K. VÖLLER.

ARTILLERY PROJECTILE.

APPLICATION FILED MAR. 19, 1909.

1,039,850. Patented Oct. 1, 1912.

Fig. 1.

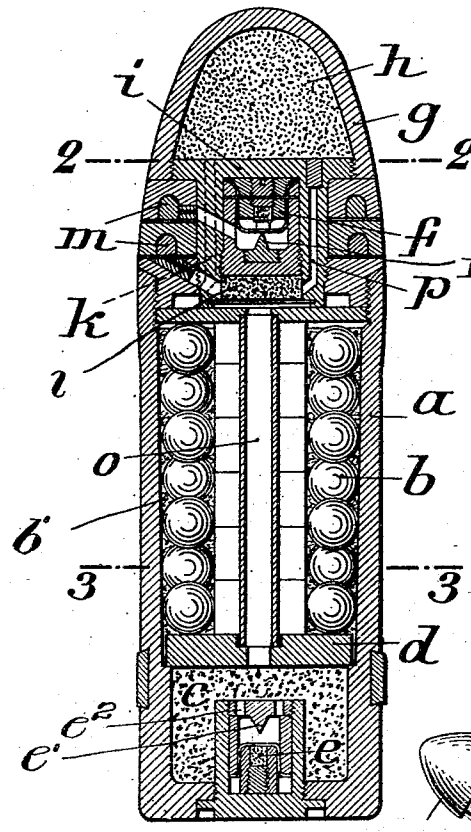


Fig. 2.

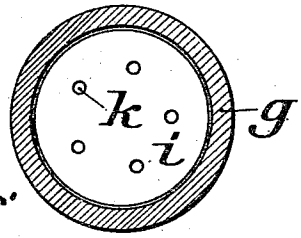


Fig. 3.

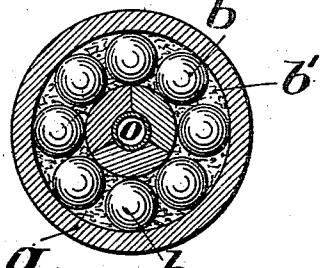
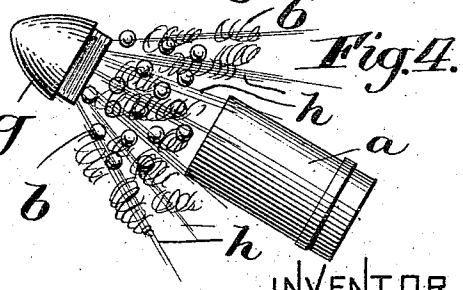


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

KARL VÖLLER, OF DUSSELDORF, GERMANY, ASSIGNOR TO RHEINISCHE METALLWAAREN- UND MASCHINENFABRIK, OF DUSSELDORF-DERENDORF, GERMANY.

ARTILLERY-PROJECTILE.

1,039,850. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed March 19, 1909. Serial No. 484,518.

To all whom it may concern:

Be it known that I, KARL VÖLLER, engineer, a subject of the German Emperor, residing at 17 Fulicherstrasse, Dusseldorf, Germany, have invented certain new and useful Improvements in Artillery-Projectiles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an artillery projectile and particularly to that kind intended for use in firing against balloons, air ships and the like, where it is desired to set the target on fire as well as to do damage by impact.

According to the present invention the shell comprises a combination of shrapnel charge and rocket charge so arranged that during flight the two charges separate and each performs its own function, the flame issuing from the rocket charge serving to ignite the balloon or other target and the shot of the shrapnel charge piercing the gas envelop or body of the target and striking the crew, while the slow-burning matrix of the shrapnel charge, set on fire by the rocket flame adds to the destructiveness of the shell.

The invention, as particularly set out in the accompanying claims, will now be described with reference to a preferred embodiment of the same as illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through the shell; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is a similar section on the line 3—3 of Fig. 1; and Fig. 4 is a diagrammatic view representing the projectile in flight at about the time of striking the target.

In these drawings, *a* represents the shell casing, which contains in its medial portion the shrapnel shot *b* embedded in a matrix *b'* of slow-burning, combustible material. In the rear portion of the casing the expelling charge *c* is separated from the shrapnel charge *b b'* by the disk *d*, and surrounds the primer *e*. In the fore part of the shell is the primer *f* of the time fuse, and yet in front of the timing device is mounted the rocket comprising the cap *g* containing the charge *h* retained therein by the plate *i*, this plate being provided with perforations *k*, rearwardly extending on diverging lines, for the emission of flame from the charge *h* in flight after the manner of the usual rocket.

When the shell is fired from a gun, the set back causes the primer *f* to strike against the anvil *f'* and the flame travels by way of the time ring *m m* to the flash charge *n* and thence by the channel *o* to ignite the expelling charge *c* and simultaneously through the channel *p* to ignite the rocket charge *h*. The effect of the ignition of the expelling charge *c* is to force the shrapnel charge *b b'* out of the casing, carrying before it the timing device and the rocket, which are without disruption blown out of the front end of the casing by stripping the threaded engagement therewith. The shrapnel charge issuing in the flame area to the rear of the rocket, the combustible matrix *b'* is thereby set on fire and scattered doing much fire damage in addition to that done by the flame issuing on diverging lines from the rocket which pursues its course through the gas envelop of the balloon or other target, if well aimed. The shrapnel shot scattering in the known way add to the destructive effect of the shell. If for any reason the time fuse should prove defective or be too slow in action, the charge *c* will be set off when the shell strikes the target by the concussion, the sudden stoppage causing the primer *e* to strike the anvil *e'* and setting off the charge *c* through the opening e^2. In this case the flame travels in the reverse direction through the channel *o* to the charge *n*, and thence through the channel *p* to the rocket charge *h*. If the course of the shell is stopped by such striking of the target before being set off, the flames from the rocket, the scattering burning matrix and the shot, together with the explosive force of the charge *c* all contribute to the destructive localized effect of the shell.

What I claim is:

1. In a projectile, a shrapnel charge and a rocket charge, and means to simultaneously expel the charges and to ignite the rocket charge.

2. In a projectile, a shrapnel charge, comprising shot embedded in a combustible matrix, and a rocket charge in advance of the shrapnel charge and arranged to emit flames

to the rear, and means to simultaneously expel the two charges and ignite the rocket charge.

3. In a projectile, a shrapnel charge comprising shot embedded in a slow-burning matrix, and a rocket charge in advance of the shrapnel charge and arranged to emit flame to the rear on diverging lines, an expelling charge to expel the two charges, and a time fuse to simultaneously ignite the expelling charge and the rocket charge.

4. In a projectile, a casing, an expelling charge in the rear thereof, a shrapnel charge in the casing in front of the expelling charge, a rocket removably seated in the casing in advance of the shrapnel charge, said rocket containing a chamber filled with a flame-producing charge and open to the rear through channels, and means to simultaneously ignite the expelling charge and the rocket charge.

5. In a projectile, a casing, an expelling charge in the rear thereof, a shrapnel charge in the casing in front of the expelling charge and comprising shot embedded in a combustible matrix, a rocket removably seated in the casing in advance of the shrapnel charge and comprising a body containing a confined charge with outlet to the rear, and a time fuse arranged to simultaneously ignite the expelling charge and the rocket charge.

6. In a projectile, a casing, an expelling charge in the rear thereof, a shrapnel charge in the casing in front of the expelling charge and comprising shot embedded in a combustible matrix, a rocket removably seated in the casing in advance of the shrapnel charge and comprising a body containing a confined charge with outlet to the rear, a time fuse arranged to simultaneously ignite the expelling charge and the rocket charge, a concussion primer communicating with the expelling charge and an igniting communication between the expelling and rocket charges.

7. In a projectile, a casing, an expelling charge in the rear thereof, a shrapnel charge in the casing in front of the expelling charge and comprising shot embedded in a combustible matrix, a rocket removably seated in the casing in advance of the shrapnel charge and comprising a body containing a confined charge with outlet to the rear, the two charges in communication by way of a passage, a flash charge in communication with said passage, and a time fuse comprising a firing primer and time train leading to the flash charge.

8. In a projectile, a casing, an expelling charge in the rear thereof, a shrapnel charge in the casing in front of the expelling charge and comprising shot embedded in a combustible matrix, a rocket removably seated in the casing in advance of the shrapnel charge and comprising a body containing a confined charge with outlet to the rear, the two charges in communication by way of a passage, a flash charge in communication with said passage, and a time fuse comprising a firing primer and time train leading to the flash charge and a concussion primer communicating directly with the expelling charge.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

KARL VÖLLER.

Witnesses:
OTTO KÖNIG,
B. MEYER.