion 26 will be depressed against the tension of the spring 31 and the firing pin coming in contact with the detonating cap 28 will explode the charge 27, thus acting as a subterranean mine. The force of the explosive charge will, of course, demolish the device and scatter the parts thereof so that it cannot be used over again as in the case of the projectile firing device previously described.

In Figure 6 of the drawing, there is illustrated a further modified form of the invention particularly adapted for discharging a subterranean mine, indicated at 32. In using this form of the invention, the device is embedded in the ground with the hollow member 33 uppermost and with the firing pin extending longitudinally through the barrel 34 for contact with a detonating cap 35 so that, when downward pressure is applied on the hollow member 33, the firing pin will be actuated to detonate the cap 35 and explode the charge 32.

The devices are simple and compact in construction and light in weight so that they can be readily carried by a soldier in his pocket or large quantities of the devices transported in a comparatively small place and quickly positioned in the ground without the employment of special tools or skilled labor.

If desired, the device might be used as a warning signal to notify defenders of the approach of an enemy and in which event blank cartridges will be substituted for the projectiles.

It will, of course, be understood that the devices may be made in different sizes and shapes and constructed of any suitable material without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new is:

1. A device of the class described including a hollow member adapted to be embedded in the ground, a body portion slidably mounted within the hollow member and having its upper end threaded, a combined actuating member and firing barrel adapted to receive a cartridge and having its lower end threaded for detachable engagement with the threads on the body portion, a firing pin disposed within the body portion and having its lower end projecting within the hollow member, a spring operatively connected with the firing pin, and a locking pin extending through the projecting end of the firing pin and adapted to be severed by engagement with the body portion upon depression of the actuating member thereby to release the spring and cause the firing pin to detonate the cartridge.

2. A device of the class described including a hollow member adapted to be embedded in the ground, a body portion slidably mounted for vertical movement in the hollow member, a hollow actuating member operatively connected with the body portion and movable downwardly by pressure on its upper end, the upper end of the actuating member being normally open and the side walls thereof at said open end formed with a vent opening, a resilient cap normally closing the open end of the actuating member and provided with a depending flange fitting over the vent opening, an explosive charge, and a firing pin for detonating said charge upon depression of the actuating member.

3. A device of the class described including a hollow member adapted to be embedded in the ground, a body portion slidably mounted within the hollow member and having its upper end threaded and its lower portion provided with a chamber having a vertical opening leading therefrom and opening through the threaded portion thereof, a combined actuating member and firing barrel adapted to receive a cartridge and having its lower end threaded for detachable engagement with the threads on the body portion, a closure cap for the lower end of said chamber,

a firing pin extending through the chamber and having its lower end projecting below the closure cap, a spring fitted within the chamber and coiled around the firing pin, and a severable locking pin extending transversely through the projecting end of the firing pin and adapted to be severed upon depressing the upper end of the actuating member thereby to release the spring and fire the cartridge.

4. A device of the class described including a hollow member adapted to be embedded in the ground, a body portion slidably mounted for vertical movement within the hollow member, a combined firing barrel and actuating member operatively connected with the body portion and having its upper end disposed adjacent the surface of the ground, a cartridge fitted in the barrel, a spring-pressed firing pin cooperating with the hollow member, and a locking pin fitted to one end of the firing pin and adapted to be severed by the body portion and release the firing pin upon depression of the actuating member by the weight of an object passing over the same.

GEORGE C. BERGER.