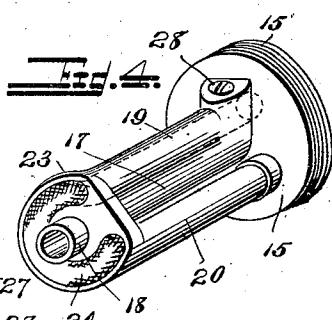
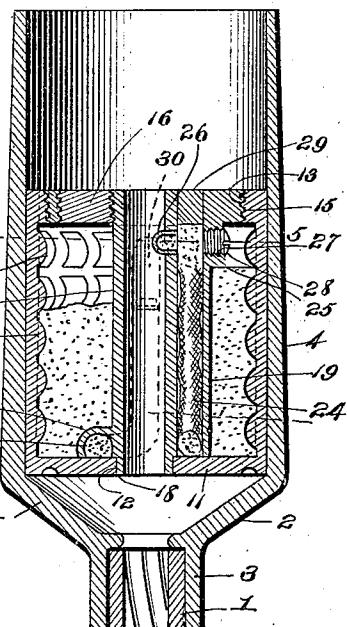
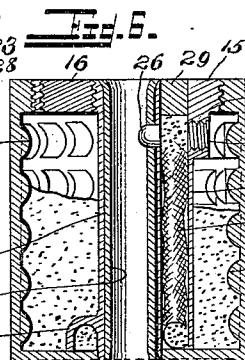
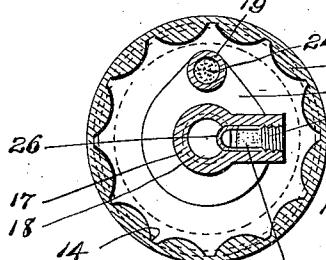
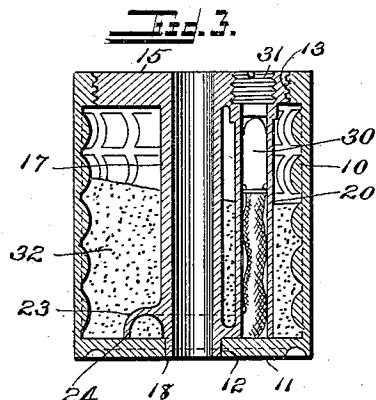
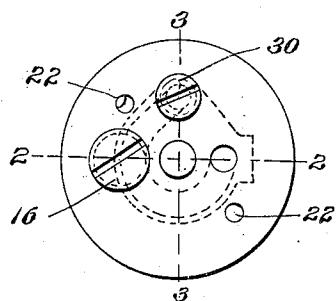


J. V. McADAM.
RIFLE GRENADE.
APPLICATION FILED SEPT. 20, 1918.

1,375,463.

Patented Apr. 19, 1921.



Inventor

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UNITED STATES PATENT OFFICE.

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RIFLE-GRENADE.

1,375,463.

Specification of Letters Patent. Patented Apr. 19, 1921.

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To all whom it may concern:

Be it known that I, JOHN V. MCADAM, major, Ordnance Department, the U. S. Army, a citizen of the United States, stationed at Washington, D. C., in the office of the Chief of Ordnance, have invented Improvements in Rifle-Grenades, of which the following is a specification.

The invention described herein may be used by the Government, or any of its officers or employees in prosecution of work for the Government, or by any other person in the United States, without the payment of any royalty thereon.

This invention relates to the improvement of rifle grenades of the type shown in British Patent 100,700, Viven and Bessiere, in which the bullet from the rifle passes through an aperture in the grenade. This type of grenade may be used with ordinary rifle ammunition.

It is one object of my invention to reduce the number of parts required, so that the grenade can be easily and cheaply constructed and therefore readily and quickly made in large quantities.

Another object is to provide a grenade which may be readily disassembled so that access may readily be had to the interior parts.

A further object is to provide a grenade of this type in which a standard small arms or other suitable primer may be used to discharge the grenade upon reaching its objective.

Another object is to provide a grenade in which the primer may be placed on the inside. In this way the primer is protected from inadvertent blows and the grenade is therefore safer to handle and may be more easily packed for shipment.

Other objects are to provide a grenade in which the primer may be struck by the rifle bullet itself or otherwise set off so that all intervening hammers, striking wings, and the like may be omitted and to provide a construction wherein the fuse may be proportionately much longer, so that less powder may be used. This will permit of much more accurate timing than where a short fuse must be used.

Another object of my invention is to provide a grenade in which the detonator can be inserted or removed without disassem-

bling the grenade. This will permit the removal of the detonator before shipping so that grenades of this type may be safely and conveniently transported, and the detonator applied thereto in the field.

Another object is to provide a grenade which may be inserted into the discharger with either end up. The foregoing objects are attained by a grenade embodying my invention, one form of which is shown in the annexed drawings, wherein;

Figure 1 is a plan view of the grenade removed from the discharger,

Fig. 2, a sectional view taken on the line 2—2 of Fig. 1 looking in the direction of the arrows and showing the grenade in position in the discharger,

Fig. 3, a sectional view of the grenade, taken on the line 3—3 of Fig. 1 looking in the direction of the arrows,

Fig. 4, a perspective view of the inside casting of the grenade,

Fig. 5, a horizontal sectional view taken on the line 5—5 of Fig. 2, with the detonator removed, and

Fig. 6, a vertical sectional view of a slightly modified form.

Referring to Fig. 2, a grenade discharger 2 comprising a grenade holding portion 4 and a rifle engaging portion or sleeve 3 may be attached to the muzzle end of a rifle 1, by any suitable fastening means. The upper part of the discharger which receives the grenade controls its direction of flight and the parts 3 and 4 are connected by a conical wall, 5.

The grenade shown in the drawing comprises a cup-shaped outer casing composed of the cylindrical wall 10 and preferably a flat bottom wall, 11, provided with a central aperture and an inside casing which also includes means for closing the outer casing. The upper part of the wall 10 may be provided with an inwardly extending flange, threaded as at 13. The casing walls preferably are provided with depressions 14 extending longitudinally and circumferentially to permit the casing to break into fragments of the proper size and weight when the grenade explodes.

The inside casing consists of an end wall 15 provided with threads 15' to engage with the threads 13, and three longitudinal tubes 17, 19 and 20 preferably cast integral there-

with. The end wall 15 is provided with a filling opening which may be closed by a screw plug 16. Holes 22 or other means may be provided to receive a wrench for assembling the grenade. The tube 17, or discharge tube, is aligned with the bore of the barrel and is slightly larger in diameter. The tubes 19 and 20 may be of any size suitable to receive a standard commercial fuse. 10 The lower ends of these tubes are connected by a passageway or channel 23, the open side of which is closed by the wall 11 when the grenade is assembled. The fuse 24 lies in this channel, its ends extending into the tubes 19 and 20. The tubes 19 and 20 and the channel 23 therefore form a conduit for the fuse. The wall common to the tubes 17 and 19 is provided with an aperture near its upper end, which is adapted to receive a standard small arms ammunition primer 26 or other suitable means for igniting a fuse train. This is inserted through an aperture 27 in the opposite wall, which is afterward closed by the screw plug 28. The space 20 above the fuse may be filled with powder, 25, to a point slightly above the primer or the primer may ignite the fuse directly. The remainder of the tube is then sealed with any suitable sealing substance, such as paraffin 29. The other end of the fuse is provided with a detonator or blasting cap 30. After the detonator has been inserted in the tube 20 it may be closed by any suitable closure such as the screw plug 31.

35 The inside portion shown in Fig. 4 may be made of any suitable material preferably zinc or an alloy containing a high percentage of zinc. This metal has no great strength and, therefore, in order to permit 40 of the tube 17 being sufficiently strong to resist bursting, without exceeding the desirable dimensions it may sometimes be desirable to reinforce the tube 17 by means of a steel reinforcing tube such as is shown at 17' in Fig. 6. This tube may be inserted into the finished tube 17 and fastened in any desired way or it may be originally cast into said tube, *i. e.*, the steel tube may be placed in the mold and the casting molded around 45 the tube.

The operation of the grenade is as follows: The discharger 2 is attached to the rifle barrel, and the grenade slipped into the discharger. The rifle is then held at the 55 proper angle and discharged. The rifle bullet will pass through the tube 17 and continue in its flight. The friction of the bullet in passing through the tube and the pressure of the gases behind the grenade will force 60 the grenade out of the discharger with velocity sufficient to carry it to its objective. The discharge of the piece has also exploded the primer 26, which has ignited the powder which ignited the fuse 24. The fuse is consumed until the sparks reach the detonator

30 which explodes, disrupting the tube 20 and exploding the charge of high explosive 32 with which the grenade is filled.

It will be noted also that in my grenade the fuse may be two or three times as long 70 as in heretofore known grenades of this type. By the use of a long fuse the necessary time interval can be more accurately determined than by the use of a long train of powder. Since powder under compression 75 does not burn uniformly, particularly when unevenly packed, it is desirable to use as little as possible and in some cases, none at all for accurate results. In this way I have provided a grenade which may be more accurately timed than others of this type. 80

It will also be noted that by my construction the detonator is contained in a tube which may be open to the exterior and, when the plug 31 is unscrewed, the detonator may 85 be readily removed thus rendering the grenade inert and safe to handle and the detonator may be replaced without disturbing the main explosive charge of the grenade. This could evidently not be done if the detonator were in direct contact with the explosive. This feature, in common with several others, is of general application and not necessarily limited to use with the other features illustrated. 95

A grenade of this type may be slipped into the discharger with either end up as the primer will function equally well in either position of the grenade although the interval of time between discharge and detonation will be different for the different positions. 100

From the foregoing description and specification it will be seen that I have provided a grenade which has accomplished the objects heretofore stated, in a very desirable way. It is obvious, also, that my invention is not limited to the specific forms shown but that many modifications may be made without exceeding the scope of the invention set 110 forth in the annexed claims.

I claim—

1. A rifle grenade comprising an outer casing, a removable closure therefor, two fuse tubes and a bullet tube carried by said 115 closure and a passageway connecting the ends of the fuse tubes, one side of which is open to facilitate the insertion of the fuse into its tubes, the parts being so arranged and proportioned that the outer casing will 120 form a closure for the open side of the connecting passage.

2. A rifle grenade of the class described comprising a cup-shaped outer casing, a removable closure therefor, two fuse tubes 125 and a discharge tube carried by said closure and means forming a passageway connecting the ends of the fuse tubes, one side of which is open to facilitate the insertion of the fuse into its tubes, the parts being so 130

arranged and proportioned that the bottom of the cup-shaped outer casing will form a closure for the open side of the connecting passage.

5 3. In a grenade, an explosive receiving container, a substantially U shaped fuse conduit in said container communicating with the exterior at each end, a fuse in said conduit, a detonator at one end of said fuse and means to close the end of the conduit nearest the detonator.

4. In a grenade, an explosive receiving container, a substantially U shaped fuse conduit in said container communicating with the exterior at each end, a fuse in said conduit, a detonator at one end of said fuse, igniting means comprising a primer adjacent the other end of the fuse and a closure for each end of the conduit.

20 5. In a rifle grenade, the combination with a discharger adapted to fit the muzzle of a rifle, a grenade constructed to fit said discharger and having a closed and open end, a removable closure fitting the open end, 25 and a projectile guide and fuse holder carried by said removable closure.

6. In a rifle grenade, the combination with a smooth bore discharger adapted to fit the muzzle of a rifle, a grenade having an outer 30 smooth surface to snugly fit said discharger and having its inner surface formed with ridges and depressions to cause the grenade to shatter into fragments, a removable closure fitting said grenade, a projectile guide means carried by said cover and fitting in the closed end of the grenade, a fuse holder carried by said closure, a fuse fitting in said holder, a detonator connected with said fuse, and a fuse igniting means mounted in the fuse holder and extending into the projectile guide to be operated by engagement of the projectile.

7. A rifle grenade having a closed wall provided with an aperture, and having an 45 open end, a detachable closure fitting in said open end, and having an opening therein, a projectile guide having its ends mounted in the aperture of the grenade and in the open-

ing in said closure, a fuse holder connected with the closure and arranged contiguously to the projectile guide, a fuse in said holder, a detonator in communication with one terminal of said fuse holder, a bullet impact igniting device disposed in the projectile guide and fuse holder and leading from the other terminal of said fuse.

8. A rifle grenade having a closed end and an open end, a removable closure fitting said open end, a projectile guide having its ends mounted in said closure and the closed end of the grenade, a fuse holder of serpentine form carried by the closure and disposed adjacent said projectile guide, a fuse in said serpentine holder, a detonator in communication with one end of said fuse, a fuse igniting means disposed adjacent the other end of said fuse, and a bullet impact primer to be engaged by the projectile for lighting said fuse.

9. A rifle grenade having a closed end and an open end, a detachable closure mounted in said open end, a bullet guide disposed in the closure and the closed end of the grenade, and a fuse holder of substantially serpentine form carried by said closure and arranged contiguously to said bullet guide.

10. A rifle grenade consisting of a casing adapted to fit a discharger and having an open end, a detachable closure for said open end, and a projectile guide and fuse holder mounted in and carried bodily by said closure.

11. A rifle grenade comprising a casing, a removable closure therefor, two fuse tubes and a discharge tube carried by said closure and a passage-way connecting the exposed ends of the fuse tubes to facilitate the insertion of the fuse into said tubes, said passage-way when the parts are in position for service being closed by the bottom of said casing.

In witness whereof I have attached my signature this 29 day of August, 1918.

JOHN V. McADAM.