M. O. ANTHONY.

GRENADE.

APPLICATION FILED OCT. 7, 1918.

1,375,440. **Patented Apr. 19, 1921.**

Fig. 1.

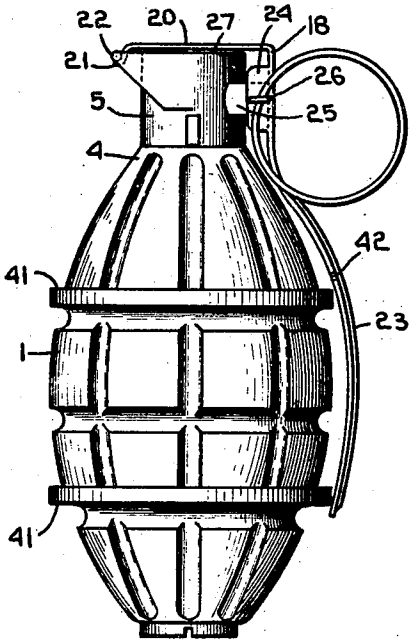


Fig. 2.

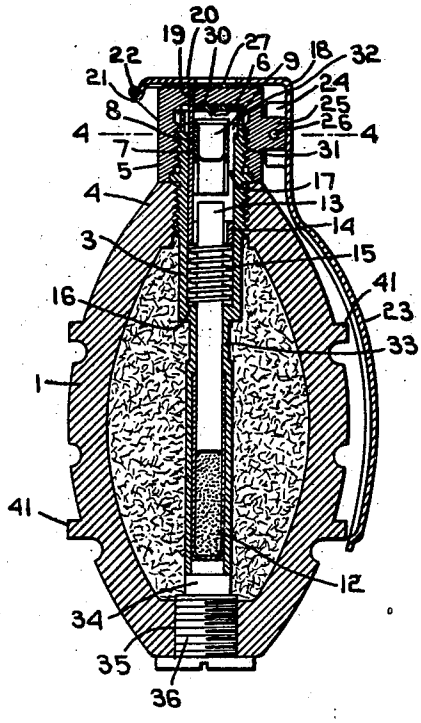


Fig. 3.

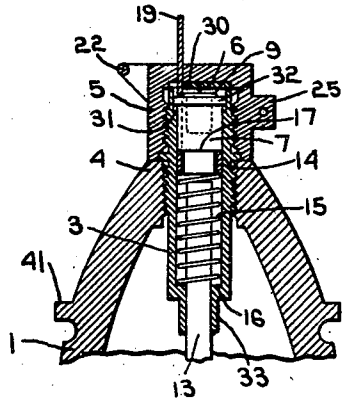
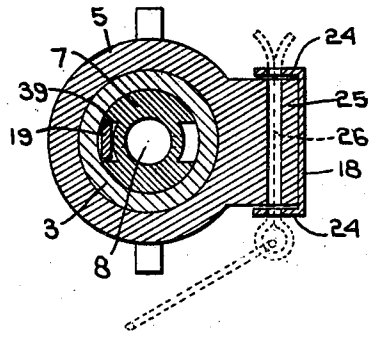


Fig. 4.



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UNITED STATES PATENT OFFICE.

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GRENADE.

1,375,440. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed October 7, 1918. Serial No. 257,101.

To all whom it may concern:

Be it known that I, MARCUS O. ANTHONY, a citizen of the United States, residing at New York, county of New York, State of New York, have invented an Improvement in Grenades, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to grenades, and has for its object to provide a novel grenade in which the firing pin is stationary and the grenade is fired by driving the primer against said stationary pin; to provide a grenade in which the hammer is held in its inoperative position by a thrust pin that is interposed between said hammer and the controlling lever or handle; to provide a novel firing mechanism which is compact and which can be removed from or placed in the grenade body as a unit and after it has been set, and otherwise to improve grenades all as will be more fully hereinafter set forth.

In order to give an understanding of my invention, I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Figure 1 is a side view of a grenade embodying the invention;

Fig. 2 is a sectional view;

Fig. 3 is a fragmentary sectional view similar to Fig. 2 but showing the holder in side elevation and the parts in the position they assume when the hammer is released, and

Fig. 4 is an enlarged section on the line 4—4, Fig. 2.

The grenade comprises a grenade body 1, which may have any suitable construction and is adapted to contain the explosive material 2, and the novel firing means which constitutes the principal feature of my invention. This firing means is of that type which comprises a primer which when exploded ignites a fuse leading to a detonator, a hammer for exploding the primer and a controlling lever or handle by which the operation of the hammer is controlled.

In my invention the operative parts of the firing mechanism are carried by a support which is detachably secured to the grenade body so that said firing mechanism can be assembled and set and then applied as a unit to the grenade body. Furthermore, in my firing mechanism the firing pin is stationary and the exploding of the primer is accomplished by driving it against the firing pin. This is provided for by supporting the primer in a movable holder and employing a spring-impelled hammer for driving the holder toward the firing pin, the operation of the hammer being controlled by the controlling lever or handle.

The support or carrier for the firing means is herein shown as a sleeve 3 which is screw-threaded through the neck 4 of the body 1. This sleeve projects beyond the body 1 and a head 5 is secured to the projecting end preferably by being screwed thereto. Said head is provided with a projection 6 which is situated at the outer end of the sleeve 3 and which forms a stationary firing pin, and in the illustrated embodiment of the invention said projection is formed on a steel plate 30 which is located within the head 5.

Loosely situated within the sleeve 3 is a holder 7 for a primer 9, said holder having a primer-receiving opening 8 in line with the firing pin 6 and in which the primer 9 is placed.

The sleeve 3 is provided near its end with a shoulder 31 and the holder 7 is formed with a flange 32 to rest on the shoulder, said holder being free to move in the sleeve toward the firing pin 6.

A time fuse 13 is situated within the sleeve 3 and is held in place by crimping the sleeve intermediate of its ends, as shown at 33. The inner end of the sleeve has an enlarged bore and receives a detonator 12 into which the fuse 13 leads. I will preferably construct the detonator so that after the fuse is crimped into the tube or sleeve 3, the detonator 12 can be placed in the lower end of the sleeve and slipped over the end of the fuse. A rubber plug 34 serves to hold the detonator in place.

A spring-impelled hammer is provided for driving the holder toward the firing pin thereby to force the primer against said pin when it is desired to operate the grenade.

The hammer for driving the holder 7 toward the firing pin may have any suitable construction. I have herein shown it as a

ring 14 which is slidably mounted in the sleeve 3 and is acted on by a spring 15 confined between the hammer and a shoulder 16 on the sleeve 3.

The spring 15 thus tends to force the hammer toward the holder, and said holder is provided with a shoulder 17 against which the hammer strikes when the latter is released. The striking of the hammer against the shoulder 17 will force the holder 7 toward the firing pin 6, thus bringing the primer 9 against said pin.

The hammer is normally held inoperative by a controlling lever or handle 18 which has approximately an L-shape and by a thrust pin 19 interposed between the handle and hammer and which is herein shown as integral with the hammer. The lever or handle 18 has a portion 20 which overlies the head 5 and is provided with a nose or beak 21 adapted to engage a loop 22 formed on said head and also another portion 23 shaped to conform to and overlie the side of the grenade body. Said handle is also provided with perforated ears 24 adapted to straddle an apertured projection 25 on the head, the construction being such that when the apertures in the ears and projection are in alinement a pin 26 may be inserted through the alined apertures thereby to retain the handle in its operative position. The pin 19 occupies a slot 39 formed in the holder 7 and extends through the head 5 and bears against the portion 20 of the handle 18, said pin operating to hold the hammer in its retracted position with the spring 15 compressed. 27 is a sheet of packing material such as leather or waxed paper which is interposed between the portion 20 of the handle 18 and the head 5 for the purpose of making a water-tight joint at the point where the pin 19 is located.

It will be noted that all the parts of the firing mechanism are carried by the support 3 so that the firing means can be removed from or applied to the body 1 as a unit.

In assembling the parts of the mechanism the fuse is first inserted into the sleeve 3 and the latter is crimped at 33 thereby to secure the fuse in place. The spring 15 and hammer 14 are then inserted into the sleeve and the holder 7 with the primer 9 therein is put in place. The handle 18 is then secured to the head 5, the water-proofing packing 27 having been inserted between the portion 20 of the handle and said head, and the head with the handle secured thereto is screwed to the outer end of the sleeve 3. This operation acts through the pin 19 to force the hammer 14 inwardly thereby compressing the spring 15. If the grenade is to be used immediately the detonator may then be placed in the lower end of the stem and the plug 34 inserted. This completes the firing mechanism which may then be screwed into the body 1 and the latter filled with the explosive charge 2 through an opening 35 in its lower end. A plug 36 closes the opening 35, said plug having such a size that when it is in place it engages the plug 34 so as to retain the latter in place.

It will be noted that the lower end of the sleeve 3 which contains the detonator is situated closely adjacent and in line with the opening 35 in the body. It will also be noted that the detonator is constructed so that it can be slipped into place in the lower end of the sleeve 3 after the fuse has been secured to the sleeve. The advantage of this construction is that the firing mechanism can be assembled, as above described, minus the detonator, and then said firing mechanism without the detonator can be secured to the body 1 and the latter can be supplied with its explosive charge 2. The rubber plug 34 will prevent the explosive charge from entering the lower end of the sleeve 3. The grenade thus prepared may then be shipped to the field of operations or stored, the detonators being shipped or stored separately. When it is desired to use the grenade, it is simply necessary to remove the two plugs 36 and 34, insert a detonator into the lower end of the sleeve 3 and then replace the plugs 34 and 36.

The grenade without the detonator is comparatively safe to handle and grenades thus prepared can be shipped in large quantities without danger. The detonators can also be readily shipped separately without particular danger, and the task of completing the grenades by inserting the detonator on the field of operations is a simple one.

In using the grenade, the operator places it in his hand with the handle 18 against the palm of his hand and then withdraws the pin 26. The grenade is then thrown and as soon as it leaves the operator's hand the expanding force of the spring 15 will throw the hammer forward, thus causing it to strike the shoulder 17 and drive the holder 7 toward the firing pin 6, such movement of the holder bringing the primer 9 against said firing pin with sufficient force to explode it. The exploding of the primer ignites the fuse 13 which in turn fires the detonator 12 and the latter explodes the main charge in the grenade.

Some hand grenades are provided with peripheral flanges 41 designed to fit the bore of a trench mortar so as to provide for firing said grenades from such a mortar. In order to adapt my improved grenade for such use, I propose to make the portion 23 of the handle with a transverse line of weakness 42 directly above the upper flange 41, so that when the grenade is to be used in a trench mortar, the handle may be broken along this line of weakness so that it can

be swung inwardly above the flange 41 thereby permitting the device to be loaded into the mortar. The bore of the mortar will serve to hold the handle in position until the grenade is thrown from the mortar.

I claim:

1. In a grenade, the combination with a grenade body, of a firing pin carried thereby, supporting means for a detonator and a fuse also carried thereby, a primer holder movable relative to said supporting means, and means normally held separated from the holder but adapted when released to strike the latter a hammer-like blow to drive it toward the firing pin thereby to cause the primer carried by said holder to be exploded against said pin.

2. In a grenade, the combination with a grenade body, of a firing pin, a sleeve carried by the body and adapted to sustain a fuse and a detonator, a primer holder movably carried by the sleeve, and a spring-impelled hammer normally separated from the holder and adapted when released to drive said holder toward the firing pin.

3. In a grenade, the combination with a grenade body, of a fixed firing pin carried thereby, a holder for a primer, and a spring-impelled hammer normally separated from the holder and adapted when released to drive the holder toward the firing pin.

4. In a grenade, the combination with a grenade body, of a firing pin carried thereby, a holder for a primer, and a spring-impelled hammer movable relative to the holder and adapted to drive the holder toward the firing pin.

5. In a grenade, the combination with a grenade body, of a sleeve extending through the wall thereof and constructed to hold a fuse and a detonator, a primer holder carried by the sleeve and movable relative both to the latter and to the fuse and detonator carried thereby, a firing pin, and means normally separated from the holder but adapted to strike the latter a hammer-like blow to drive it toward the firing pin.

6. In a grenade, the combination with a hollow grenade body, of a sleeve extending through the wall thereof, a firing pin stationarily carried by the sleeve, a holder for a primer situated within the sleeve, and a spring-impelled hammer adapted to strike the holder a hammer-like blow and drive it toward the firing pin.

7. In a grenade, the combination with a hollow grenade body, of a sleeve extending through the wall thereof, a head applied to the exterior end of the sleeve and provided with a firing pin, a holder for a primer slidable within the sleeve, and a spring-impelled hammer constructed to strike the holder a hammer-like blow and drive it toward the firing pin.

8. In a grenade, the combination with a hollow grenade body, of a sleeve extending through the wall thereof, a head applied to the exterior end of the sleeve and provided with a firing pin, a holder for a primer slidable within the sleeve, a spring-impelled hammer constructed to strike the holder a hammer-like blow and drive it toward the firing pin, a handle situated exterior to and releasably connected to the grenade body, and a thrust pin interposed between the handle and the hammer.

9. In a grenade, the combination with a hollow grenade body, of a firing pin stationarily carried thereby, a holder for a primer movable toward the pin, a spring-impelled hammer to drive the holder toward said firing pin, a handle situated exterior to the body, and a thrust pin interposed between said handle and hammer and normally holding the hammer separated from the holder.

10. In a grenade, the combination with a grenade body, of a firing pin, a holder for a primer, said holder and pin being movable in relation to each other, a spring-impelled hammer to drive the holder and pin toward each other, a handle situated exterior to the body, and a thrust pin interposed between the handle and hammer and operating to hold the hammer in its inoperative position separated from the holder.

11. In a grenade, the combination with a grenade body, of firing mechanism including a handle having a portion overlying the side of the grenade body, said portion being provided with a line of weakness whereby it may be broken transversely to permit the grenade to be inserted in a trench mortar.

12. In a grenade, the combination with a grenade body, of a firing pin, a sleeve carried by said body and adapted to sustain a fuse and a detonator, a primer holder movable relative to said sleeve, and a spring-impelled hammer slidably carried by the sleeve and adapted to drive the holder toward the firing pin.

13. In a grenade, the combination with a grenade body, of a firing pin, a holder for a primer, a spring-impelled hammer to drive the holder toward the firing pin, a handle releasably connected to the grenade body, and a thrust-pin interposed between the handle and hammer and operating to hold the hammer in its retracted position separated from the holder.

14. In a grenade, the combination with a grenade body, of a firing pin, a sleeve carried by said grenade body, a holder for a primer, a spring-impelled hammer situated within said sleeve and movable relative to both firing pin and holder and adapted to drive the holder and firing pin relatively toward each other thereby to explode the primer.

15. In a grenade, the combination with a grenade body, of a firing pin, a sleeve carried by said grenade body, a holder for a primer, a spring-impelled hammer situated within said sleeve and adapted to drive the holder and firing pin relatively to each other thereby to explode the primer, a handle releasably connected to the grenade body, and a thrust-pin interposed between the handle and hammer to hold the latter in its retracted position separated from the holder.

16. In a grenade, the combination with a grenade body, of a sleeve carried thereby and extending through the wall thereof, a head applied to the projecting end of said sleeve and making a water-tight connection therewith, a firing pin, a holder for a primer, a spring-impelled hammer adapted to produce a relative movement between the holder and firing pin thereby to explode a primer carried by the holder, a handle releasably connected to the grenade body and having a portion overlying the head, a thrust-pin extending through the head and interposed between said portion of the handle and the hammer to hold the latter in its retracted position.

17. In a grenade, the combination with a grenade body, of a sleeve carried thereby and extending through the wall thereof, a head applied to the projecting end of said sleeve and making a water-tight connection therewith, a firing pin, a holder for a primer, a spring-impelled hammer adapted to produce a relative movement between the holder and firing pin thereby to explode a primer carried by the holder, a handle releasably connected to the grenade body and having a portion overlying the head, a thrust-pin extending through the head and interposed between said portion of the handle and the hammer to hold the latter in its retracted position, and a water-tight packing interposed between said portion of the handle and said head.

18. In a grenade, the combination with a grenade body, of a sleeve extending through the wall thereof, a head applied to the exterior end of the sleeve, a firing pin, a holder for a primer, a spring-impelled hammer to cause relative movement between the holder and firing pin, a handle having a portion overlying the end of the head, means for releasably securing the handle to the grenade, and a thrust-pin extending through the head and interposed between said portion of the handle and the hammer.

In testimony whereof, I have signed my name to this specification.

MARCUS O. ANTHONY.