M. C. MAUNSELL.

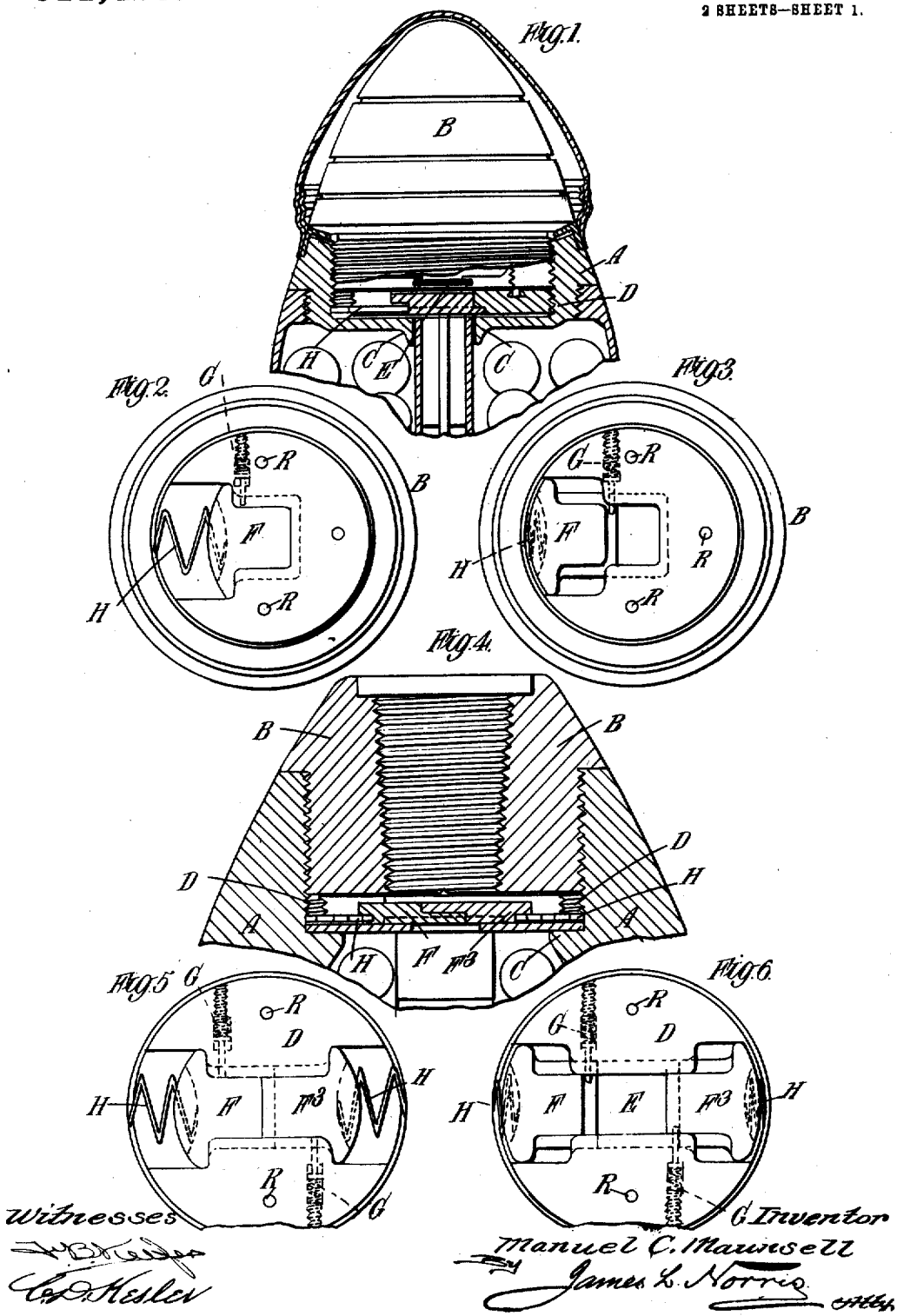
EXPLOSIVE PROJECTILE.

APPLICATION FILED OCT. 22, 1906.

**911,420.**

Patented Feb. 2, 1909.

2 SHEETS—SHEET 1.




Witnesses

C. D. Kesler

Inventor

Manuel C. Maunsell

By James L. Norris

Atty.

M. C. MAUNSELL.

EXPLOSIVE PROJECTILE.

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Fig. 7.

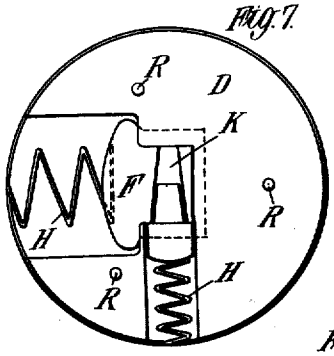



Fig. 8.

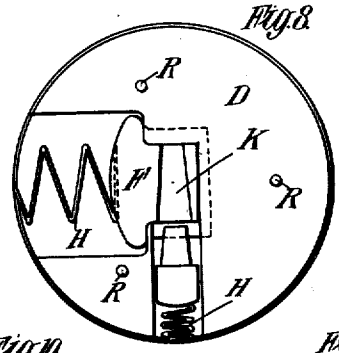



Fig. 9.

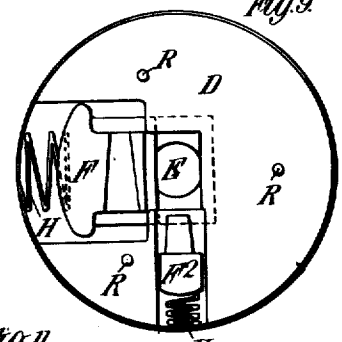



Fig. 10.

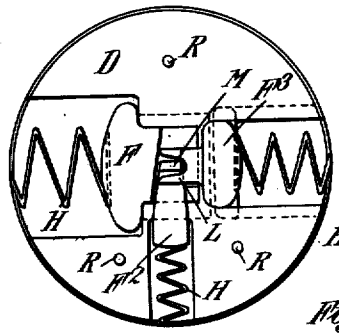



Fig. 11.

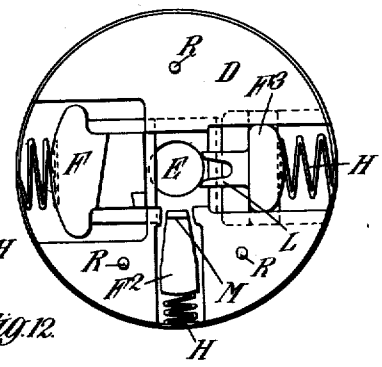



Fig. 12.

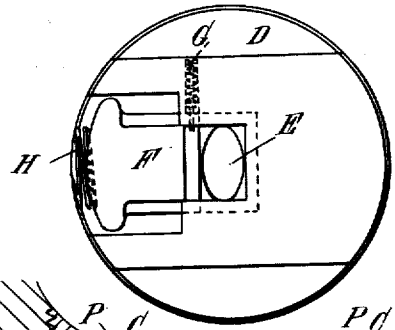
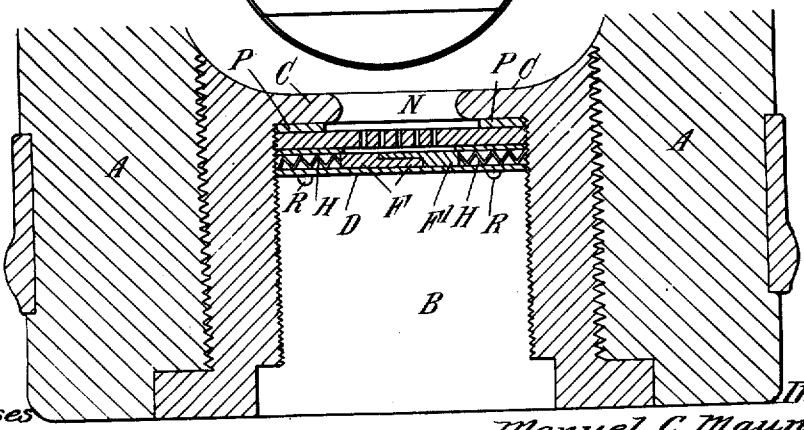



Fig. 13.




Witnesses

J. B. Keeler

Chas. Keeler

Inventor

Manuel C. Maunsell

By James L. Norris

Atty.

# UNITED STATES PATENT OFFICE.

MANUEL CHARLES MAUNSELL, OF WESTMINSTER, LONDON, ENGLAND.

## EXPLOSIVE PROJECTILE.

No. 911,420. Specification of Letters Patent. Patented Feb. 2, 1909.

Application filed October 22, 1906. Serial No. 340,069.

*To all whom it may concern:*

Be it known that I, MANUEL CHARLES MAUNSELL, a subject of the King of Great Britain, residing at 32 Victoria street, Westminster, in the county of London, England, late major Royal Artillery, have invented certain new and useful Improvements Relating to Explosive Projectiles, of which the following is a specification.

This invention relates to explosive projectiles or shells of the kind in which is provided a safety device for preventing the flash of the fuse from reaching the bursting charge of the shell, until said shell has been fired from a gun and subjected to the action of centrifugal force due to its rotation in its flight.

In projectiles as heretofore constructed the fuse, or the part thereof containing the priming charge, has been retained in a safety chamber in the base of the projectile and cut off from the direct communication with the bursting charge by sliding or pivoted barriers which are removed by centrifugal force only after the projectile has left the gun, and may be held in open position by spring bolts or other suitable means, so that on impact the fuse may be projected forwards into the bursting charge and ignited.

According to my invention the safety fuse chamber is dispensed with so that a base or nose fuse, screwed into the projectile in the usual manner may be employed.

The safety device is situated between the screwed in fuse and the passage leading to the bursting charge of the shell, so that when the aforesaid sliding piece is in its closed position this passage is masked and the flash due to any premature or unintentional discharge of the fuse prevented from passing the safety device and reaching the bursting charge. When however the shell is fired from a gun, the spin it receives from the rifling, causes the centrifugal force to move the sliding piece as is well understood into its open position where it is held by the said retaining bolt so that in the firing of the fuse the flash is able to reach the bursting charge of the shell.

The aforesaid safety device will also add to the security against explosion of unfused shells when in store, as well as during the unplugging or plugging operations, by preventing unexpected or temporary flame or flash from igniting the bursting charge.

Obviously the safety device is applicable to shells having their fuses arranged at the nose or at the base.

In order that the said invention may be clearly understood and readily carried into effect, I will now proceed to describe the same more fully with reference to the accompanying drawings, in which:—

Figure 1 is a vertical section of the nose or forward portion of a projectile provided with one form of my safety device. Fig. 2 is a plan of the said safety device with the parts in the position they occupy, before the projectile has been fired from the gun, and Fig. 3 is a similar view with the parts in the position they occupy after the projectile has been fired from the gun. Fig. 4 is a vertical sectional view of the nose of a projectile, provided with a modified form of my safety device. Fig. 5 is a plan view of the said modified device before firing, and Fig. 6 is a similar view of the same after firing. Figs. 7, 8, 9, 10, 11 and 12 are plan views of further modified forms of my safety device, and, Fig. 13 is a vertical section showing the application of my safety device to the base of a projectile.

Like letters of reference indicate similar parts in all the figures.

A is the projectile. B the fuse and adapter for same.

C are projections or wings on the inner walls of the projectile.

D is the plate or disk forming part of my safety device and provided with the opening E.

F is the eccentrically arranged movable piece, normally covering said opening E and adapted to slide transversely or radially with respect to the axis of the projectile in grooves or flanged guides in said disk.

G is the spring controlled catch, H is a spiral or other spring for maintaining said sliding piece in the closed or normal positions.

Referring to Figs. 1 and 2, before the projectile is fired from the gun, the movable piece F is maintained in its closed position, that is to say in a position to close or mask the hole or opening E, thereby preventing communication between the fuse and the bursting charge. Upon firing the projectile, and as soon as the same has acquired the requisite spin or rotation after leaving the gun the said movable piece F assumes the position shown in Fig. 3, and is prevented from returning to its closed position, by means of the catch G which in the example shown is

in the form of a pin subject to the action of a spring which operates to push said pin inward in front of the movable piece when the latter assumes its retracted or outward position. The opening E is then open and fully exposed so that when the flash from the fuse occurs it can pass to the bursting charge and explode the same in the ordinary manner.

In Figs. 4, 5 and 6 a similar safety device is shown with the exception that two movable pieces F, $F^3$ are provided, said movable pieces overlapping each other at their inner ends in their closed position and moving apart in opposite directions when subjected to the action of centrifugal force.

As an additional security to my safety device and in order to meet the improbable event of a projectile even when fitted with the above device prematurely bursting within a short distance of its leaving the muzzle of the gun, if not actually within the gun, if a very sensitive fuse be employed, I construct the safety device in the manner illustrated by Figs. 7, 8 and 9. In this case the disk D is provided with two movable pieces F and $F^2$ arranged to operate at right angles to each other, or at any other convenient angle. The piece F is provided with a coned recess K in which is adapted to slide the piece $F^2$ which so long as it is in engagement with the piece F prevents the latter from movement. When the projectile has been fired and has acquired the requisite spin or rotation the piece $F^2$ slides outwardly under the action of centrifugal force thereby releasing the piece F which immediately slides outwardly as before, leaving the opening E free. In this instance however the time occupied to uncover said opening is greater than in the previous case and thus the projectile cannot explode until it has reached a considerably further distance from the gun.

If it be required to provide for a still greater distance of travel of the projectile from the muzzle of the gun before uncovering the opening E, I may provide the disk or plate D with three sliding pieces F, $F^2$ and $F^3$, as shown in Figs. 10 and 11. In this case the piece $F^3$ is forked at L and normally engages with a lug M on the piece $F^2$ thereby preventing the same from moving outwards, and consequently also preventing the piece F from moving outwards. After the projectile has been fired from the gun, the three pieces move outwards in the following order:—First the piece $F^3$ moves thereby releasing the piece $F^2$, secondly the piece $F^2$ moves outwards and thereby releases the piece F, and thirdly the piece F moves, thereby uncovering the aperture E. In this case a still greater length of time is occupied to uncover the opening E than in the other cases referred to above.

In those devices illustrated in Figs. 7 to 11 it will be noted that the pin or catch G is dispensed with. I am enabled to dispense with the same, by constructing the movable pieces and guides with square corners and allowing such space externally to such guides that the movable pieces when not engaging said guides, have free angular motion; so that it is highly improbable that they would reëngage said guides and slide forward to cover said opening E when the movable pieces are no longer subjected to the action of centrifugal force.

Fig. 12 shows a further modification of my safety device in which the opening E is elliptic and eccentric, thereby enabling a shorter movable piece to be utilized and insuring efficient centrifugal action.

Fig. 13 shows my safety device adapted for use in a projectile fitted with a base fuse. In this case the disk D and its movable pieces are protected from the shock caused, in firing the gun, by the setting back of the bursting charge, by a perforated plate N of steel or other suitable metal, protected on each side by suitable pads or washers P of leather or other convenient substance. The operation of the device is similar to the previously described instances, the flash of the fuse, when the opening E is exposed being communicated to the bursting charge through the apertures in the plate N.

R are lugs or projections on the disk D, consisting of small pieces of lead or other material placed on the disk to compensate for errors of manufacture, and are employed for the purpose of insuring a good fit between the projections C and the fuse adapter B and to prevent looseness of the disk when in its position in the projectile.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of means situated between the screwed in fuse and the bursting charge for preventing the same from accidental ignition, said means being independent of the projectile and bodily removable therefrom.

2. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a perforate disk located between the fuse and the bursting charge, means for closing said perforation, means for maintaining said perforation closed prior to the discharge of the projectile from the gun, and means for maintaining said perforation open, after the discharge of the projectile, said disk and said means independent of the projectile and removable therefrom simultaneously.

3. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a perforate disk located between the fuse and the burst-

ing charge, an eccentrically arranged centrifugally sliding piece for normally closing said perforation, means for maintaining said perforation closed prior to the discharge of the projectile from the gun, and means for maintaining said perforation open after the discharge of the projectile, said disk, sliding piece and means independent of the projectile and removable therefrom simultaneously.

4. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a perforate disk located between the fuse and the bursting charge, an eccentrically arranged centrifugally sliding piece for normally closing said perforation, a spring for maintaining said sliding piece in its closed position before the discharge of the projectile from the gun, and means for maintaining said perforation open after the discharge of the gun, said disk, sliding piece and means independent of the projectile and simultaneously removable therefrom.

5. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a perforated disk located between the fuse and the bursting charge, an eccentrically arranged centrifugally sliding piece for normally closing said perforation, a spring for maintaining said sliding piece in its closed position before the discharge of the projectile from the gun, and a spring controlled pin and abutments for preventing the return of said sliding piece to its normal position and maintaining the said perforation open after the discharge of the projectile, said disk, sliding piece, spring, spring-controlled pin and abutments independent of the projectile and simultaneously removable therefrom.

6. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a disk located between the fuse and the bursting charge, an eccentrically arranged centrifugally sliding piece, and means for delaying the sliding of said piece after the discharge of the projectile from the gun, said disk, sliding piece and means independent of the projectile and simultaneously removable therefrom.

7. In an explosive projectile the combination with the screwed in fuse and the passage leading to the bursting charge, of a disk located between the fuse and the bursting charge, an eccentrically arranged centrifugally sliding piece, and a plurality of eccentrically arranged centrifugally sliding pieces for delaying the sliding of said first mentioned piece, said disk and sliding pieces independent of the projectile and simultaneously removable therefrom.

In testimony whereof I affix my signature in presence of two witnesses.

MANUEL CHARLES MAUNSELL.

Witnesses:
HENRY KING,
S. J. READ.