J. C. MILLER.

HAND GRENADE.

APPLICATION FILED AUG. 17, 1917.

1,319,103. Patented Oct. 21, 1919.

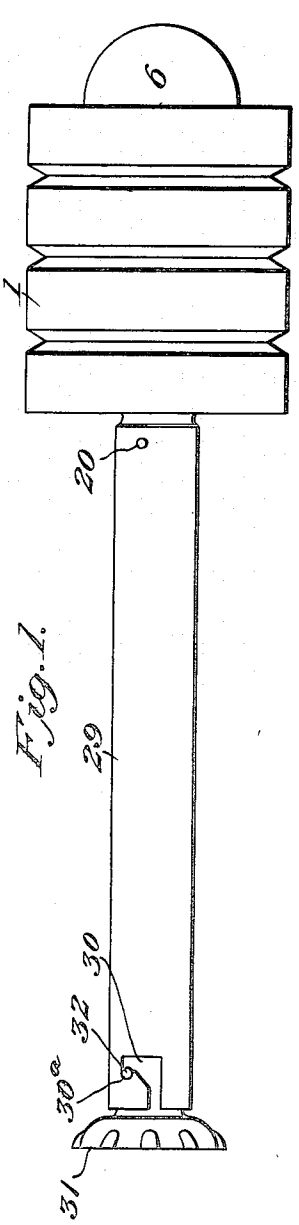


Fig. 1.

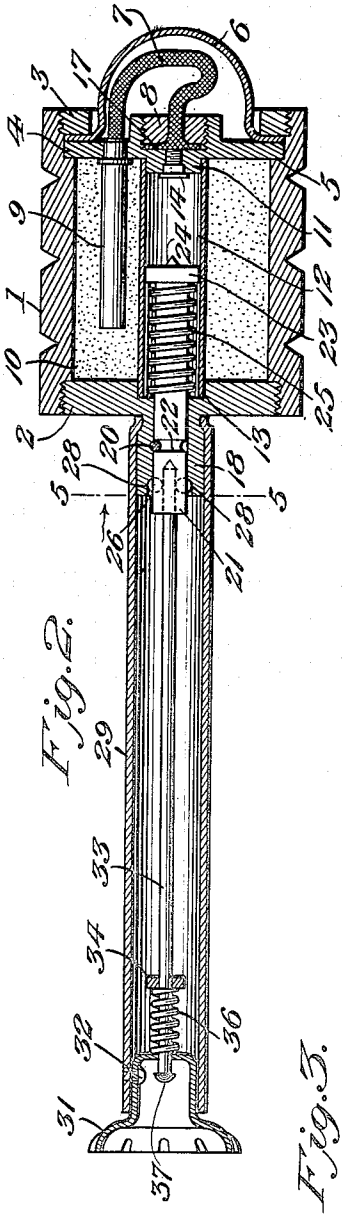


Fig. 2.

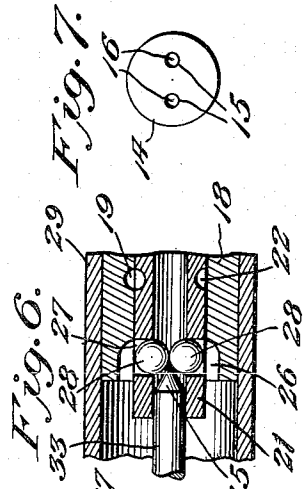


Fig. 6.

Fig. 7.

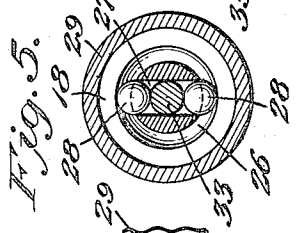


Fig. 5.

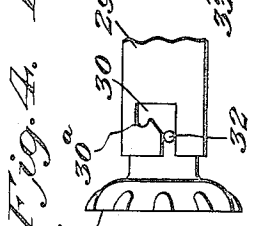


Fig. 4.

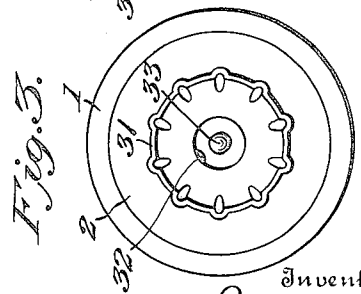


Fig. 3.

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HAND-GRENADE.

1,319,103. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed August 17, 1917. Serial No. 186,704.

To all whom it may concern:

Be it known that I, JOHN C. MILLER, a citizen of the United States, residing at Wissinoming, Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Hand-Grenades, of which the following is a specification.

This invention relates to hand grenades adapted to be thrown, in trench warfare, or dropped, as a bomb from an aeroplane.

My object is to provide a simple and reliable grenade which can be locked or made secure when being shipped or carried about and readily conditioned for use without danger to the soldier or aviator using it.

A further object is the provision of a hand grenade of novel construction wherein firing can only occur by a positive separation of the handle and firing pin from the grenade proper as, for instance, when the parts are set for separation and the grenade is actually thrown or allowed to drop.

In carrying out the last-named object of the invention, I provide a handle and firing pin adapted to be retained in the hand of the soldier when the grenade proper is thrown or dropped, and combine therewith novel locking means for holding the firing mechanism or hammer until the handle and firing pin have separated from the grenade proper.

It has been found necessary in hand grenades to provide for the escape of the gas incident to the explosion of the cap which ignites the time fuse. In the present invention there is provided a cap of novel form which is provided with frangible means so that when the cap is exploded at the time the grenade is thrown, the frangible portion will be blown out, allowing the gases from the exploded cap to escape. The construction of the grenade is such that when it is thrown or dropped, the separation of the parts leaves an opening from the body of the grenade to the atmosphere and, consequently, the gas vents from the exploded cap.

The invention contemplates, still further, the provision of a hand grenade embodying certain improved instrumentalities and novel arrangements and combinations of parts appearing more fully hereinafter.

In the accompanying drawings:—

Figure 1 is a side elevation showing the parts in locked condition, ready for shipping or handling;

Fig. 2, a longitudinal section with the parts in locked condition;

Fig. 3, an end elevation;

Fig. 4, a detail view showing the handle or knob in unlocked condition;

Fig. 5, an enlarged cross-section on line 5—5, Fig. 2;

Fig. 6, an enlarged longitudinal section showing the firing stem in the position it assumes as it leaves the locking balls; and

Fig. 7, a detail of the explosive cap.

The body of the grenade comprises a tubular part 1 having heads 2 and 3 detachably screwed thereinto. The head 3 holds a disk 4 against a shoulder 5. A hollow, substantially semi-spherical flange cap 6 is held between the collar 3 and the disk 4, within which is the time fuse 7. By removing the head 3, the cap 6 can be taken off and the proper length of fuse inserted, according to conditions of use. One end of the fuse is passed through a screw-threaded bushing 8 threaded into a hub on the disk 4, the end of the fuse being flattened out and clamped by said bushing 8. The other end of the fuse connects with the detonating cap 9, which is set into the disk 4 and lies within the body 1 so that it will explode the explosive charge contained within the space 10 when the fuse 7 has burned up to the cap 9.

The disk 4 is provided with a boss 11 which fits into one end of a tube 12 whose other end is received in a recess 13 in the head 2.

The improved cap 14, which is shown in detail in Fig. 7, is set in a hole in the boss 11 and arranged so that when it is exploded it will ignite the end of the fuse 7. The head of the cap is provided with depressions 15 which extend almost through said head, leaving the thin, frangible portions 16 which are blown out when the cap is exploded, thereby permitting the gas resulting from the firing of the cap to blow into the interior of the tube 12, from which it escapes, as will appear hereinafter. The depressions 15 serve as spanner holes so that the cap may be screwed into the boss 11; it is provided with screw-threads 17 for that purpose.

The head 2 is provided with a nipple 18 which has a transverse hole 19 for the reception of a removable locking or safety pin 20, which is used for securing the firing

hammer in retracted position to prevent it from accidentally firing the cap at those times when the grenade is being shipped or handled. To condition the grenade for use in warfare, the pin 20 has to first be removed.

Slidable within the nipple 18 and through the head 2 and within the tube 12, is a firing hammer having a tubular stem 21 which is provided with an annular groove 22 to receive the pin 20. The hammer is provided with a head 23 having a point 24 adapted to strike the cap 14. Surrounding the stem 21 and located in the tube 12 between the head 23 and the head 2, is a coil spring 25 which is under compression when the firing hammer is in normal position so that when said hammer is released, it will be driven forward to cause the point 24 to strike the cap 14 and explode the latter.

The end of the nipple 18 is provided with a concavity 26. Extending transversely through the stem 21 is an aperture 27. Located in the aperture 27 and projecting into the concavity 26 is a pair of balls 28.

Telescoping over, and secured to, the nipple 18 is a tube 29 which is provided at its outer end with a bayonet slot 30. A knob or handle 31 is slidably received within the end of the tube 29 and has a pin or stud 32 adapted to play in the slot 30 and to be locked in the portion 30^a thereof. A firing pin 33 is slidable through a web or spider 34 extending across the tube 29, said pin being provided with a pointed end 35 which lies between the balls 28 and keeps them projected into the concavity 26, thereby locking the firing hammer in retracted position with the spring 25 under compression. Interposed between the cross-piece 34 and the knob or handle 31 is a coil spring 36 which is adapted to shift the knob 31 on the firing pin 33 until the knob is arrested by the head 37 on said firing pin.

Normally the pin 32 is in the off-set 30^a and the knob 31 is located inwardly in relation to the head 37; the end of the firing pin 33 is between the balls 28. Consequently the firing hammer is locked and the spring 25 under compression. Assuming, now, that the locking or safety pin 20 has been removed and it is desired to throw or drop the grenade, the knob 31 is turned to bring the pin 32 into the longitudinal portion of the bayonet slot 30. The spring 36 pushes the knob 31 slightly outwardly until the head 37 arrests the knob. The top of the firing pin 33 still remains interposed between the balls 28. The grenade is then ready for use. To throw or drop the grenade, the user grasps the tubular handle portion 29 with his hand resting against, or near, the knob 31. As soon as the hand is slid along the tube 29, the knob 31 is withdrawn and pulls with it the firing pin 33, whereupon the balls 28 drop to the interior of the stem 21. When this happens, the spring 25 instantly snaps the hammer to firing position, thus exploding the cap 14 and igniting the fuse 7. The knob 31 and firing pin 33 remain in the hand of the soldier, but the remaining portions of the grenade are thrown or dropped. The gas resulting from the explosion of the cap 14 passes by the head 23 and through the stem 21 into the tube 29, thence to the atmosphere. When the fuse 7 reaches the detonator 9, the grenade explodes.

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

1. A hand grenade comprising a body having an explosive charge and means for firing said charge, said means operating immediately on release, a member separable from the body adapted to be retained in the hand of the user, and means controlled by said member adapted for normally locking the firing means aforesaid, said firing means being automatically released for immediate firing action when the said member is detached from the body.

2. A hand grenade comprising a body having an explosive charge and means for firing said charge, a member separable from the body adapted to be retained in the hand of the user, a firing pin carried by said member, and a releasable locking device which is normally held in locking condition by said firing pin to thereby hold the firing means against action and is released to permit the firing means to act, when the member and firing pin become detached from the body.

3. A hand grenade comprising a body having an explosive charge, a slidable tubular spring-actuated firing hammer adapted for firing said charge, balls adapted for locking the firing hammer in retracted position, and a member arranged for detachable connection to the grenade, said member having a firing pin normally adapted to hold the balls in locking position, said balls being adapted to fall into the interior of the slidable tubular spring-actuated firing hammer, thereby releasing it, when the firing pin and its member are disconnected from the grenade.

4. A hand grenade comprising a body having an explosive charge, a slidable tubular spring-actuated firing hammer adapted for firing said charge, balls adapted for locking the firing hammer in retracted position, a tube carried by the grenade, said tube having a bayonet slot, a knob or handle having a pin received in the bayonet slot, a firing pin having a slidable connection with the knob or handle and provided with an end which coöperates with the balls to hold them in locked position to retain the firing hammer retracted, and spring means coöp-

erating with the knob to shift it in relation to the firing pin when the knob is disengaged from the tube, said knob and firing pin being adapted to be retained in the hand of the user when the grenade is thrown or dropped.

5. A hand grenade comprising a body having an explosive charge and provided with firing means and a handle portion, a knob having a detachable engagement with the handle portion and provided with a firing pin adapted to lock the firing means, said firing pin releasing the firing means when the knob is disconnected from the handle.

6. A hand grenade comprising a body provided with an explosive charge, firing means for exploding said charge, a locking device for securing the firing means against action, a handle portion for said grenade provided with a bayonet slot, a knob having a pin received in the bayonet slot, a firing pin loosely related to the knob and adapted to coperate with the locking means aforesaid, and spring means adapted to shift the knob in relation to the firing pin when the knob is turned to condition the parts for separation of the knob and firing pin from the grenade when the latter is thrown or dropped.

7. A hand grenade provided with an explosive charge and a cap for exploding said charge, said cap being provided with a frangible portion adapted to be blown out when the cap is exploded for the purpose of venting the gas from said cap.

8. A hand grenade comprising a body having an explosive charge and means for firing said charge, a member separable from the body adapted to be retained in the hand of the user, a safety locking device for said firing means, and means controlled by said member adapted for normally locking the firing means aforesaid, said firing means being automatically released when the said member is detached from the body.

In testimony whereof I hereunto affix my signature.

JOHN C. MILLER.