C. A. MEILICKE.

PROJECTILE.

APPLICATION FILED APR. 22, 1918.

1,290,275. Patented Jan. 7, 1919.

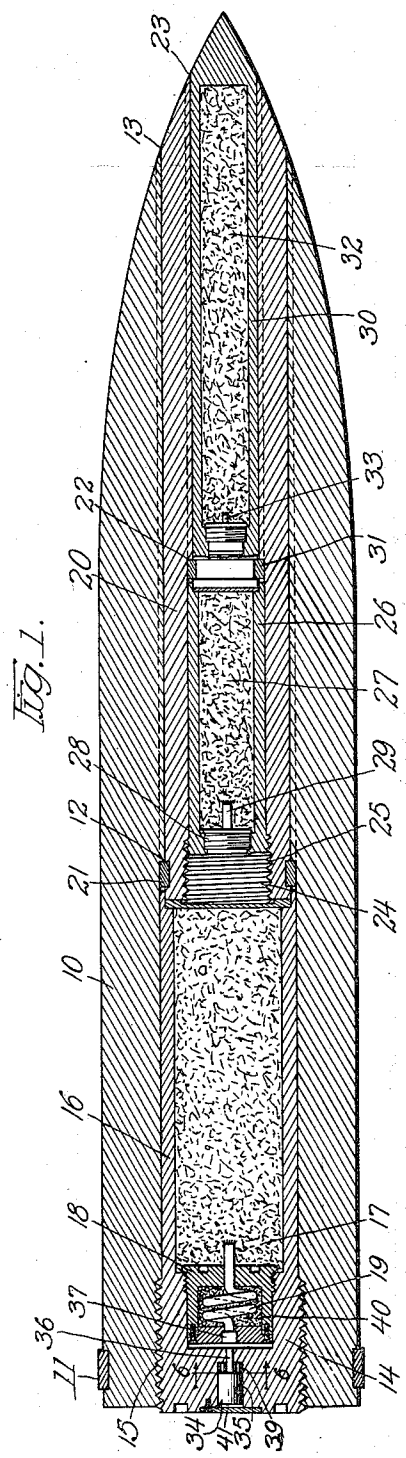

Fig. 1.

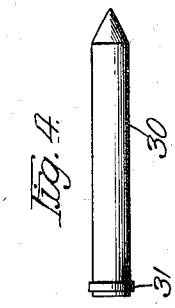

Fig. 4.

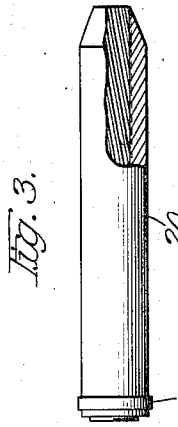

Fig. 3.

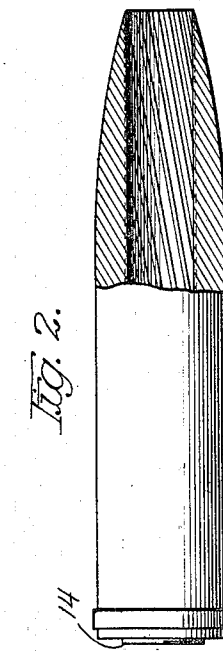

Fig. 2.

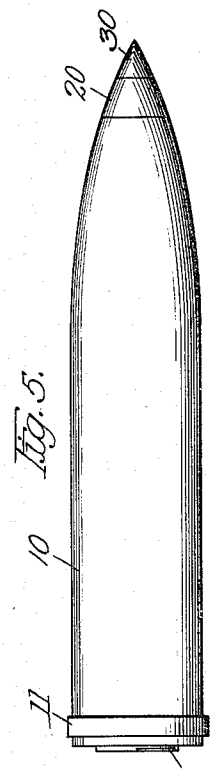

Fig. 5.

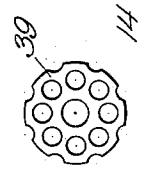

Fig. 6.

Inventor.
Carl A. Meilicke.
Fowle Bain & Cook
Attys.

UNITED STATES PATENT OFFICE.

CARL A. MEILICKE, OF CHICAGO, ILLINOIS.

PROJECTILE.

1,290,275. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed April 22, 1918. Serial No. 229,921.

To all whom it may concern:

Be it known that I, CARL A. MEILICKE, a citizen of the Dominion of Canada, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Projectiles, of which the following is a specification.

My invention relates to projectiles for large guns.

One of the objects of my invention is to provide a new and improved projectile whereby to increase the effective range, accuracy and destructive execution of large guns, without changing or modifying the gun.

The range of large guns discharging a single projectile has about reached the extent of their possible capability. The steel of which said guns is made is now taxed to a dangerous limit, so that a larger quantity of explosive, or more powerful explosive to attain a greater muzzle-velocity is not available.

Increase in the bore of the gun to contain a larger quantity of the explosive, and the diametric area of the missile to increase the effective pressure is practically counterbalanced by the increase of skin friction of the large missile in its passage through the air, due to its accommodation enlargement for the increased diameter of the bore.

In carrying my invention into effect I provide a projectile comprising a series of self propelling, inclosed missiles, each inclosed missile having its own charge to be exploded at a predetermined time after the major missile leaves the muzzle of the gun and at intervals thereafter.

The outside shell, of the major missile, fits the bore of the gun and it, with its contained minor missiles, is projected from the gun by the initial explosion of a charge within the gun. Within the major missile the smaller missiles are telescopically arranged. The concussion produced by the primary explosion ignites a time fuse for the charge of the missile next in size. At a predetermined distance from the gun, this secondary charge will eject the smaller missiles from the outer shell of the projectile and thus accelerate the velocity of the smaller missiles. The concussive effect of the secondary charge will light the time fuse for exploding the tertiary charge at a given time, thus further accelerating the speed of the discharged missiles following each explosion and greatly increasing the distance range of the projectile.

In the accompanying drawings I have shown a single embodiment of my invention for the purpose of clear disclosure, wherein—

Figure 1 is a central longitudinal section of the projectile showing two minor missiles contained in the outer shell.

Figs. 2, 3 and 4 show the missiles separated.

Fig. 5 shows a side elevation of the projectile with the missiles assembled, as they would appear when leaving the gun.

Fig. 6 is an elevation of a crushable washer looking with the arrows on line 6—6 of Fig. 1.

In all the views the same reference characters are employed to indicate similar parts.

The outer shell 10 of the projectile or larger missile is supposed to fit the bore of the gun. Surrounding the breech it is provided with a soft ring 11, of copper or the like, to engage the rifles to the gun. The shell is itself internally rifled from the point 12 to the front open end of the shell, as at 13.

The breech block 14 is insertible in the breech end of the shell, by screw threads 15. An integral cylindrical part 16 of the breech block, contains an explosive charge 17, and serves as an abutment to prevent the subsidiary missiles from crushing the contained charge.

In the breech block 14, a hollow plug 18 is screwed. This chamber contains a coiled time-fuse 19. It is coiled so as to accommodate a greater or less quantity of fuse, in accordance with the time interval between which the charges are to be fired.

The secondary missile 20, or the next in size, has a rifle ring 21, and it is internally rifled from the point 22 to its open end 23. It also has a breech block 24, threaded, as at 25, and an integral cylindrical part 26 extending forwardly and affording an abutment for the next smaller missile. The charge 27 is exploded by the time fuse 29 within the chamber of the plug 28.

The smallest missile 30 is provided with a rifle ring 31 to engage the rifle of the missile 20. It is filled with a charge 32, of high explosive, which may be ignited by the time fuse 33 at a predetermined time after it leaves the muzzle of the missile 20. This missile, however, may be provided with any

other approved means for exploding a charge, such for example, as a detonating cap adapted to be fired by concussion or impact, as when the missile strikes a relatively stationary object, or by a means responsive to arrest the motion of the final missile, or, if desired, it may be a solid shot for penetrating armor, or the like.

Each of the missiles in the embodiment illustrated is provided with a time fuse, such as shown more clearly at the left of Fig. 1 and which operates in a similar manner. The chamber, within the plug 18, is to be filled with soap 40, or like material, which will prevent any possibility of electrostatic sparks passing from one part of the fuse to the other or passing from the walls of the missile to the fuse and igniting it, causing premature or short time explosion.

A plunger or piston 34 is contained within a cylinder 35 of the breech block. The plunger carries a firing pin 36 which is adapted to detonate the fuse-firing fulminate cap 37, in the end of which the fuse is contained, or in the near proximity of which it may terminate.

The pin is maintained out of contact with the cap by a perforate crushable washer 39. The pin passes through the central perforation of the washer and is adapted to engage the cap. A plate 41 of fragile material is secured to the plug 14 over the end of the cylinder 39.

The impact of the charge crushes the plate 41 and the washer 38, and drives the plunger 34 forward so that the pin 36 will cause detonation of the cap 37, which in turn ignites the time fuse 19. The time fuse is of such length as to ignite a charge 17, in which it is embedded, after a predetermined period following the explosion. The charge 17 should be ignited when long distance shots are being fired, just about the time when the projectile has turned, or is about to turn, the knee of the curve in the trajectory of its flight. This will eject the missile 20 and the contained missile 30, and accelerate their rotative and projective velocity. The firing of the charge 17 will ignite the time fuse 29 in the same manner and, at a selected time, the charge 27 will be ignited, thereby ejecting the missile 30 from the missile 20 and increasing its rotative and projective velocity.

When the missiles 20 and 30 leave their respective associated positions, they are given greater rotative effect by the rifles of the shell within which they were contained and from which they are projected, or in other words, the succeeding explosions augment the energetic activity contributed to them by the effect of the explosion of the initial charge within the gun from which they were projected. Thus a relay effect is produced by firing successive charges at proper time intervals thereby urging a smaller projectile, or unit, of the projectile, to its final mark.

While I have herein shown a series of three relay projectiles in the present illustration, a greater or smaller number may be used. From a 16 inch gun as many as six separate relay projectiles may be fired; one sixteen inch, one ten inch, one seven inch, one four and half inch, one three inch, and one two inches in diameter, with corresponding advantages.

Guns of the present type could be fired, with my relay projectile at much lower angles with comparatively straight trajectories, which would greatly increase their accuracy and destructive efficiency.

Assuming, for example, that one of my sixteen inch projectiles were fired from a gun. A ten inch relay projectile fired from this sixteen inch shell shortly afterward would attain 1200 f. s. velocity to be added to the initial velocity of the composite projectiles and the outer shell will be dropped or shed from those that are progressing forwardly, and if the third, say a seven inch projectile were fired from the first relay projectile an additional velocity of 800 to 1200 f. s. could be added so that if we started with a velocity of 2500 f. s. and added to this 2000 f. s., the seven inch projectile would attain the enormous velocity of 4500 f. s. which is almost double the velocity possible from firing a single projectile from modern guns. This enormous velocity if fired from the ground level, would land the final or ultimate projectile, which is the smallest of the series, 75 miles distance from the gun. A seven inch projectile with a 4500 f. s. velocity would have a terrible destructive effect and would, if fired at a low angle, for example, from 5 to 15 degrees, have a very straight trajectory and reach its objective mark at approximately 30 miles distant. Compared with modern guns and the ordinary well known projectiles which hardly reach 25 miles even though the projectile is fired at an angle of 45 degrees, this is a remarkable accomplishment.

While I have herein shown a single embodiment of my invention, for the purpose of clear disclosure, it is manifest that many changes in the general arrangement and configuration of the parts may be made, within the scope of the appended claims, and that the invention is susceptible of modifications with respect to the number of projectiles or sub-projectiles that may be contained in the major shell forming a part thereof.

Having described my invention, what I claim is:—

1. A projectile including an outer shell having a bore and internally rifled for a por-

tion of the length thereof, a breech block removably inserted in the breech end of the shell, said breech block having an elongated cylindrical part containing an explosive charge, a time fuse construction removably mounted in said breech block and a firing pin in said breech block to ignite said fuse when the initial charge in the gun is exploded, a second shell fitting within the rifle part of said first shell with its breech end engaging the end of the cylindrical part of the breech block.

2. A projectile including an outer shell having a bore and internally rifled for a portion of the length thereof, a breech block removably inserted in the breech end of the shell, said breech block having an elongated cylindrical part containing an explosive charge, a time fuse construction removably mounted in said breech block and a firing pin in said breech block to ignite said fuse when the initial charge in the gun is exploded, a second shell fitting within the rifle part of said first shell with its breech end engaging the end of the cylindrical part of the breech block, said second shell having a bore and internally rifled, a breech block removably inserted in the breech end of said second shell, said breech block having an elongated cylindrical part containing an explosive charge, a time fuse construction removably mounted in said breech block and a firing pin in said breech block to ignite said fuse when the charge in the first mentioned shell is exploded, and another shell fitting within the rifle part of the bore of said second shell with its breech end engaging the end of the cylindrical part of the breech block of the second shell.

3. A projectile including an outer shell, having a bore and internally rifled for part of the length of said bore, a breech block construction screwed into the breech end of said shell and having an elongated cylindrical part adapted to contain an explosive charge, a time fuse construction mounted in the breech block and adapted to be ignited by the explosion of the charge of the gun, and a second shell mounted in the bore of said first shell and having its breech end engaging the end of the cylindrical part of the breech block.

4. A projectile including an outer shell, having a bore and internally rifled for part of the length of said bore, a breech block construction screwed into the breech end of said shell and having an elongated cylindrical part adapted to contain an explosive charge, a time fuse construction mounted in the breech block and adapted to be ignited by the explosion of the charge of the gun, and a second shell mounted in the bore of said first shell and having its breech end engaging the end of the cylindrical part of the breech block, said second shell also having a charge and a time fuse construction adapted to ignite the charge from the explosion of the charge in said first mentioned shell.

In testimony whereof I hereunto set my hand.

CARL A. MEILICKE.