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A. ADELMAN

2,376,332

ANTITANK MINE FUSE

Filed June 14, 1941

Fig. 2.

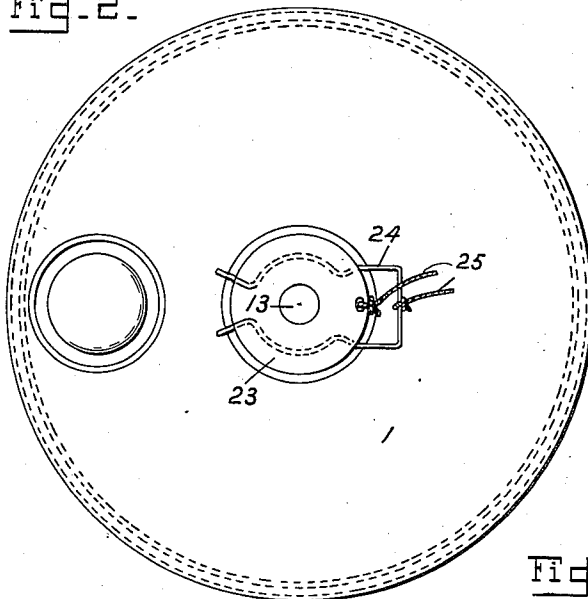


Fig. 3.

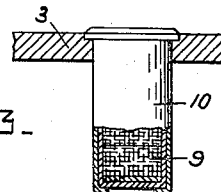
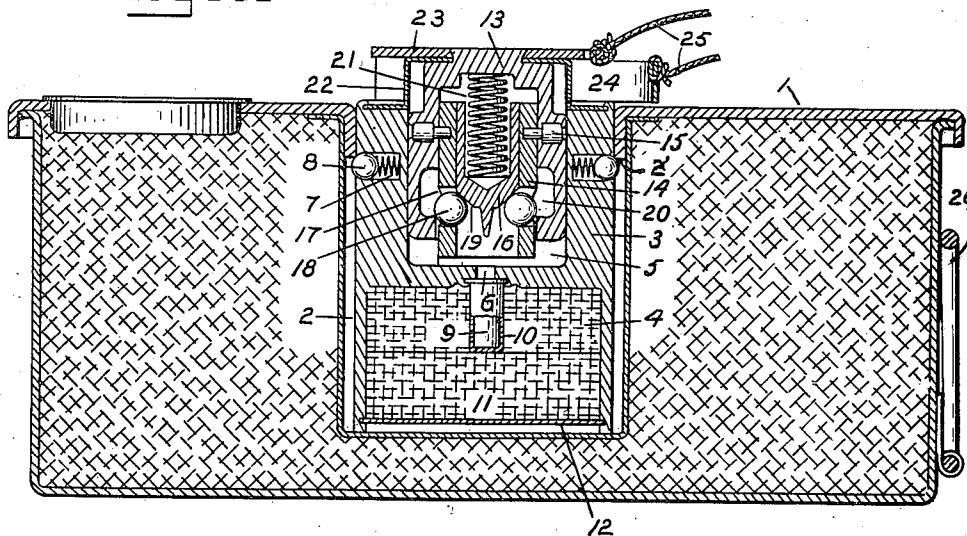


Fig. 1.



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ANTITANK MINE FUSE

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2 Claims. (Cl. 102—70)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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 a fuse for an anti-tank mine or other explosive body.

It is an object of this invention to provide an improved form of fuse for any explosive body which is adapted to function when an exposed element of the fuse mechanism is engaged by a substantial force.

It is a further object of this invention to provide a fuse in which the spring elements will not be subject to fatigue in storage.

It is a further object of this invention to provide a novel form of anti-tank mine which may be readily and quickly assembled under field conditions.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 is a longitudinal sectional view of the mine and fuse with the parts secured in unarmed position.

Fig. 2 is a plan view of the mine with the safety clip in position, and

Fig. 3 is a fragmentary sectional view showing an alternative form of assembling the primer.

Referring to the drawing by characters of reference, 1 indicates the explosive body of a mine adapted for use in defense against tanks and the like. This explosive body is formed with a cavity 2 in its upper surface for the reception of a fuse body 3. The cavity is provided with an inner flange forming a shoulder 2' or with a groove in its wall to engage the fuse-retaining means.

The detonating device comprises the body 3 in which axial cavities 4 and 5 connected by an opening 6 have been formed. The body 3 is further provided, near its upper end, with a plurality of radial cavities housing springs 7 and ball detents 8 which engage the flange formed in the cavity in the mine body for releasably maintaining the fuse body within the cavity in the mine. The lower cup-shaped cavity 4 is provided with a primer 9 of lead azide, mercury fulminate or other known fulminating compound which may be secured against the opening 6 by having a portion of the body 3 spun over the edge of a flanged primer containing cup 10. Figure 3 shows a modified method of securing a primer in the body of the fuse. In this case the opening 6 is made of the proper size to accommodate a rimmed cap-

sule, for example, a standard center fire cartridge case with its rim engaging the upper surface of the partition between the cavities. An auxiliary primer charge may be loaded in the interior of the capsule. The remainder of the cavity 4 is loaded with a booster 11 of tetryl or the like and may be sealed against the penetration of moisture by a disk 12 secured to the rim of the cavity.

The mechanical elements of the fuse are supported in the cavity 5 formed in the upper portion of the body 3. The firing mechanism consists of a firing member 13 slidable longitudinally in the cavity 5. In an axial bore in the member 13 a concentric sleeve member 14 is secured against relative longitudinal movement by shear pins 15. Inside the sleeve member and concentric therewith is a firing pin 16. Radial openings 17 are formed in the walls of the sleeve 14 for the passage of retaining balls 18 engaging a conical face 19 surrounding the tip of the firing pin. A circumferential groove 20 is formed in the inner wall of the member 13 which will receive the balls 18 when aligned with the openings 17. A spring 21 is confined under light pressure between the firing pin and the member 13. As this spring is not under high tension in storage it will not be subject to fatigue if stored over long periods of time. It will be seen that when any substantial load is applied to the member 13 the pins 15 will be sheared and the resulting relative movement between 13 and the sleeve 14 will result in compression of the spring and in ultimate alignment of the groove 20 with the openings 17. When this condition is reached the balls will be permitted to escape from their engagement with the firing pin which will be driven by the spring through the opening 6 to pierce the primer 9 and initiate the explosion of the mine proper. A seal 22 of thin metal or other like material is secured between the top of the body 3 and the upper end of the member 13 to form a moisture proof joint. A disk 23 is secured to the upper end of the member 13 to receive the load either directly or from an auxiliary actuator element and to form a shoulder for the engagement of a safety clip 24 formed as shown in Fig. 2. The space allowed between the bottom of the cavity 5 and the lower end of the cylindrical member 14 insures that with the safety clip in position forces applied to the disc 23 will not be transmitted to the shear pins 15. A retaining cord 25 is secured to the clip at one end and at its other end to the disc 23. The fuse may be armed by withdrawing the clip, and the retaining cord ensures that the clip will be readily available in case it is desired to

return the mine to safe condition. For convenience in handling the mine a carrying ring 26 is provided.

Any desired form of auxiliary contact device may be adapted to cooperate with the disc 23 and enlarge the area from which the weight of a tank or other object will be effectively communicated to the firing member 13.

Although it is not the preferred method of employing the invention it is contemplated that the firing spring may be initially compressed and that the firing member serve principally as a releasing device. In either case the fuse itself would be as suitable for use in bombs or other projectiles as for use in anti-tank mines.

I claim:

1. A percussion fuse comprising a cylindrical casing member adapted to be inserted in an explosive body, a primer and a booster charge in said casing, a firing member slidable longitudinally in said casing and protruding therefrom, said firing member being formed with an internal bore having a circumferential groove in its lower portion, a sleeve member in the internal bore in said firing member and retained therein against longitudinal movement relative to the firing member by shearable means, radial bores in said sleeve member opposing the wall of the internal bore of the firing member, ball detents in said bores and a firing pin slidable longitudinally in said sleeve member and held in engagement with

said detents by a spring engaging the firing member whereby the firing pin will be projected against said primer when sufficient force is applied to the firing member to overcome the shearable means and align the circumferential groove with said radial bores.

2. A percussion fuse comprising a casing adapted to be inserted into an explosive body, a primer associated with said casing, a firing member slidable longitudinally in said casing and protruding therefrom, said firing member being formed with an internal cylindrical passage longitudinally thereof having a circumferential groove in its lower portion, a sleeve member in said internal passage of said firing member and retained therein against longitudinal movement relative to the firing member by shearable means, radial openings in said sleeve member and so disposed relative to said circumferential groove that they are overlapped by the lower edge of said circumferential groove, a firing pin slidable longitudinally in said sleeve member for striking the primer and having a shoulder thereon, ball detents in said radial openings abutting against the lower edge of said circumferential groove and said shoulder, and spring means operative between the said firing member and the said firing pin for urging the shoulder on said firing pin into contact with the said ball detents.

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