J. R. STEEL.

GAS AND SHRAPNEL LAND MINE.

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1,239,134.

Patented Sept. 4, 1917.

Fig. 3.

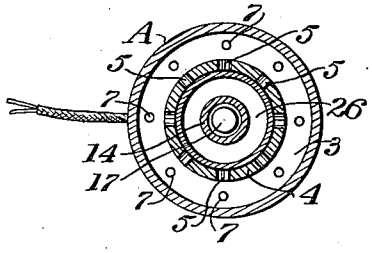


Fig. 2.

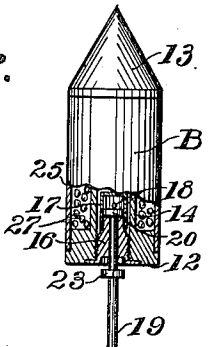


Fig. 1.

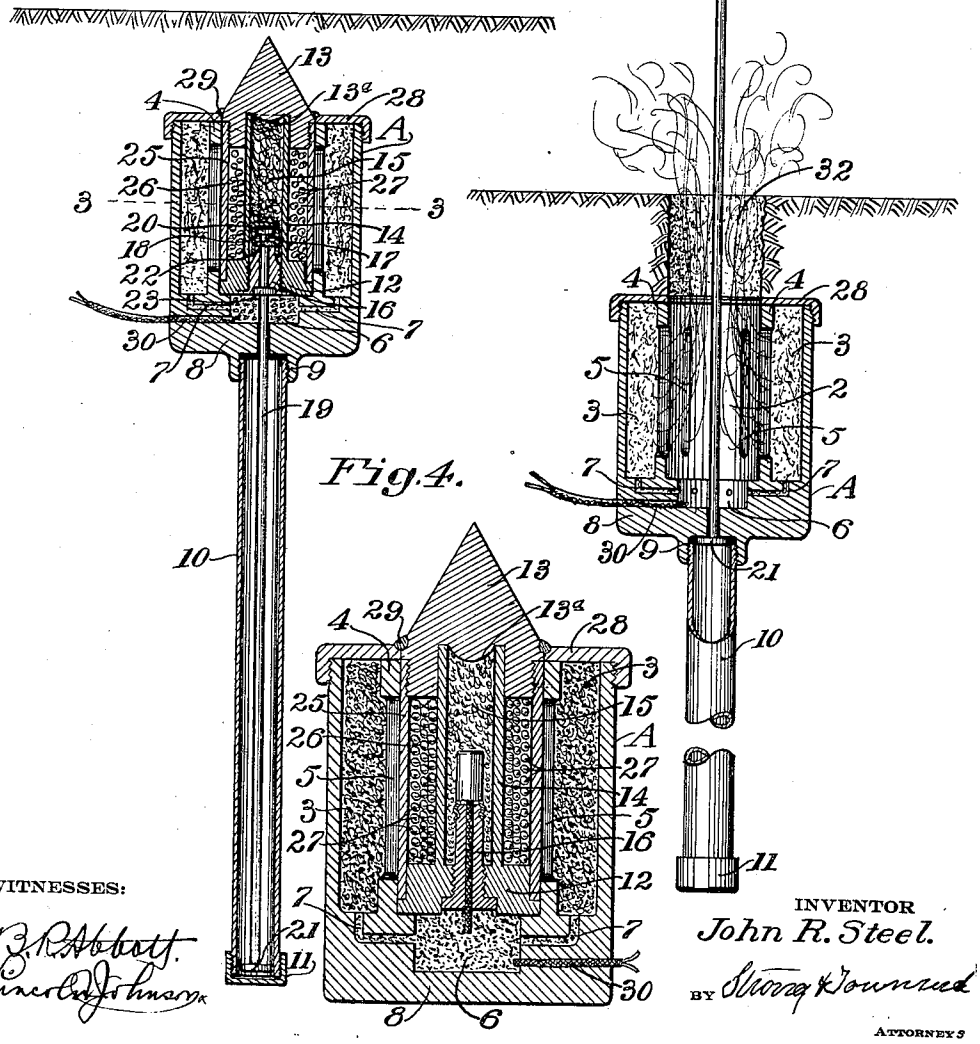


Fig. 4.

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GAS AND SHRAPNEL LAND-MINE.

1,239,134. Specification of Letters Patent. Patented Sept. 4, 1917.

Application filed July 5, 1916. Serial No. 107,541.

To all whom it may concern:

Be it known that I, JOHN R. STEEL, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Gas and Shrapnel Land-Mines, of which the following is a specification.

This invention relates to a gas and shrapnel land mine.

One of the objects of the present invention is to provide a land mine of the character described which is adapted to be buried and which is capable of discharging a shrapnel bomb and generating and liberating a gas. Another object of the invention is to provide means for exploding the bomb after it has been projected to a predetermined elevation with relation to the mine or the ground surface and furthermore, to provide means for directing the discharge of the shrapnel.

Further objects will hereinafter appear.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings in which—

Figure 1 is a vertical, central, longitudinal section of the land mine, showing the same in a buried or hidden position.

Fig. 2 is a similar view, showing the bomb projected and in position to be exploded.

Fig. 3 is a cross section on line 3—3, Fig. 1.

Fig. 4 is a vertical, central, longitudinal section of the land mine, showing another form of same.

Referring to the drawings in detail, A indicates in general a metal casing in which is formed a central chamber 2 for the reception of a shrapnel bomb hereinafter to be described, and an annular chamber 3 for the reception of a substance which, when ignited, is capable of generating and liberating a gas; a tubular central member 4 being provided for the purpose of separating or forming the chambers 2 and 3. The walls of said tube are provided with a plurality of elongated slots 5 to form communication between the two chambers and a lower chamber 6 for the reception of an explosive charge is also provided in the base of the container, the purpose of which will hereinafter be described. The chamber 6 opens directly into the central bomb receiving chamber 2 and also communicates with the annular chamber 3 by means of the slots 5 and the communicating ports 7 shown. Formed on the base section 8 of the container is a downwardly projected, internally threaded extension 9 and screwed into said extension is a pipe section 10 of suitable length, the lower end of which is closed by a cap 11. The bomb proper consists of a base section 12 and a head section 13. Formed integral with the base section is an upwardly extending tubular member 14, which is provided for the reception of an explosive charge and adapted to be screwed through the base section in such a manner as to enter the central chamber 15 formed within the tube 14 is a hollow plug 16. The upper end of this plug is reduced in diameter and externally threaded to receive an inclosing cap 17, which is perforated as at 18. Projecting through the plug 16, the chamber 6, the base 8 and reaching approximately to the bottom of the tube 10 is a rod 19. The upper end of this rod is provided with a head 20 and the lower end with a stop collar 21. The head and the rod constructed as here shown, will hereinafter be termed the detonating head and rod. Mounted on top of the reduced section of the plug 16, and surrounding the rod is a fulminating or explosive cap 22 which is adapted to be exploded by the head 20 to fire the explosive charge contained within the chamber 15 and secured on the rod or formed integral therewith below the plug 16 is a friction plug 23, which is adapted to enter a recess formed in the plug for its reception. Suitably secured on the base member 12 of the bomb, and forming the exterior wall or casing of the bomb, is a tube 25. This tube forms an annular chamber 26, exterior of the tube 14, and said chamber is provided for the reception of a suitable form of shrapnel such as indicated at 27. Forming a closure for the chambers 15 and 26 is the head member 13 previously described. This head is screwed into the upper end of the tube 25 and its center portion is cored out, as at 13^a to receive the upper end of the tube 14 and also to form a perfect closure for same, which will separate the chambers 15 and 26. The container A completely charged and containing the

bomb generally indicated at B, is sealed up by means of a cap 28 which primarily serves as a closure for the annular chamber 3. This cap is provided with an annular internal groove 29, which is adapted to be filled with a sealing agent, such as wax or the like, to prevent admission of moisture between the cap and the head or sides of the bomb.

In operation, when preparing the mine, it is first necessary to place a fulminating cap 22 within the chamber 15 in the position shown, and then to apply the perforated inclosing cap 17. The chamber 15 may now be filled with a high-power explosive, such as triton or gun cotton, the perforated inclosing cap 17 being provided for the purpose of preventing the explosive charge from filling the space between the detonating head and the cap or from interfering with the action of same. The exterior annular chamber 26 may now be filled with shrapnel and the head 13 applied. The lower chamber 6 is then charged with an explosive such as black powder or the like and the bomb with attached rod 19 may now be inserted. The exterior annular chamber 3 of the container is also charged with a substance, which, when ignited, will generate and liberate a gas. The cap 28 is then applied and the head 13 sealed in place by filling the annular groove 29 with a sealing medium, as previously described. An electrically ignited fuse 30 may now be inserted through the base section 8 of the container and the bomb as a whole, with attached pipe 10, may be buried as deep as may be desired. The wires operating the electric fuse 30 may similarly be buried and connected with a switch mechanism controlled at some distant point and not here shown. The firing of the bomb and the liberation of the gas will be as follows:

The circuit closed through the wires connected with electric fuse 30 will ignite and explode the black powder charge contained in the chamber 6 and this in turn will generate sufficient pressure to project the bomb as shown in Fig. 2. The distance or elevation to which the bomb is projected, is however, controlled by the length of the rod 19 and in most instances will probably not exceed four feet above the ground surface, as this has been found the most effective elevation. The upward projection of the bomb causes the rod 19 to be lifted with relation to the pipe 10 and similarly causes the stop collar 21 to engage with the bottom or base of the container. This sudden stoppage of the rod against an upward movement pulls the friction plug 23 out of its seat and thereby permits the detonating head to engage the cap 22 and explode same. The force of this explosion passes through the perforations in the inclosing cap or bursts the same, thus igniting the high-power explosive contained within the chamber 15. This immediately bursts the entire bomb and throws the shrapnel in, practically speaking, every direction on a lateral plane. This lateral projection of shrapnel at an elevation of approximately four feet, has been found to be very destructive as it is bound to strike a man, whether kneeling or approaching in an upright position. The lateral discharge of the shrapnel is caused by the provision of the head 13 and the base member 12. These members break the force of the explosion, both in an upward or downward direction, and consequently directs the force of the explosion laterally with relation to the longitudinal axis of the bomb. The explosive charge contained in the chamber 6, as previously described, not only serves the purpose of projecting the bomb B but also serves the purpose of igniting the substance contained within the annular chamber 3. This, when ignited, immediately begins to generate and liberate a gas, which discharges through the slots 5 and the hole 32 left in the ground by the upward passage of the bomb. The gas will continue to be liberated until the substance is finally consumed and as this time limit merely depends upon quantity, it can easily be seen that an advancing army will not only meet with a shrapnel fire of the most destructive sort but also with a gas which may continue discharging from the ground for a considerable period of time, thus making it practically impossible for an invading force to pass the mined area. The height to which the bomb is projected before it is exploded may be varied by increasing or decreasing the length of the rod 19 and the inclosing pipe 10. Another form of the device shown in Fig. 4 eliminates the use of the detonating rod and head entirely. This is accomplished by inserting a time fuse in the plug 16. This is particularly desirable where the bomb is projected to higher elevations as it eliminates the necessity of the rod 19 and the inclosing pipe 10. This time fuse is ignited by the black powder charge contained in the chamber 6 and as the length of the fuse may be increased or decreased, as conditions demand, it can easily be seen that it is possible to project and explode the bomb at practically any elevation desired. The structure of the bomb and the container shown in Fig. 4 is otherwise similar to that shown in Figs. 1 and 2.

The materials and finish of the several parts of the bomb and container may otherwise be such as the judgment of the manufacturer or local conditions may require.

I wish it understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims, and that I

do not wish to limit myself to the specific design and construction here shown.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A gas and shrapnel land mine, comprising a container having an annular and a central chamber formed therein, together with communicating ports, said central chamber adapted to receive a shrapnel bomb and an explosive charge for its expulsion and said annular chamber adapted to receive a substance which, when ignited, generates and liberates gas, means for igniting the explosive charge to expel the bomb and to ignite the substance contained in the annular chamber, and means for exploding the bomb after expulsion and at a predetermined elevation.

2. A gas and shrapnel land mine comprising a container having an annular and a central chamber formed therein, together with communicating ports, said central chamber adapted to receive a shrapnel bomb and an explosive charge for its expulsion and said annular chamber adapted to receive a substance which when ignited, generates and liberates a gas, means for igniting the explosive charge to expel the bomb and to ignite the substance contained in the annular chamber, means connecting the bomb with the container to limit the height of projection and to explode the bomb.

3. A gas and shrapnel land mine comprising a container, having an annular and a central chamber formed therein, together with communicating ports, said central chamber adapted to receive a shrapnel bomb and an explosive charge for its expulsion and said annular chamber adapted to receive a substance which when ignited, generates and liberates a gas, means for igniting the explosive charge to expel the bomb and to ignite the substance contained in the annular chamber and a detonating rod and head connecting the bomb with the container to limit the height of projection and to explode the bomb.

4. A mine comprising a receptacle, having a chamber formed therein to receive a projectile, an explosion chamber formed in the receptacle below the projectile, a gas producing chamber in the receptacle around the projectile, and means whereby on the firing of the mine the projectile is discharged and the contents of the gas producing chamber are liberated.

5. A gas and shrapnel land mine, comprising a container having a chamber formed therein for the reception of a shrapnel bomb, and a chamber for the reception of a substance capable of generating and liberating a gas, means for discharging the bomb, and means for generating and liberating gas after the bomb is discharged.

6. A mine comprising a receptacle, having a chamber formed therein to receive a projectile, an explosion chamber formed in the receptacle below the projectile, a gas producing chamber in the receptacle around the projectile, and means whereby on the firing of the mine the projectile is discharged and the contents of the gas producing chamber are ignited and gas is liberated.

7. A gas and shrapnel land mine, comprising a container having an annular and a central chamber formed therein, said central chamber adapted to receive a shrapnel bomb and an explosive charge for its explosion and said annular chamber adapted to receive a substance which when ignited generates and liberates a gas, and means for igniting the explosive charge to explode the bomb and to ignite the gas generating substance contained in the annular chamber.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN R. STEEL.

Witnesses:
JOHN T. McGHEE,
M. V. COLLINS.