H. KNIGHT.

SENSITIVE IGNITION DEVICE.

APPLICATION FILED JUNE 1, 1918.

1,333,496.

Patented Mar. 9, 1920.

2 SHEETS—SHEET 1.

FIG. 1.

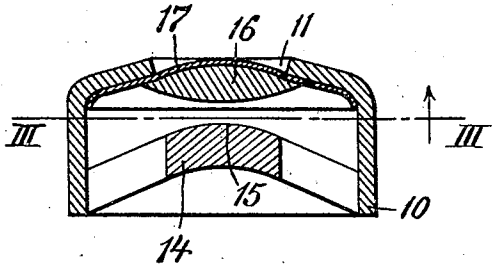


FIG. 2.

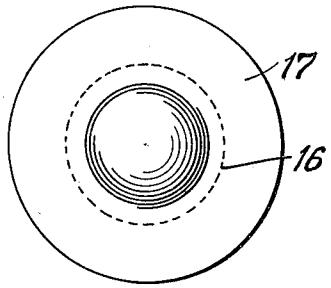


FIG. 3.

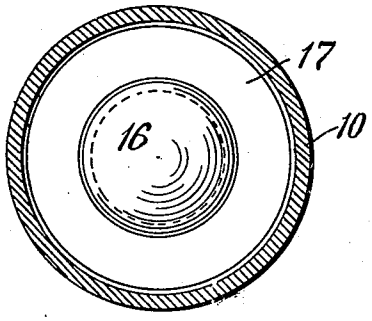


FIG. 5.

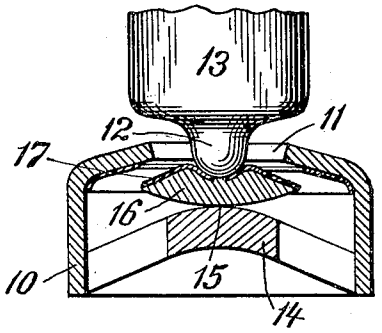


FIG. 4.

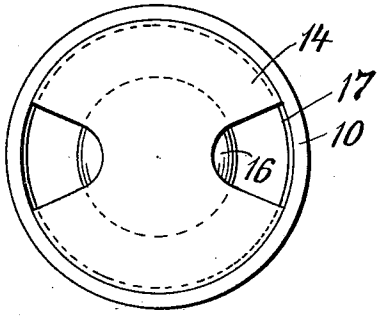
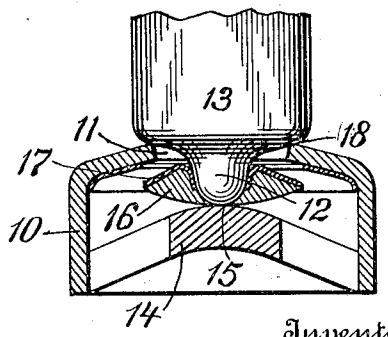


FIG. 6.



Inventor

Herbert Knight

H. KNIGHT.

SENSITIVE IGNITION DEVICE.

APPLICATION FILED JUNE 1, 1918.

1,333,496.

Patented Mar. 9, 1920.

2 SHEETS—SHEET 2.

FIG. 7.

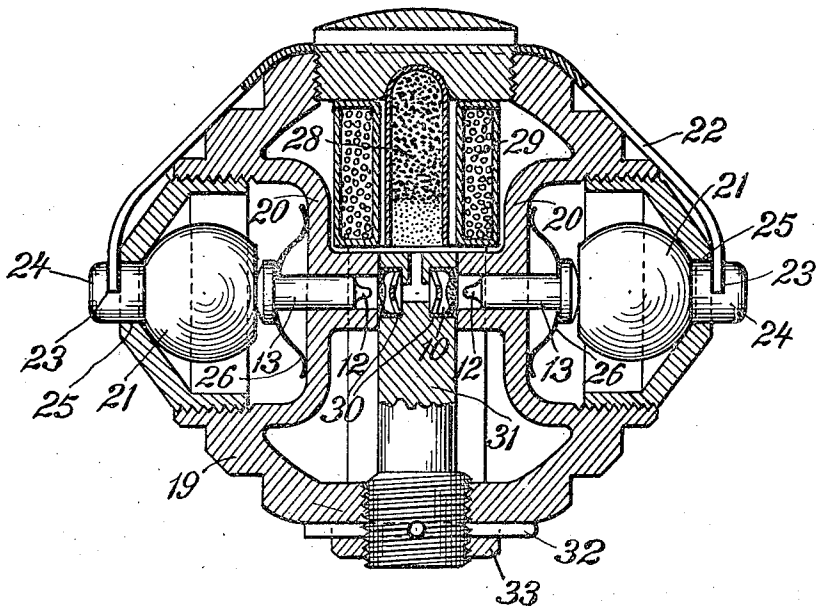
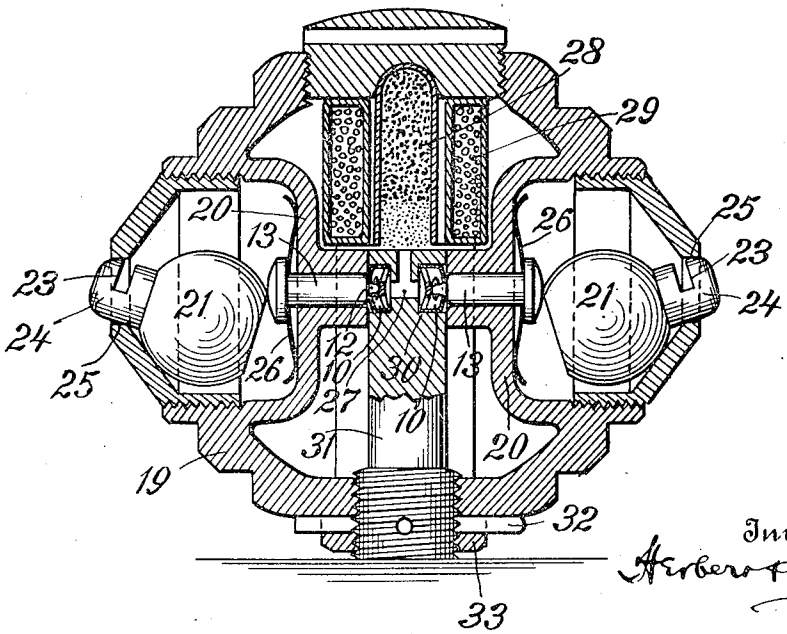


FIG. 8.



Inventor

Herbert Knight

UNITED STATES PATENT OFFICE.

HERBERT KNIGHT, OF NEW YORK, N. Y., ASSIGNOR TO INTERNATIONAL MUNITIONS COMPANY INC., OF DELAWARE.

SENSITIVE IGNITION DEVICE.

1,333,496. Specification of Letters Patent. Patented Mar. 9, 1920.

Application filed June 1, 1918. Serial No. 237,781.

To all whom it may concern:

Be it known that I, HERBERT KNIGHT, a citizen of the United States of America, and residing in the borough of Manhattan, city of New York, county and State of New York, have invented a new and useful Sensitive Ignition Device, of which the following is a specification.

My improved ignition device, such as shown, described and claimed in this application for Letters Patent of the United States, refers to, and embraces, means for rendering such an implement extremely sensitive; the object of providing this great sensitiveness is to afford penetrable access for a firing pin which responds to a very slight blow: this improvement as I have developed it has been addressed more especially to employment in hand grenades, but it can also be used in bombs, shells and other forms of projectiles when and where a very responsive initiating firing member is required; in effect my invention is a cap or primer of a very sensitive nature.

Referring to the accompanying drawings, which form a part of this specification:

Figure 1— represents a vertical section of my improved ignition device.

Fig. 2—is a top view of same.

Fig. 3—is a cross section of the implement on the line III—III looking in the direction of the arrow.

Fig. 4— is a bottom view of same.

Fig. 5— is a vertical section showing the firing pin in the act of functioning.

Fig. 6— is a similar view to Fig. 5 with the operation farther advanced.

Fig. 7— shows a hand grenade embodying my invention.

Fig. 8— is a similar view showing the igniting device functioning.

Figs. 1 to 6 of these views, it will be understood show the instrument to a greatly enlarged scale; Figs. 7 and 8 show the device slightly enlarged.

In these drawings 10 is a cup piece, or cap, having a centrally located opening 11 in its crown. The object of cutting away the crown at this point is to provide access for the tip 12 of the firing pin 13; by referring to Fig. 5 of the drawings, it will be seen that the firing pin has in the act and process of operation actually passed beyond the upper face of the cup, that is to say, the crown, without coming in contact therewith.

Positioned inside of the cup or cap 10 is the anvil plate 14 crowning upward toward the center at 15, and placed above this central crown 15 and spaced from it is the fulminate ignition device, or firing element 16.

This element 16 is secured to the under surface of a thin film-like member 17 formed preferably of tin foil; this film 17 is sensitive, and, considering its position and attributes, a super-sensitive member of my organization; it will be seen that while it discharges the office of a covering for the upper surface of the fulminate, it also serves as a means for securing the fulminate to the structure; these are its minor offices.

The principal object of the film is to provide easy penetration for the firing pin, so that when a light blow is delivered, it will function the fulminate; in some classes of munitions, and particularly in the device which I will show herein as employing and embodying it, such a proposition is of great practical value.

When the device is in the act of operating, that is to say, when the firing pin 13 is moving toward the opening of the cap and is brought into position to deliver a blow upon the fulminate 16, through the supersensitive film 17, it drives this combined structure down and forces it to the anvil plate 14, as shown in Fig. 6; at which time the shoulders 18 of the firing pin may reach the edges of the central opening 11 of cap 10; when the point of the firing pin reaches the anvil plate the fulminate functions, but as will be seen its path and travel has been made easy by the peculiar construction aforesaid.

I have shown in Fig. 7, one means and method of practically applying this invention and in this figure I illustrate it in connection with a hand grenade. This grenade consists of a body or envelop 19 having cups or pockets 20, one on each side. The firing pins here are shown at 13 and are two in number. They are adapted to move toward each other and in the direction of the center of the grenade, their points 12 being positioned to function with the primer or supersensitive igniting device, as disclosed in reference to Figs. 1–6.

At 21 I show two gravity operating balls

held to a safety position by a spoon or stripper 22, the outer ends of the said stripper entering in slots 23 of the terminals 24 of said gravity balls, which latter terminals extend through suitable openings of the pocket covers 25 of the grenade envelop 19.

When the stripper 22 is pulled off in the act of throwing the grenade, the gravity balls 21, being released, are adapted to function and this act will occur when the implement impacts. The balls 21 will thereupon tumble and will drive the firing pins inwardly as shown in Fig. 8 and will cause the small copper stirrups 26 to collapse; the sensitive primers or igniting devices will then be pierced and the implement will function and the fire from the primers will enter the port 27 and be directed against the detonating element 28, which will respond thereto, and which will in turn function the battle charge 29.

The primers, or sensitive igniting devices, are inserted in suitable pockets 30 of a plug 31, which plug is secured in position by the pin 32 positioned in a suitable opening through the shoulder 33 and the outer end of said plug and by means of this structure, said plug can be given a quarter turn by the removal of the pin 32, turning the plug and reinserting it, in the meantime having thrown the sensitive primers to a safety position or an armed position as may be desired: as shown in Figs. 7 and 8, the plug is presenting the primers to an armed position, but by giving the plug a quarter turn as has been explained, the sensitive primer will be put in a safe position.

The point and principle which I desire to bring out and emphasize in the foregoing is that I have disclosed and provided an initiating element in a firing device for munitions of extreme sensitiveness, which will respond to the often very slight blow given it.

My present invention is illustrated herein as employed in connection with grenades, but I do not limit its employment in this respect as it can be utilized, as herein before stated, in any form of munition where a very responsive initiating firing member is required.

Having thus described my invention, the following is what I claim as new and useful therein and desire to secure by Letters Patent:

1. A primer for grenades comprising a cup having its bottom full thickness of the metal and provided with a central hole, a relatively thin retaining sheet in the bottom of the cup and covering the hole, an anvil, and detonating mixture between the anvil and the retaining sheet.

2. A primer for grenades comprising a cup having sides and bottom of substantially uniform thickness, the bottom being provided with a hole, a sheet of foil in the bottom of the cup covering the hole, a detonating mixture, and an anvil.

3. In a primer for grenades, the combination with a cup having a central hole in its bottom and a retaining sheet made of material thinner than said bottom, located in the bottom of the cup and covering the hole, of detonating mixture and an anvil.

HERBERT KNIGHT.