R. L. WRIGHT.

PROJECTILE.

APPLICATION FILED APR. 17, 1920.

1,374,705.

Patented Apr. 12, 1921.

2 SHEETS—SHEET 1.

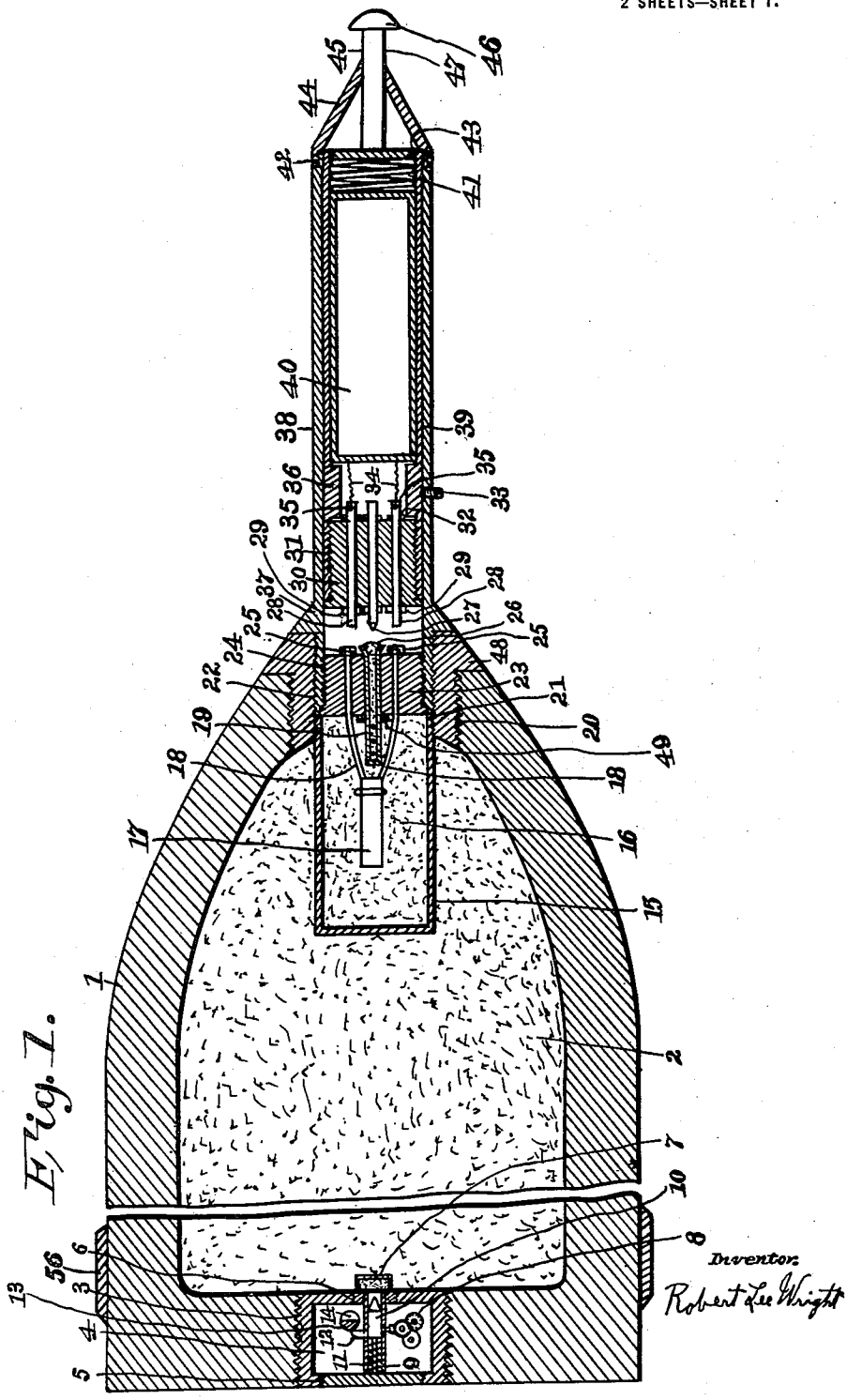


Fig. 1.

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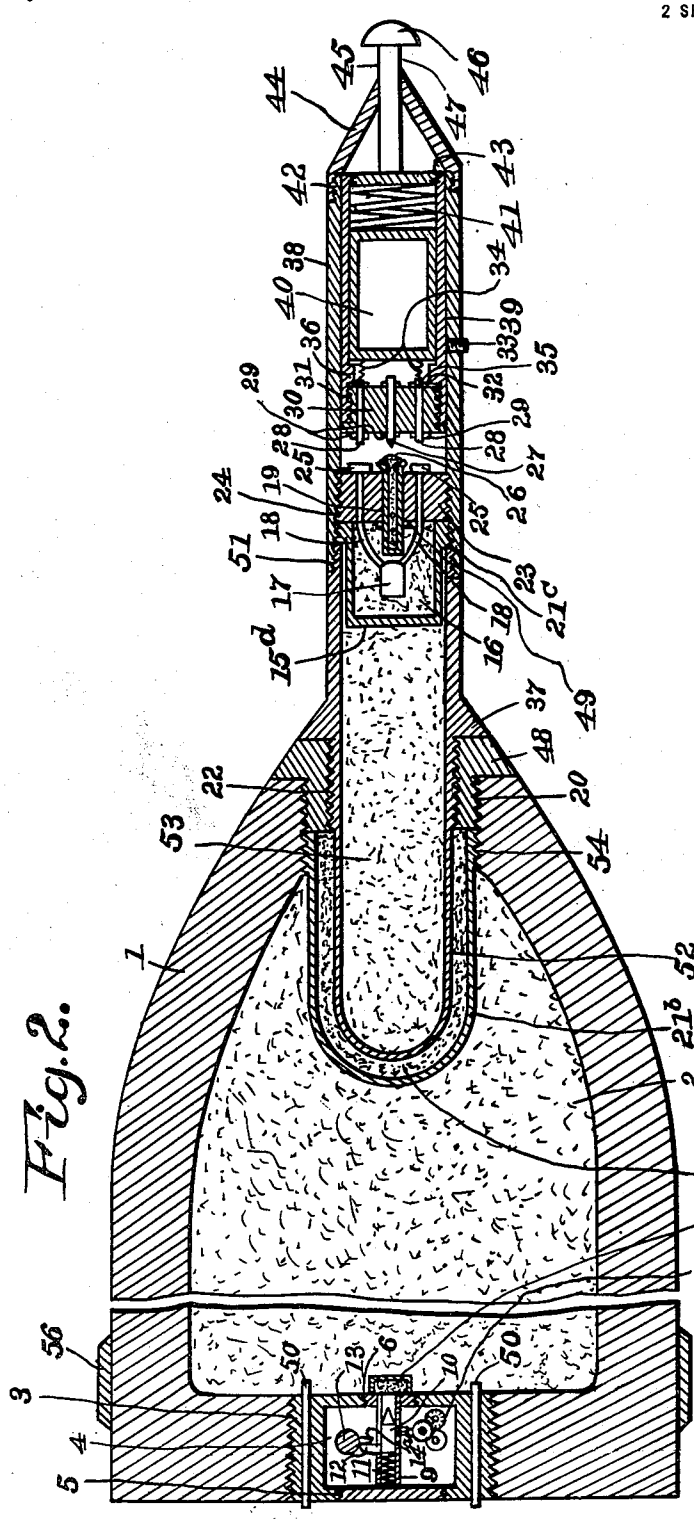


Fig. 2.

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UNITED STATES PATENT OFFICE

ROBERT LEE WRIGHT, OF LOS ANGELES, CALIFORNIA.

PROJECTILE.

1,374,705. Specification of Letters Patent. Patented Apr. 12, 1921

Application filed April 17, 1920. Serial No. 374,612.

To all whom it may concern:

Be it known that I, ROBERT LEE WRIGHT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Projectiles, of which the following is a specification.

This invention relates to projectiles, and is a modified form of the projectiles shown in my copending applications, Serial Numbers 218,797; 235,482; and 314,165; being a continuation in part of my application for patent filed July 29, 1919, Serial No. 314,165.

One of the particular objects of this invention is to provide a shell-pointer with a plurality of separate means therein to explode projectiles upon contact with the ground, object or target, and a plurality of separate means to explode projectiles at a predetermined time after having been discharged from any gun or firearm.

Another object of my invention is to provide a projectile with a shell-pointer with a channel therein and explosives within said channel leading to the explosive charge in the projectile in a way that the shell-pointer and projectile will be simultaneously exploded when the combined firing pin and electric switch mounted in the forward end of the shell-pointer comes in contact with the ground, object or target.

The value and objects of my invention will be fully understood from the following description taken in connection with the drawings, which show a longitudinal sectional view of my invention.

Figure 1 shows an explosive projectile 1 with explosive charge therein and shell-pointer extending out from the forward end of the projectile.

Fig. 2 is a modified form of Fig. 1.

1 shows an explosive projectile with a cavity and a charge 2 therein, a slim shell-pointer 38 extending out of the point of the projectile. 3 indicates a removable plug and screw-threads where the plug may be removed to place explosives within the projectile; 4 is a cavity in the removable plug suitable to hold a timing device; 5 is the removable plug and screwthreads on same, which may be removed to place a timing device within the cavity 4. 6 shows the removable plug and screwthreads on same, in which a part of the timer and cap is secured and may be removed by unscrewing said plug. 7 is a cap secured to the plug, and 8 indicates a timing device composed of clockwork casing and firing pin with lug therein, a driving spring and a rotatable shaft with a notch in same connected to the clockwork in a way to rotate said shaft. 9 shows the casing in which the firing pin moves. 10 indicates the firing pin; 11 is the driving spring in the casing around the rear end of the firing pin; 12 is the lug on the firing pin; 13 shows the rotatable shaft connected to the clock work, and 14 indicates the notch in said shaft through which the lug 12 on the firing pin escapes. The operation of this timing device is explained as follows: When the clockwork 8 is wound, it rotates the shaft 13 and presses the firing pin 10 back against the driving spring 11, and as the shaft continues to rotate the lug 12 on the firing pin 10 escapes through the notch 14 in the shaft 13, at which time the driving spring 11 drives the firing pin 10 forward and explodes the cap 7 by percussion.

48 indicates a bushing in the point of the projectile in which one end of the shell-pointer 38 is screwed, as shown, by screwthreads 22. 20 indicates the screwthreads where the bushing is screwed into the point of the projectile and 21 shows the screwthreads where the light tube 15 is screwed into the inner part of the bushing abut the inner end of the shell-pointer, 16 is the explosive charge within the light tube 15. 23 indicates an electric socket containing a removable tube with explosives therein as shown at 19 and electric wires 18 leading from the socket to a cap or detonator 17. 25 is copper contact plates on the electric socket. 24 shows screwthreads where the electric socket 23 is screwed into the rear end of the shell-pointer. 26 is the removable cap secured in the forward end of the perforated tube 19, as shown, with explosives therein.

27 indicates the firing pin in the electric plug 30 that explodes the cap 26 by percussion, and 28 shows pins that form an electric switch which closes the electric circuit when the ends of the pins come in contact with the copper plates 25. 37 indicates a shoulder on the shell-pointer that abuts the bushing 48. 29 shows the shoulder on the electric pins and percussion pin forming the electric switch which shoulders abut the electric plug 30, as shown. 31 is the screwthreads where the electric plug 30 is screwed into the rear end of the combined firing pin and elec-

tric switch. 32 shows nuts or taps screwed on to ends of the pins to hold same in position in the electric plug 30. 36 shows shoulders in the combined firing pin and electric switch to hold the electric plug 30 and the electric battery 40 in position.

34 shows electric wires leading from the electric battery 40 to the pins 28 and 35 shows where said wires are secured to said pins. 33 indicates a set screw or any suitable means for holding the combined firing pin and electric switch in position.

41 shows a spring to hold the electric batter 40 in position. 42 indicates screw-threads where the forward end of the shell-pointer 44 is screwed onto the shell-pointer as shown. 43 indicates a removable end and screw-threads on same in the forward part of the combined firing pin and electric switch for the purpose of removing the electric battery 40. 45 indicates the forward end of the combined firing pin and electric switch; the same can be made any length desired to best pierce the water and explode the projectile above the surface of the ground when the forward end of same comes in contact with the ground, object or target. 46 shows an enlarged head on the forward end of the combined firing pin and electric switch, but the same may be used as well or better in some cases if desired without the enlarged head as shown. The forward point of the shell-pointer 44 may be made thicker or stronger if desired instead of the inside part being made hollow as shown. 47 is a raised place on 45 that moves in a groove within the point 44 in order to cause the combined firing pin and electric switch to move directly inward when the forward end of same comes in contact with the ground, object or target. 49 indicates a nut or cap screwed on the perforated tube 19, to hold same in position, in the electric socket. The shoulders on the three pins that form the combined firing pin and electric switch are indicated at 29 and the nuts or taps on same are indicated at 32. The cap 26 may be placed in a cap holder and screwed into the forward end of the perforated tube 19 or the cap may be secured in the end of the perforated tube. A removable plug may be screwed into the end of the perforated tube.

56 shows the driving band. The special shape of the forward part of the shell pointer as shown by 44 is important as it allows the forward end of the combined firing pin and electric switch to come in contact with the ground, object or target more quickly when fired at an angle, and also pierces the water and air with less resistance.

The operation of Fig. 1 may be understood as follows: When the forward end of the combined firing pin and electric switch comes in contact with the ground, object or target the same is pressed inward by percussion, thereby causing the pins 27 and 28 to explode the percussion cap 26 and close the electric circuit at 25, thus igniting the explosive charge within the perforated tube 19 and cap or detonator 17, and ignite the explosive charge 16 and ignite the explosives in tube 15, and thus igniting the explosive charge 2 in the cavity of the projectile by a plurality of separate means, and also ignite the explosive 2 by a plurality of separate means at a predetermined time with timing devices as shown and explained.

Fig. 2 is the same as Fig. 1 as shown by the numerals being the same and meaning the same in every way as explained in Fig. 1, excepting the numerals hereinafter explained and for this reason the same numerals shown in Fig. 2 that are shown in Fig. 1 will not be explained again in Fig. 2. The differences are explained as follows: 14^a shows a lug on the shaft 13 and as the clock work 8, when wound, rotates the shaft 13, the lug 14^a presses against the lug 12 on the firing pin 10; by continuous rotating it releases the lug 12 and the driving spring 11 drives the firing pin forward and explodes the cap 7. 50 indicates the old time well known cord fuse that ignites the explosive charge 2 when the cord burns up to the end of the fuse adjacent to explosive charge within the cavity of the projectile. The end of the cords are ignited when the projectile is fired from a gun. These cord fuses may be made removable by placing same in a plug for each of same and screwed into the projectile or removable plug in a way to reach the charge in the projectile as shown. It is well known that any one of the ways shown will explode if it operates and the plurality of separate means shown and explained are for the purpose of making it positive that the projectile will be exploded and will not be wasted. Should one means fail to explode same which very often happens, it is plainly to be seen that this invention of a plurality of separate means for exploding projections is a great saving on account of preventing many projectiles being wasted by one means failing to explode same. 51 shows the screwthreads where the shell-pointer 38 is taken apart in order to screw the electric socket 23 and casing 15^d into that part of the shell-pointer about the rear end of the electric socket 23. 52 is the rear part of the shell-pointer as shown with a tube 21^b formed around the rear end of the shell-pointer and screwed into the projectile as shown at 54. 55 indicates the explosive charge in the tube 21^b surrounding the rear end of the shell-pointer, as shown, and 53 is the explosive charge in the shell pointer. This charge may be made any size, by increasing the

length and width of the shell-pointer and the cavity for holding explosives therein. Driving bands are shown at 56. The operation of Fig. 2 may be understood as follows:—

When the forward end of the combined firing pin and electric switch comes in contact with the ground, object or target the same is pressed inward by percussion, thus causing the pins 27 and 28 to explode the percussion cap 26 and close the electric circuit at 25, thus exploding the perforated tube 19 and cap or detonator 17, and ignite the explosive charge 16 and explode the tube 15^a, thus igniting the explosives 53 and exploding the shell-pointer and igniting the explosive charge 55 within the tube 21^b and igniting the explosive charge 2 within the projectile by a plurality of separate means and also ignite the explosive charge 2 by a plurality of separate means at a predetermined time with timing devices as shown and explained.

It is obvious that those skilled in the art may vary the details of construction as well as arrangements of parts without departing from the spirit of the invention, and therefore, I do not wish to be limited to the above disclosure except as may be required by the claims.

What I claim as new and desire to secure by Letters Patent is:

1. An ordnance projectile having an explosive charge and means for detonating same, said means including an axially arranged projection at the forward end of the projectile, a longitudinal bore within said projection, a detonating charge in alinement with the rear of said bore through said projection and in operative relation to the explosive charge in the projectile, another detonating charge and means for detonating the latter including a combined contact electric switch and firing pin engageable by contact electric switch means and contact percussion cap and fuse.

2. An ordnance projectile having an explosive charge within and having a projection secured to the forward end thereof extending axially, a plurality of cavities formed within said projection, an explosive charge within each of said cavities, means to ignite and explode the most forward explosive charge within said projection with a plurality of separate means and means to ignite and explode a plurality of explosive charges within the projection and projectile with the effects and force of the explosion of each explosive charge exploded in advance of each other.

3. An ordnance shell having an explosive charge within and having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projection, an explosive charge within each of said cavities, a contact combined electric switch and firing pin and fuse secured in said projection in a way to ignite and explode the most forward explosive charge within said projection and means to ignite and explode a plurality of explosive charges within the projection and shell with the effects and force of explosion of each explosive charge exploded in advance of each other.

4. An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projection, an explosive charge within each of said cavities, a combined contact electric switch and firing pin and fuse secured within said projection in a way to ignite and explode the most forward explosive charge within said projection when said contact electric switch and firing pin comes in contact with the ground, object or target, and means to ignite and explode a plurality of explosive charges within said projection with the effects and force of the explosion of each explosive charge exploded in advance of each other.

5. An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities formed within said projection, an explosive charge within each of said cavities, a combined contact electric switch, detonator, firing pin and fuse secured in said projection in a way to ignite and explode the most forward explosive charge within said projection when the said combined contact firing pin and electric switch comes in contact with the ground, object or target, and means to ignite and explode the second explosive charge within said projection with the effects and force of the explosion of the said first explosive charge.

6. An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projection, an explosive charge within each of said cavities, a combined contact firing pin and electric switch, and tube having an explosive charge within a cap secured in said tube engageable by said firing pin in a way to explode said cap and ignite said explosive charge within said tube when the combined contact firing pin and electric switch comes in contact with the ground, object or target, and means to ignite and explode the most forward explosive charge within said projection and means to ignite and explode a plurality of said explosive charges with the effects and force of the explosion of each explosive charge exploded in advance of each other.

7. An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projection, an explosive charge

within each of said cavities, means to ignite and explode the most forward explosive charge within said projection with a plurality of separate means simultaneously and with one means if the other fails, means to ignite and explode a second explosive charge with the effects and force of the explosion of the said first explosive charge.

8. A projectile having a suitable cavity within to hold an explosive charge and a point formed thereon, an explosive charge within said cavity, a removable breech plug with a cavity therein, a timing device positioned in said cavity, means to remove said timing device, said timing device comprising a spring-pressed firing pin, a lug on said firing pin, a rotatable shaft, a lug on said shaft to engage and disengage the lug on the firing pin and clockwork to rotate said shaft when wound, and means to ignite the explosive charge within the cavity of the projectile by a plurality of separate timing means at a predetermined time after said projectile has been discharged from any gun, firearm or device capable of firing same.

9. An ordnance projectile having a shell-pointer comprising a projection secured to the forward end thereof extending axially and formed with a longitudinal bore in combination with a pair of electric contact plates and a contact fuse having a plurality of detonating charges in alinement with the bore of said shell-pointer and at the rear end a detonating charge in operation to the booster charge of the shell and communicating with and in alinement with the said passage.

10. An ordnance projectile having a shell-pointer comprising a projection secured to the forward end thereof extending axially and formed with a longitudinal passage in combination with a pair of electric contact plates and a contact fuse having a plurality of detonating charges in operative relation to the forward end of said passage and a second detonating charge at the rear end of said passage in operative relation to the explosive charge of the projectile.

11. An ordnance projectile having a shell-pointer at the forward end thereof formed with a longitudinal passage therethrough in combination with a pair of electric contact plates and a contact fuse secured in the forward part of said shell-pointer and having a plurality of detonating charges in operative relation to the forward end of said passage and a second detonating charge in operative relation to the rear end of said passage in operative relation to the explosive charge of the projectile.

12. An ordnance projectile having a shell-pointer comprising a projection at the forward end thereof formed with a longitudinal passage therethrough in combination with a pair of electric contact plates and a contact fuse secured in the forward part of said shell-pointer on, and having a plurality of detonating charges in operative relation to the forward end of said passage, and a second detonating charge in operative relation to the rear end of said passage and to the explosive charge of the shell, the walls of said projection, the passage therethrough, the contact fuse and the detonating charges being substantially symmetrical with respect to the axis of the shell and having their axes in alinement with each other and with said axis of the shell so that the centrifugal forces due to axial rotation of the shell when it is fired will be balanced in each cross section of the device.

13. An ordnance projectile having a shell-pointer comprising a projection at the forward end thereof formed with a longitudinal passage therethrough in combination with a pair of electric contact plates and a contact fuse secured in the forward part of said shell-pointer and having a plurality of detonating charges in operative relation to the forward end of said passage and a second detonating charge in operative relation to the rear end of said passage and to the explosive charge of the projectile, said shell-pointer having its walls of material and thickness sufficient to confine the pair of electric contact plates and a contact fuse and a plurality of detonator explosions against material lateral expansion.

14. An ordnance projectile having an explosive charge and means for detonating same, said means including an axially arranged tubular projection at the forward end of the projectile, a detonating charge in alinement with the rear of the passage through said projection and in operative relation to the explosive charge in the projectile and in alinement with the forward end of said passage another detonating charge and means for detonating the latter including a combined contact electric switch and firing pin engageable by the electric contact plates and contact fuse.

15. An ordnance projectile having an explosive charge, a detonating charge in operative relation thereto and a pair of electric contact plates and a contact fuse having a plurality of detonating charges and means including a combined contact electric switch and firing pin for detonating the latter, in combination with a tubular forward extension for the shell of small diameter, light weight and considerable length as compared with the projectile, said extension having said pair of electric contact plates and contact fuse secured in the forward part thereof and having a tubular cavity extending in a straight line from the projectile detonator to the plurality of detonators connecting with the electric contact plates and contact

fuse with the result of exploding the shell substantially in advance of the object which operates the combined contact electric switch and firing pin.

16 An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projection, an explosive charge within each of said cavities, a combined contact firing pin and electric switch and perforated tube with an explosive charge within and a cap secured within said tube in a way to ignite the explosive charge when the cap is exploded secured in said projection, means to ignite and explode the most forward explosive charge within said projection and means to ignite and explode a plurality of said explosive charges with the effects and force of the explosion of each explosive charge exploded in advance of each other.

17. An ordnance shell having a projection secured to the forward end thereof extending axially, a plurality of cavities secured within said projections, an explosive charge within each of said cavities, in combination with a combined contact firing pin, and electric switch, a tube for explosives and cap and fuse and electric battery secured in said projection, means to ignite and explode the most forward explosive charge within said projection and means to ignite and explode a second explosive charge with the effects and force of the explosion of the said first explosive charge.

18. An ordnance shell or projectile having a projection secured to the forward end thereof extending axially, an electric battery and electrical means secured within said projection to ignite a plurality of explosive charges within said shell or projectile.

19. A breech block for an ordnance shell having a cavity within provided with a time fuse extending therethrough, to an explosive within the shell, front and rear apertures in said breech block, a closure threaded in each aperture, one of said closures carrying a firing mechanism operative after a predetermined time to fire a denonator associated therewith.

20. A breech block for an ordnance shell having a cavity within provided with a time fuse extending therethrough to an explosive within the shell, front and rear apertures in said breech block, a closure threaded in each aperture, and a firing device secured within said cavity within said breech block operative after a predetermined time to fire a detonator charge associated therewith.

21. A breech block for an ordnance shell having a cavity within provided with a time fuse extending therethrough to an explosive within the shell, front and rear apertures in said breach block, a closure threaded in each aperture, and a firing device comprising a spring pressed firing pin with a lug on the firing pin, a rotating shaft carrying means to engage and disengage the lug on the firing pin when the said shaft is rotated and clock work to rotate said rotating shaft when the spring of the clock work is wound, operative after a predetermined time to explode a percussion cap by percussion and ignite the explosive within the shell.

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