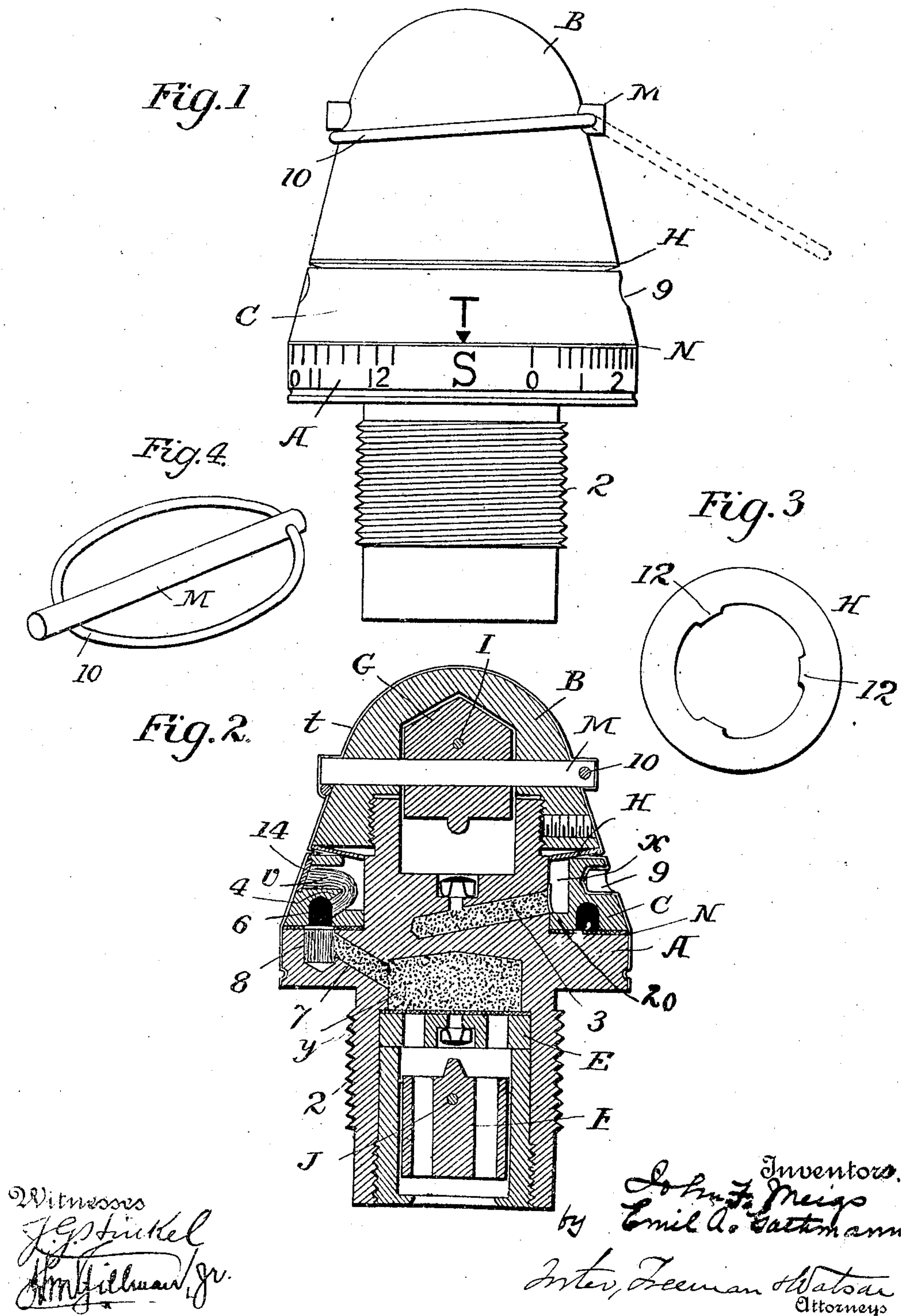


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J. F. MEIGS & E. A. GATHMANN.
COMBINATION TIME AND PERCUSSION FUSE.

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Witnesses
J. G. Strickel
H. M. Gillman, Jr.

Inventors,
J. F. Meigs
E. A. Gathmann
by
J. F. Meigs
E. A. Gathmann
Inter, Zeeman & Watson
Attorneys

UNITED STATES PATENT OFFICE.

JOHN F. MEIGS AND EMIL A. GATHMANN, OF SOUTH BETHLEHEM, PENNSYLVANIA, ASSIGNORS TO BETHLEHEM STEEL COMPANY, OF SOUTH BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

COMBINATION TIME AND PERCUSSION FUSE.

No. 814,860.

Specification of Letters Patent.

Patented March 13, 1906.

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To all whom it may concern:

Be it known that we, JOHN F. MEIGS and EMIL A. GATHMANN, citizens of the United States, residing at South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in a Combination Time and Percussion Fuse, of which the following is a specification.

Our invention relates to time-fuses; and it consists of a casing provided with suitable exploders with means for retaining the time-hammer in position, which also may be employed for turning the setting-ring, and in certain arrangements of the chambers and conduits for the firing-powder, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is an external view of a fuse embodying our improvements. Fig. 2 is a longitudinal sectional view. Fig. 3 is a plan view of the spring-washer. Fig. 4 is a perspective view of the retaining-bar and bale.

The casing of the fuse consists of the body A, having a threaded boss 2 for attachment to the projectile, a cap B, and intermediate the parallel faces of the body and cap turns the setting-ring C, having a mark which may be brought to coincide with graduations on the body A, as shown in Fig. 1.

Within the casing are chambers for the reception of the time-hammer G, which is held in a forward position by a shearing-pin I, and a percussion-hammer F, held in the rear position by a shearing-pin J. An anvil below the time-hammer G will support a suitable exploder, as a cap, and has an opening communicating with a duct 3, and an anvil with a central perforation is forward of the percussion-hammer F. Between the ring C and the body A is an annular flame-chamber x , with which communicates at one point the duct 3 for an ignition or flashing charge, and at the opposite point a port 4 affords communication between the said chamber x and a segmental groove 6 in the said ring containing the fuse, the same being a composition which

ignites readily, a vent 14 permitting the escape of gases due to combustion of the ignition charge and of the fuse composition. The port 4 and the vent 14 are in close proximity to one another, so that as the gases of ignition charge pass out through the vent lighting of the fuse composition through the port is assured. A magazine-chamber y in the body A communicates, through a duct 7, with a port 8 below the groove 6, the magazine-chamber also communicating with an opening in the anvil E, which is perforated, (the perforations being closed with thin washers of paper or linen.) The percussion-hammer F is also provided with perforations, so that on the ignition of the charge in the magazine-chamber y the flame may pass therefrom through the anvil and hammer to the charge in the projectile. The vent 14 is closed by the insertion of a thin disk, and a piece of quick match or pellet v of powder is preferably inserted in said port, leading therefrom to the port 4, so as to insure a strong flash of flame at this point as the gases of the ignition charge pass through the vent.

A felt washer N is arranged to bear against one face of the ring C and a spring-washer H against the other face, the effect of the spring-washer being to force the ring frictionally against the felt washer, tending to hold it securely from turning after adjustment. As shown, the spring-washer is an annular dish-shaped plate bearing against the ring and against the lower face of the cap B and acting as a spring-packing to seal the joint.

By turning the cap the distance between the ports 4 and 8 may be increased or diminished, so that the length of fuse in the groove 6 between the said ports may be increased or diminished to vary the time required for communicating ignition from the chamber x to the contents of the chamber y .

An annular lip extends inward from the ring C to the hub of the body A and serves to prevent short circuits of the flame from the annular flame-chamber x to the channel containing fuse composition. The spring-washer

H by pressing the ring against the annular seat on the body A serves to secure a close joint to insure the above-described result.

To retain the time-hammer securely in position so that it cannot be dropped during the handling of the projectile, we make use of a safety-bar M, which extends through coinciding openings of the cap and hammer and prevents any movement of the latter until the bar is withdrawn, and we make use of this bar as a means to turn the ring C against its friction-bearings by providing a socket 9 in the periphery of the ring adapted to receive the end of the bar M. A suitable detent is used to hold the bar M temporarily in its position locking the time-hammer. As shown, the said detent is a wire ring 10, adapted to pass over the head of the cap extending through the bar M near one end and capable of being distended so as to spring down to a position below the other end of the bar, as shown. The bar may be released by again flattening the ring, swinging it over the head of the cap to the position shown in dotted lines, Fig. 1.

In order to preserve the parts and prevent the entrance of moisture between the bearings, we subject the fuse device after the parts have been assembled to a bath of a shellac solution or other liquid; which when dried will form a thin waterproof coating *t* over the whole.

It is preferable to prevent the spring-washer from rotating, which may be done by means of projections 12 upon the washer extending into recesses of the body A.

The vacant flame-chamber between the igniting charge and the fuse-train fulfils a very important function, as it assures of a more uniform rate of burning of the time-train than if the train vents directly to the exterior of the fuse. When a shell or shrapnel fitted with point-fuse is fired from the gun, especially at high velocities and from long-bore guns, the air contained in the bore of the gun forward of the projectile is greatly compressed, and if free entrance is provided to the vent-opening the rush and pressure of air are likely to extinguish the flame of the time-train. Furthermore, if the gases caused by the burning of the time-train are not provided with a chamber of suitable capacity for their expansion an abnormal accelerated rate of burning will occur. We therefore provide the annular vacant flame-chamber, into which the gases enter and expand while the shell and fuse are being expelled from and are still in the bore of the gun. When the shell and fuse issue from the mouth of the gun, the unit of air-pressure forward of the projectile is

greatly reduced and the time-train gases will blow off the vent-covering and relieve the pressure by venting to the exterior of the fuse. The flame-chamber is preferably annular, so that lighting or ignition of the time-train is assured at any setting of the train-disk.

Without limiting ourselves to the precise construction and arrangement of parts shown, we claim as our invention—

1. The combination in a time-fuse, of a setting-ring having a socket, a bar adapted to said socket, a recess in the fuse-casing for the temporary reception of the bar, and means for holding the bar in said recess, substantially as set forth.

2. The combination with a time-fuse and with the hammer thereof, of a setting-ring having a socket, a bar adapted to said socket, a recess in the fuse and in the hammer for the temporary reception of the bar, and means for holding the bar in said recess, substantially as set forth.

3. In a time-fuse, a casing having a chamber for a hammer and a recess extending through the casing and also through the hammer, combined with a bar adapted to extend through said recess to retain the hammer in place, a resilient ring connected with the bar and adapted to encircle a part of the casing, and a setting-ring having a socket adapted to receive the end of the bar, substantially as set forth.

4. In a time-fuse, a casing having a cap with a chamber for a hammer and a recess extending through the cap and also through the hammer, combined with a bar adapted to extend through said recess to retain the hammer in place, and a detent-spring ring extending through a transverse recess at the end of the bar to swing over the end of and encircle the cap and hold the bar detachably in place.

5. The combination with the casing, hammer and socketed setting-ring of a time-fuse, of a detachable bar adapted to a recess in the casing and hammer and also to the socket of the setting-ring, substantially as and for the purpose set forth.

6. A fuse for projectiles having a cap and a body portion with an annular seat, ducts for an ignition charge and a lighting charge, and a setting-ring having an annular chamber open at the top and communicating with the ignition-duct and a lip below the latter, substantially as set forth.

7. In a percussion-fuse, a body with a magazine and with a seat for an exploder, a duct containing a flashing charge communicating with said seat, a cap, a setting-ring rotatable

between the body and cap and having an annular flame-chamber communicating with the duct, and a curved fuse-chamber communicating with the flame-chamber and with
5 the magazine, substantially as set forth.

8. A time-fuse provided with an exploder, a duct for a flashing charge extending to the exploder, a chamber for fuse composition, a train-ring with a lip, a vacant flame-chamber
10 above the lip and between the duct and fuse-chamber, the flame-chamber open at the top,

and a vent-port communicating with said chamber, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of 15 two subscribing witnesses.

JOHN F. MEIGS.
EMIL A. GATHMANN.

Witnesses:

EDWIN A. MILLER,
R. E. GRAVER.