Sept. 25, 1934. J. D. MORENO ET AL 1,975,014

HAND GRENADE

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Fig. 1.

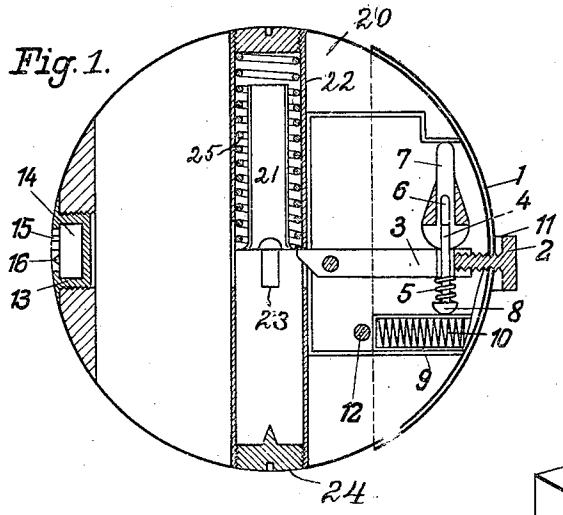


Fig. 4.

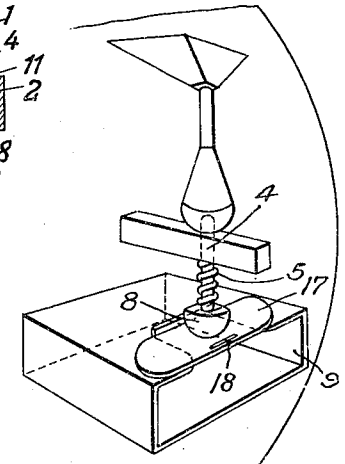


Fig. 2.

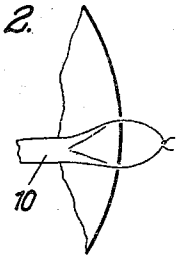


Fig. 2a.

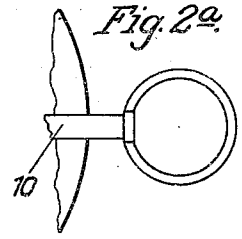
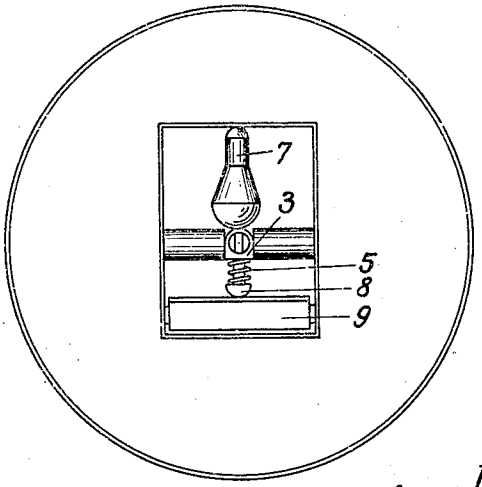


Fig. 3.



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HAND GRENADE

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5 Claims. (Cl. 102—29)

The present invention relates to improvements in hand grenades and is characterized essentially by the use of a detonating device the operation of which is extremely simple and by which the risks and drawbacks entailed by the use of these missiles are eliminated. The kinds of hand grenades hitherto used suffer from the following defects:

Risk of explosion in transit, owing to the extreme delicacy of the mechanism, and the difficulties attending transport in the war zone.

Danger of handling. In handling the various hand grenades hitherto used many accidents may occur. In percussion grenades one runs the risk of their being dropped or of the bomb-thrower falling; with time-fuse grenades it may, and in the last great war did, occur that the grenade burst before it reached the target, or that it did not explode on reaching it. In the first case, the thrower may be within the danger zone; and in the second, the grenade may be picked up and thrown back. It may also happen that the grenade is not thrown, owing to the bomber having been wounded a moment before, in which case he runs a very grave risk. In grenades having a stick provided with a string of a certain length, the unwinding of which sets the detonator in action, there is the risk either of letting the string go before it is fully unwound or of causing the grenade to return by pulling the string when the process of unwinding has come to an end; in the former of these two alternatives, the grenade will have been rendered useless, and in the latter it will be caused to explode near enough to endanger the thrower.

Finally, with all known types of grenades, when they fail to explode, there is a manifest risk entailed in picking them up, as the reason for the failure to explode and consequently the exact position of the mechanism are unknown, and an untimely explosion may well occur whilst they are being picked up.

The essential conditions that an ideal grenade should fulfill to overcome these drawbacks, are the following:

(1) Absolute safety in transport and handling up to the moment of throwing.

(2) Certainty at the time of throwing that the detonating device cannot enter into action until the grenade is beyond the zone of danger to the thrower.

(3) Certainty that the grenade will explode at the very moment of reaching the target, and neither before nor after.

(4) An arrangement enabling the state of the mechanism of an unexploded grenade to be ascertained at a glance, so as to enable it to be removed with perfect safety.

The grenade, according to the present invention, satisfies these main requirements in conditions of extreme simplicity of working and low cost of manufacture.

To fulfill the first condition, the grenade is provided with a striker such as indispensable for operating the detonating device, which striker may be removed from or fitted to the grenade in an instant.

In order to fulfill the second condition, a means for pulling is provided consisting of a tape that, only on reaching its full stretch, releases the safety catch of the detonating device, and does so not wholly but in part, leaving it ready to release itself and cause the explosion when the grenade strikes the target.

The third condition is fulfilled by the fact that after the safety-catch has been partly released, the detonating device is left in such a position as to convert the grenade into a percussion bomb.

Lastly, the fourth condition is satisfied in as much as the position of the detonating device in an unexploded grenade is ascertainable by mere visual examination.

We have established two different forms of construction based upon the same principle. According to the one, the bomber retains a part in the shape of a tape, which causes the safety-catch of the grenade to fall; according to the other, this releasing part separates from the grenade of itself during the flight of the latter through the air.

To enable the following description to be more readily understood, the drawing is attached illustrating both embodiments of the invention.

In the drawing, Fig. 1 is a section through A—B of Fig. 3.

Figs. 2 and 2^a are details, in section, of the form of construction shown in Fig. 1.

Fig. 3 is a general view of the grenade seen from the side on which the firing device lies, which latter is shown in front view.

Fig. 4 shows the firing device in a variant form of construction from that shown in the three last figures.

As will be seen from the drawing, the grenade forming the subject of the invention is composed of a spherical body 20, inside which are arranged the explosive charge and grape-shot as well as the detonating device and the mechanism actuating the same.

The detonating device consists of a cartridge

21 arranged inside a tube 22 and provided with a detonator 23 suitable for being struck by a striker 24 provided at the opposite end of the tube 22. This striker consists of a member that is fitted to the body of the grenade by a screw- or bayonet-joint enabling it to be withdrawn or fitted instantly; for example, at the moment of use, and of being removed during transport, thus constituting a first and absolutely effective safe-guard.

The cartridge lies in a position of rest, against the pressure of a spring 25, which projects it against the striker, thus causing the explosion; and is held in that position by the firing mechanism which, until released, prevents the cartridge from being displaced.

The spherical cap 1 has a hole in the centre to take screw 2, the end of which penetrates into the firing lever 3. This lever, close to the end in which is inserted the screw 2, is bored to take the pin 4 which is pressed downward by the spring 5; the upper end of pin 4 penetrates into the opening 6 bored in the part 7, whilst the lower end 8 rests on a box 9 containing the tape 10 that operates the mechanism. This tape is folded and not wound. The tape 10 (Figs. 2 and 2a) either passes split in two through two holes provided in the cap 1 and forms a knot and a ring for the bomber to use if required for throwing the grenade whilst retaining the tape and the cap in his hand; or else the tape may be arranged, as shown in the drawing, to pass through the cap and be fastened to a ring made of metal, for example, so that, when the grenade is to be used at very short distances, the bomber may draw out the tape until a mark appears on it very near its inner end—an arrangement that may be of use in the case of hand-to-hand or close fighting.

The advantages and operation of the device just described are as follows—When the grenade is in a state of rest, that is to say, as shown in Fig. 1, the screw 2 holds the cap 1 fixed against the outer surface of the grenade. It also holds the firing lever 3 and the pin 4 in a fixed position and absolutely prevents the accidental firing of the grenade, this being one of the characteristics of the invention. Between the screw 2 and the cap 1, a leather washer 11 is provided, forming a close joint, and preventing water or other fluids from penetrating into the grenade.

At the moment of using the grenade, the screw 2 is unscrewed and the grenade is either thrown in the manner last described, so that the cap exerts a pull upon the tape 10, or the cap and the tape are retained in the hand by means of the loop forming the end of the tape, as shown in Figure 2. In either case, the tape unfolds from inside the box 9 and, on becoming tensioned, it exerts a pull on this box, to the bottom of which it is knotted at 12, with the result that the box is pulled out from inside the grenade. To facilitate this operation and prevent the box from being caught, it is given a semi-circular shape. When the box is separated from the body of the grenade, the pin 4, under the action of the spring 5, is expelled from the opening 6 bored in the part 7, and releases the firing lever 3, which is now only held in position by the part 7 resting upon it. It will be readily understood that, in this position, the blow produced by the grenade striking the target causes the full release of the lever 3 and the projection of the cartridge on to the striking spike.

According to the variant shown in Fig. 4, the box 9 is arranged in the body of the grenade and at the top has an opening underneath the end 8 of pin 4. Over that opening is fitted a plate 17 having a groove 18 through which passes the tape, the inner end of which is secured to the part of the plate lying between its edge and the said groove. It will be readily understood that plate 17 stops any downward movement of the pin 4 under the action of spring 5 as long as the tape is not fully unfolded, but that the tape, on becoming fully unfolded, exerts a pull on the plate 17, displacing it and allowing the pin 4 to drop under the action of spring 5.

As will be seen from the drawing, the ring for sustaining the grenade is replaced by a plug 13 the inner bore of which is square down to certain depth, to enable the plug to be screwed into the grenade with a key, after which the bore is round, as shown at 14; the object of this shape of plug is the following. On two faces of the square-bored part are provided grooves 15, and at the bottom of the said part a notch 16. On the other hand, the bomber is provided with a belt studded throughout its length with stout pegs (which are not shown) which fit into the bore of the plug in the grenade so that two knobs provided on each peg enter into the grooves 15; thus a mere turn of the grenade is sufficient to snap it on to the peg, the knobs of which fit into the lower notch 16. This simple bayonet-socket enables a large number of grenades to be rapidly carried and also rapidly and easily handled by each bomber.

A grenade, without changing the firing mechanism, can be cylindrical or of any other shape. The tape-box serving as a stop for that mechanism might also be replaced by a plain block and the tape tied to it and arranged, wound externally, on the body of the grenade.

We claim:

1. A hand grenade comprising a body to contain an explosive material, a cartridge movable in the body and having a detonator, means to guide the cartridge, a spring to move the cartridge, a striker engageable by the detonator of the cartridge when the latter is moved by the spring, a firing lever in the body, a removable cap on one side of the body, and a screw carried by the cap securing the same to the body and engageable with the lever to hold the latter in the required position to prevent movement of the cartridge while the cap is in place, and to release the lever when the cap is removed.

2. A hand grenade comprising a body to contain an explosive material, a cartridge movable in the body and having a detonator, means to guide the cartridge, a spring to move the cartridge, a striker engageable by the detonator of the cartridge when the latter is moved by the spring, a firing lever in the body, a removable cap on one side of the body, and a screw carried by the cap securing the same to the body and engageable with the lever to hold the latter in the required position to prevent movement of the cartridge while the cap is in place, and to release the lever when the cap is removed, additional means to hold the lever in cartridge detaining position and releasing means for the additional lever holding means and including a tape arranged in the body and connected to the cap and active, after the grenade is thrown, to release the additional holding means.

3. A hand grenade comprising a body to contain an explosive material, a cartridge movable in the body and having a detonator, means to

guide the cartridge, a spring to move the cartridge, a striker engageable by the detonator of the cartridge when the latter is moved by the spring, a firing lever in the body, a removable cap on one side of the body, and a screw carried by the cap securing the same to the body and engageable with the lever to hold the latter in the required position to prevent movement of the cartridge while the cap is in place, and to release the lever when the cap is removed, additional means to hold the lever in cartridge detaining position and releasing means for the additional lever holding means and including a tape arranged in the body and connected to the cap and active, after the grenade is thrown, to release the additional holding means, said additional lever holding means comprising a stop element bearing between said lever at a fixed point in the body, a pin to hold said stop element in holding position, a spring to project said pin and thereby release said stop element and also including a member to hold said pin against the tension of said spring and displaceable by the pull of the tape when the grenade is thrown.

4. A hand grenade comprising a body to contain an explosive material, a cartridge movable in the body and having a detonator, means to guide the cartridge, a spring to move the cartridge, a striker engageable by the detonator of the cartridge when the latter is moved by the spring, a firing lever in the body, a removable cap on one side of the body, and a screw carried by the cap securing the same to the body and engageable with the lever to hold the latter in the required position to prevent movement of the cartridge while the cap is in place, and to release the lever when the cap is removed, additional means to hold the lever in cartridge detaining position and releasing means for the additional lever holding means and including a tape arranged in the body and connected to the cap and active, after the grenade is thrown, to release the additional holding means, said additional lever holding means comprising a stop element bearing between said lever at a fixed point in the body, a pin to hold said stop element in holding position, a spring to project said pin and thereby release said stop element and also including a member to hold said pin against the tension of said spring and displaceable by the pull of the tape when the grenade is thrown, a case in the body in which the tape is arranged, the displaceable element being a plate to which the tape is attached and which is arranged on the tape case.

5. A grenade as claimed in claim 1, including a tape in the body marked close to its inner end and means for drawing out the tape up to said mark before throwing the grenade when it must be thrown for short distances.

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