

No. 699,577.

Patented May 6, 1902.

W. RUEGG.

PROJECTILE AND TIME FUSE THEREFOR.

(Application filed Jan. 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.

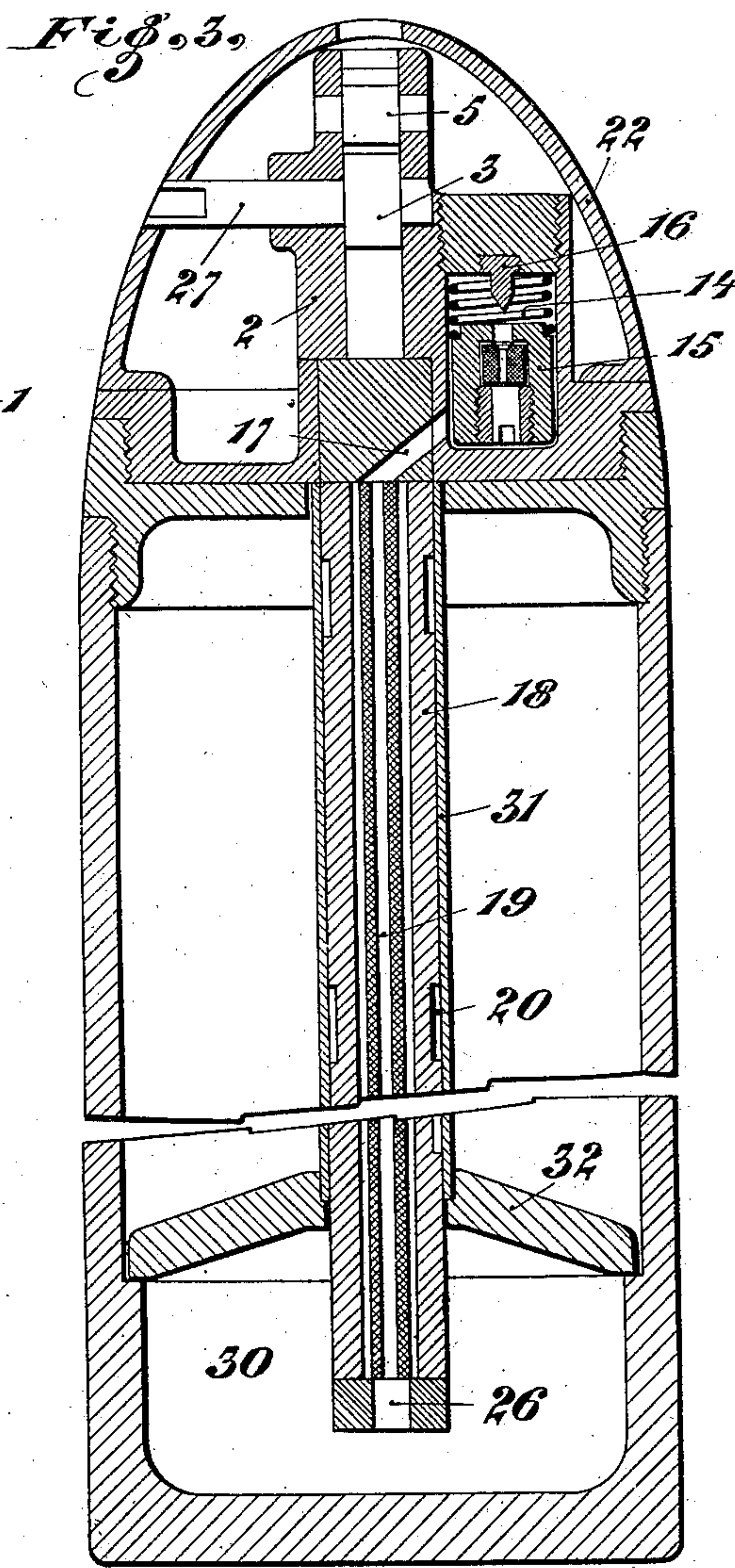
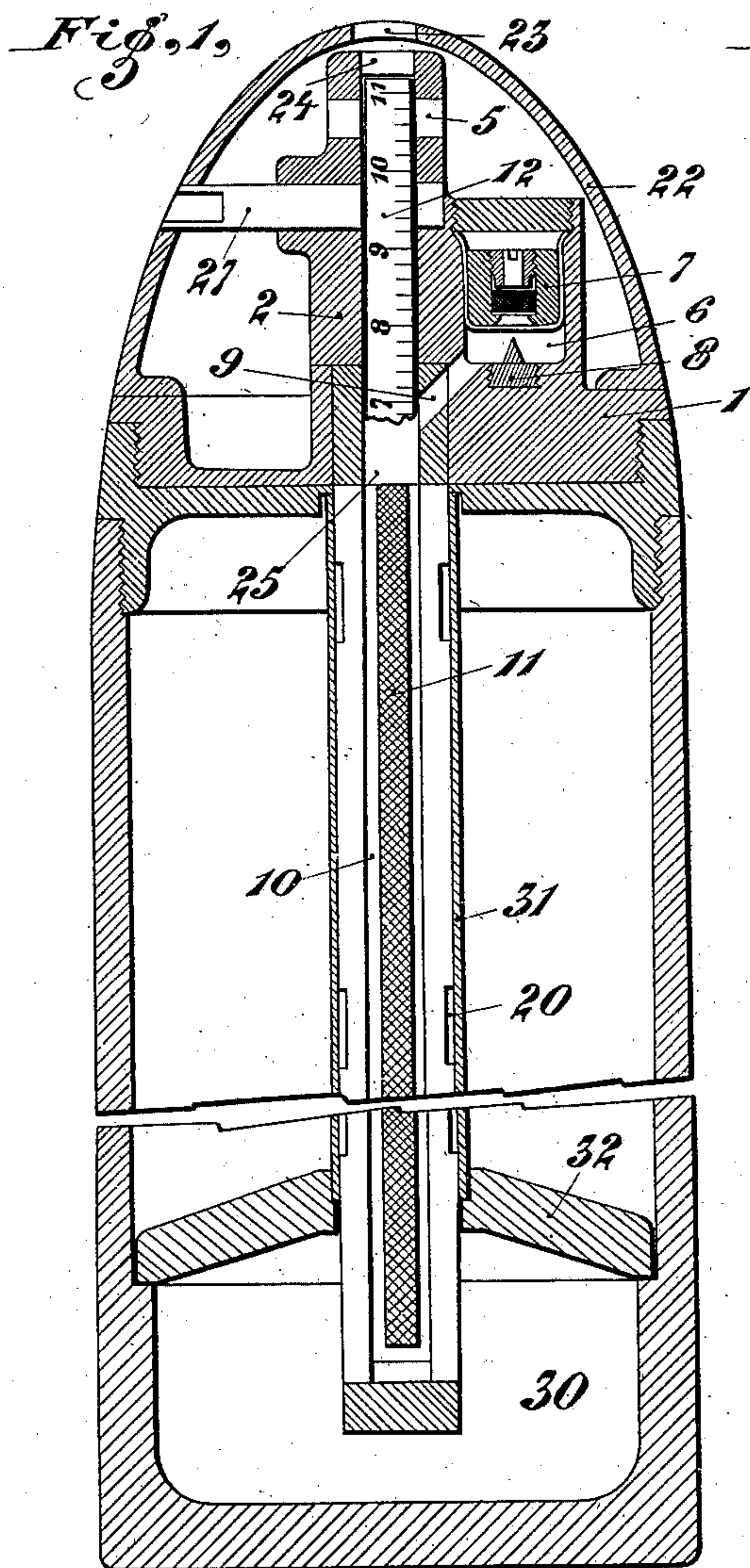
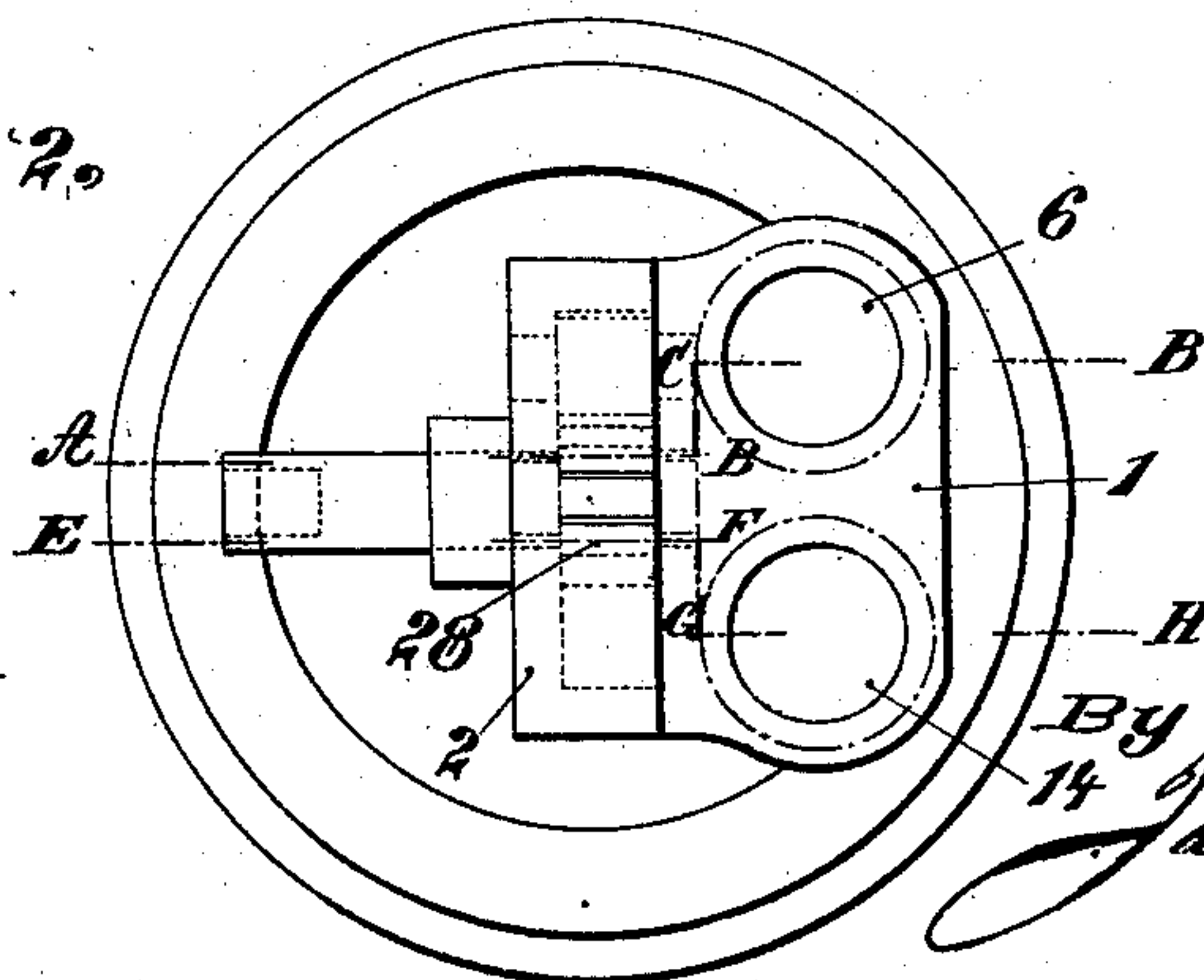


Fig. 2,



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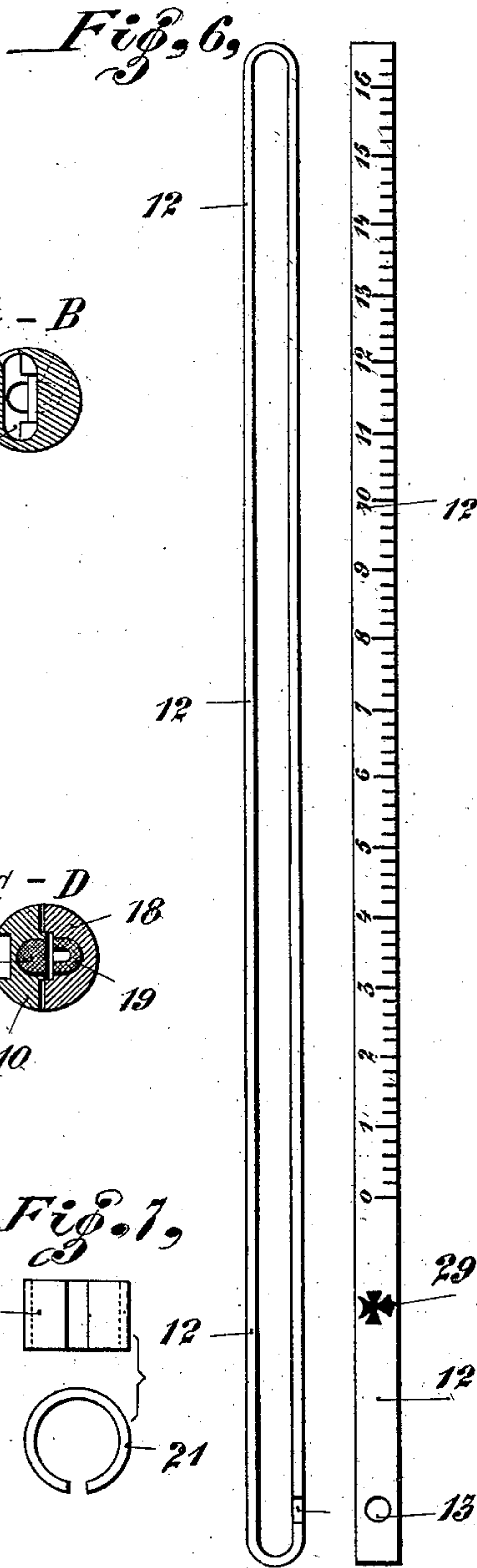
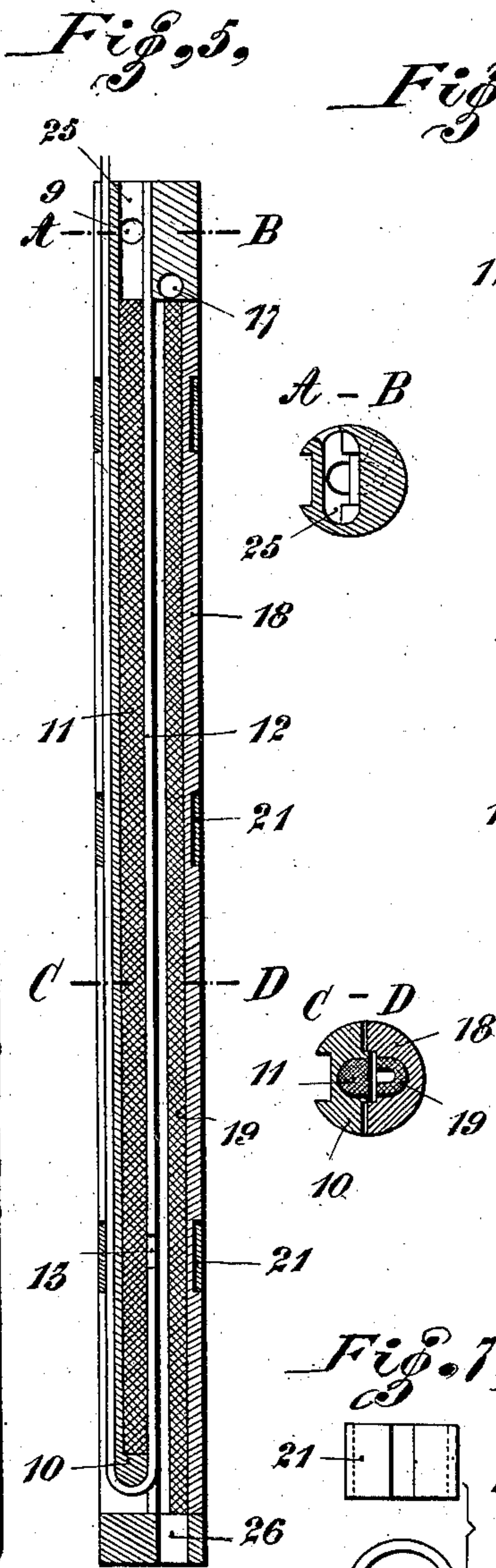
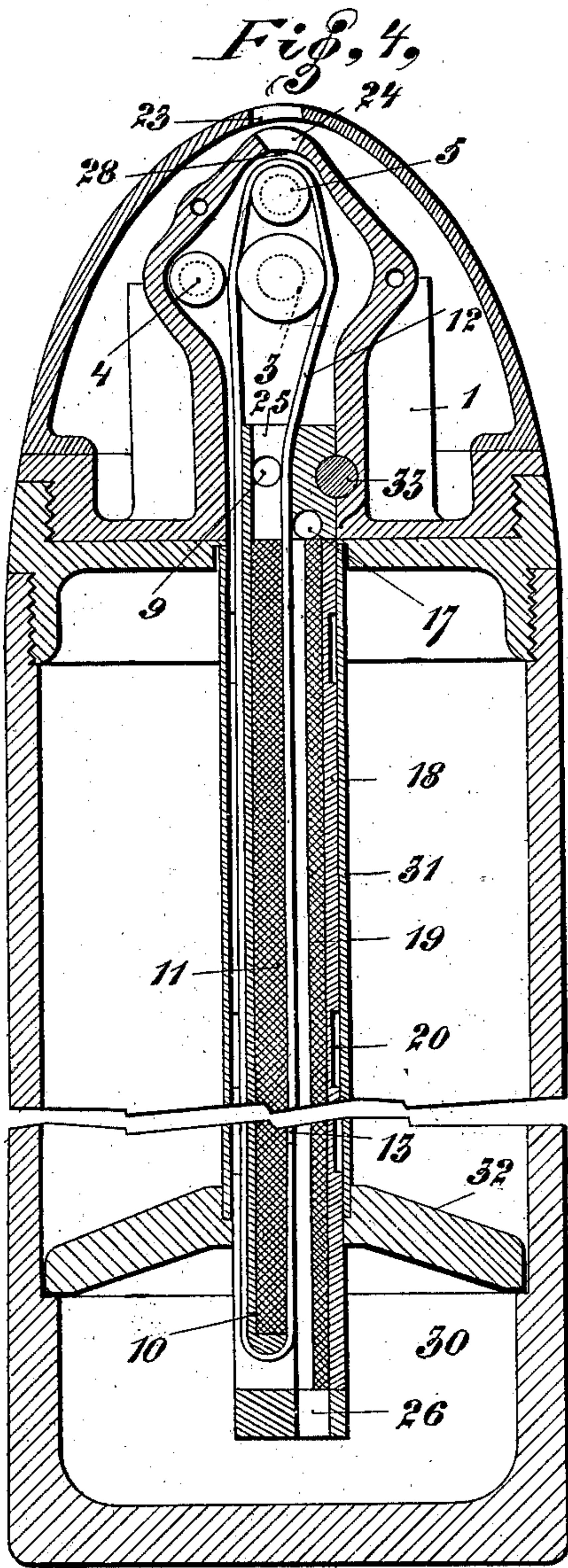
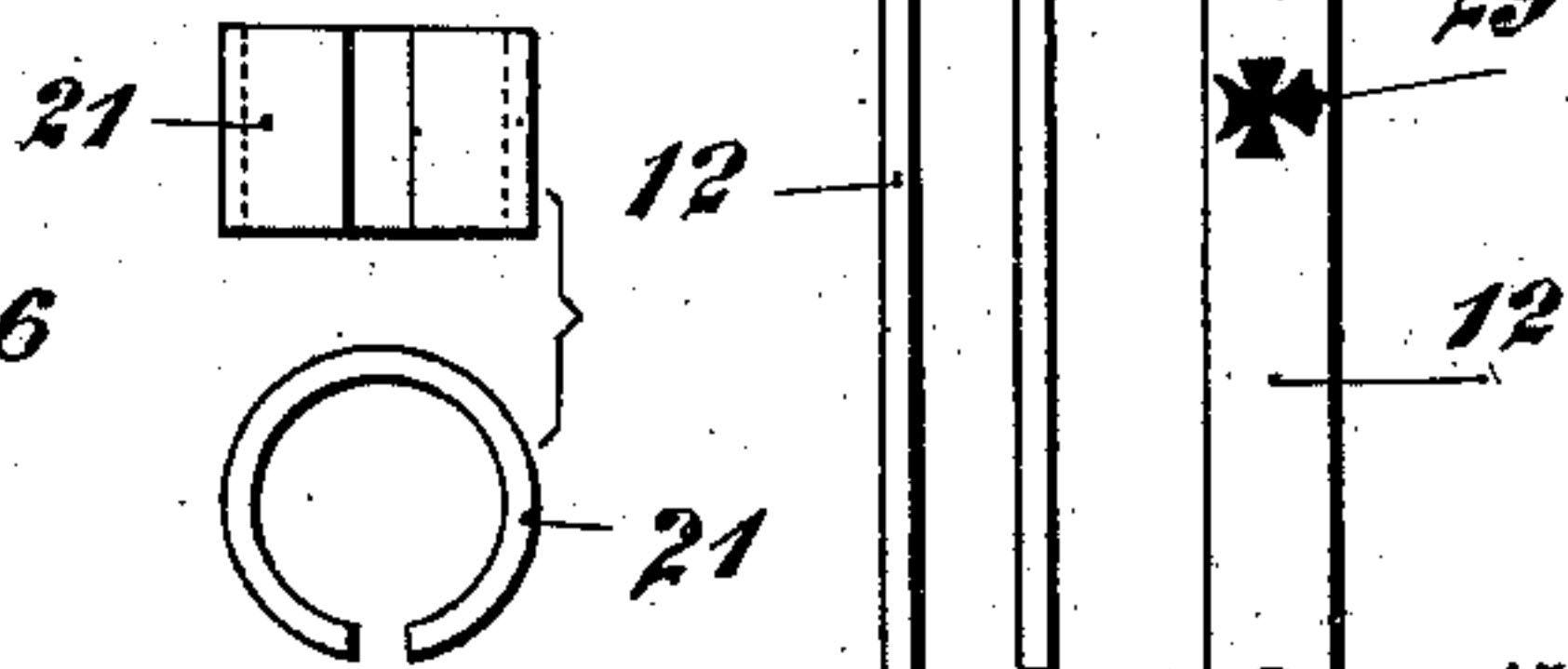


Fig. 7,



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UNITED STATES PATENT OFFICE.

WERNER RUEGG, OF SÖMMERDA, GERMANY.

PROJECTILE AND TIME-FUSE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 699,577, dated May 6, 1902.

Application filed January 2, 1902. Serial No. 88,221. (No model.)

To all whom it may concern:

Be it known that I, WERNER RUEGG, engineer, a citizen of Switzerland, residing at Dreyseplatz 11, Sömmerda, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Projectiles and Time-Fuses Therefor, of which the following is a specification.

My invention relates to a fuse for projectiles in which the compressed powder charge is not, as is usual, arranged in a concentric annular manner, but in the form of a straight rod or strip in the longitudinal axis of the fuse and projectile, and it refers particularly to a timing device for the fuse, with an endless band also arranged in the longitudinal axis of the projectile and forming the means for regulating the time of ignition. This band is provided with a touch-hole and with a scale upon which is indicated the various burning periods, according to the adjustment of the band. The arrangement is made, preferably, so as to place the powder charge of the time-fuse charge, as well as that of the fire-transmitting portion, the former in the form of a rod or strip and the latter in the form of a part cylinder hollow toward the band, parallel to each other upon each side of the band, so that the latter, which is movable between them, is capable of effecting the timed ignition through the touch-hole, according to its adjusted position in the device.

In the drawings is shown a practical construction of a fuse provided with a single powder-strip; but it is obvious that several powder rods or strips could be arranged parallel to each other in case the timing required more than one strip.

Figure 1 is a longitudinal section of a fuse inserted into a shrapnel-shell, the section being taken on the line A B C D of Fig. 2. Fig. 2 is a plan view of a shell with the cover 22 removed to show the interior. Fig. 3 shows a section of the shell on the line E F G H of Fig. 2. Fig. 4 is a sectional elevation of the shell, and Figs. 5, 6, and 7 are details of the fuse device.

The fuse of the present construction is like the fuses used up to the present time as a double fuse, and therefore is provided with a timing device, as well as with a percussion primary apparatus.

The fuse-casing 1, provided with a cover or extension 2, Figs. 1 to 4, contains in openings 6 and 14 the time fusing and percussion primary devices 7 15.

In order to connect the projectile with the casing, the latter is provided with a screw-threaded flange.

In a groove in the fuse-composition holder 10 is arranged the highly-compressed powder rod or strip 11. The fuse-composition holder 10 is provided at its upper and lower ends with heads, the upper of which serves, in the first place, for connecting the fuse-composition holder with the casing 1. Moreover, this head is provided with borings 9 and 17, adapted to transmit the fire from the time and percussion composition, and with a longitudinal groove 25, through which the products of combustion of the burning powder-strip can escape into the hollow space of the fuse-casing 1. The connection of the head with the cylinder-casing is effected by means of a riveted pin or key 33, Fig. 4.

The lower head of the fuse-holder 10 serves as a support for the fire-transmitting portion 18. This head is provided with the touch-hole 26, through which the fire can strike from the composition-channel 19 to the powder in the explosion-chamber 30.

The passage of the fire from the powder-strip 11 and from the percussion priming composition 15 to the explosive charge is effected through the fire-transmitting part 18, Fig. 5, which contains in a longitudinal groove the semicylindrical powder composition 19, forming a channel which is in connection with the timing device or with the powder-strip 11 by means of the fire-transmission hole 13 in the band 12 and through the passage 17 with the percussion priming device.

The parts 10 and 18 are secured together by clamping-rings 21 and by a sleeve 31, which rests at its lower end upon a spring cushion or washer 32. The clamping-rings 21 are situated in grooves 20. The parts are divided by the inserted endless band 12, Figs. 4 and 6, which consists of two layers. The external surface is formed by a thin metal band provided with a graduated scale for the time-fuse, while upon its inner side this band is provided with a strip of felt or cloth for

the purpose of preventing the powder-gases of the burning powder-strip 11 from escaping. At a convenient point this band is provided with a fire-transmission hole 13.

5 On firing the time-fuse composition 7, Figs. 1 and 4, is thrown against the pin 8, whereby the charge in the time fusing composition is ignited. The fire finds a passage through the channel 9 to the holder 10, the powder-strip 11 of which is immediately ignited and
10 burns down to the opening 13 in the band 12, Figs. 4 and 5. At this point the fire is transmitted to the fuse composition 19 in the part 18, from which it passes without retardation
15 downward into the explosion-chamber 30, the explosive charge of which is thus ignited.

The hole 13 in the band can be adjusted with regard to the strip 11 at will. To this end the band can be displaced by turning
20 the roller 3 in one or the other direction, thus effecting a shorter or longer burning period of the fuse. The turning of the roller 3 is effected by the rotation of a key engaging the extended axis 27 of the roller, Figs. 1 and 3,
25 which thus moves the band, which passes between the roller 3 and a second roller 4. To facilitate the adjustment of the band with regard to the various burning periods, it is guided over a guide-roller 5 as closely as
30 possible to the upper end of the cover 22. A hole 23 in the cover allows of an inspection of the scale on the band, while the slot 24 in the casing 1 or the edge 28 allow of an excellent adjustment of the scale-band.

35 If it is intended to cause the projectile to explode not above but on striking the ground, the band 12, which normally is adjusted to the mark 29, Fig. 6, is not readjusted. The fire-transmitting hole 13 in the band 12 does
40 not then lie between the strip 11 and the passage 19, but above the hole 25. Upon exploding, the timing composition acts in the usual manner and the powder-rod 11 burns away slowly. As, however, the hole 13 is ar-
45 ranged above the strip 11, the fire cannot pass to the composition-passage 19 thereof, and no explosion of the explosive charge can be effected by the time fuse composition. When,
50 however, the projectile strikes the ground or object, the percussion-priming composition is brought into action by the fusing-pin 15 being thrown forward against the pin 16, so that the composition is ignited. The fire then strikes
55 through the fire-conducting channel 17 into the composition-channel 19 and from here into the explosion-chamber 30, whereby the charge is exploded.

Having now particularly described and ascertained the nature of this invention and in
60 what manner the same is to be performed, I declare that what I claim is—

1. In a time-fuse for projectiles, a fuse-holder arranged in the direction of the axis of the projectile, a time fusing composition ex-
65 tending in the direction of the axis of the projectile and arranged in said holder, a band extending in the holder surrounding said com-

position and provided with a hole for the pas-
70 sage of fire from said composition when it is ignited, and a fusing composition arranged in said holder and adapted to be ignited by the passage of fire from the time fusing compo-
75 sition through the opening in said band.

2. In a time-fuse for projectiles, a fuse-holder arranged in the direction of the axis of
75 the projectile, a time fusing composition extending in the direction of the axis of the projectile and arranged in said holder, an adjustable band extending in the holder surround-
80 ing said composition and provided with a hole for the passage of fire from said composition when it is ignited, and a fusing composition arranged in said holder and adapted to be
85 ignited by the passage of fire from the time fusing composition through the opening in said band.

3. In a fuse for projectiles, a time fusing composition and a fusing composition suit-
90 ably arranged within the projectile, a band surrounding the time fusing composition for separating the same from the fusing composition, said band provided with an opening to per-
95 mit of the passage of fire from the time fusing composition to the fusing composition, and means for igniting the time fusing composi-

4. In a fuse for projectiles, a time fusing composition and a fusing composition suit-
100 ably arranged within the projectile, an adjustable band surrounding the time fusing composition for separating the same from the fusing composition, said band provided with an opening to permit of the passage of fire
105 from the time fusing composition to the fusing composition, and means for igniting the time fusing composition.

5. In a fuse for projectiles, a time fusing composition and a fusing composition suit-
110 ably arranged within the projectile, a band surrounding the time fusing composition for separating the same from the fusing composition, said band provided with an opening to permit of the passage of the fire from the
115 time fusing composition to the fusing composition, means for adjusting the said band, and means for igniting the time fusing composition.

6. In combination with a projectile, a com-
120 pressed powder-strip suitably arranged therein and extending in the direction of the axis of the projectile, a band surrounding the said strip and provided with an opening for the passage of fire therefrom, a semicylindrical mass of combustible material arranged in the
125 projectile and extending in the direction of the axis thereof and adapted to be ignited by the passage of fire through said opening in said band, and means for igniting the said strip.

7. In combination with a projectile, a time
130 fusing composition arranged therein, a fusing composition arranged in the projectile and adapted to be ignited by said time fusing composition, means for igniting the latter, means

extending in the projectile and separating the fusing composition from the time fusing composition and provided with an opening to permit of the passage of fire from the time fusing composition to the fusing composition when the former is ignited.

8. In combination with a projectile, a time fusing composition arranged therein and extending in the direction of the axis thereof, a fusing composition arranged in the projectile and extending parallel with the time fusing composition, means for igniting the time fusing composition, and means arranged in the projectile to permit of the passage of fire from the time fusing composition to the fusing composition.

9. In combination with a projectile, of a holder arranged therein and extending in the direction of the axis thereof, said holder communicating by an opening at its lower end with the explosion-chamber of the projectile, a time fusing composition arranged in the said holder, a fusing composition mounted in said holder and communicating with the opening in the bottom thereof, means for igniting the time fusing composition, and means extending in the holder for separating the time fusing from the fusing composition and to permit of the passage of fire from the time

fusing composition to the fusing composition for igniting the latter.

10. In combination with a projectile, a fusing-composition strip arranged therein, a semicylindrical fusing mass arranged parallel to the said strip, an adjustable band extending between the said mass and strip and provided with an opening to permit of the passage of fire from said strip to said mass, and means connected with the projectile to permit of suitably adjusting the said band.

11. In combination with a projectile, a time fusing composition arranged therein, a fusing composition arranged parallel with the time fusing composition, both of the said compositions extending in the direction of the axis of the projectile, and means for adjusting the burner period of said timing composition, the displacement of the said means being effected parallel to the longitudinal axis of the projectile.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WERNER RUEGG.

Witnesses:

MAX MEYER,
ALEX. PIETZSCHY.