

W. C. THORNHILL.
ELECTRIC IGNITER FOR EXPLOSION ENGINES.
APPLICATION FILED AUG. 26, 1907.

929,262.

Patented July 27, 1909.

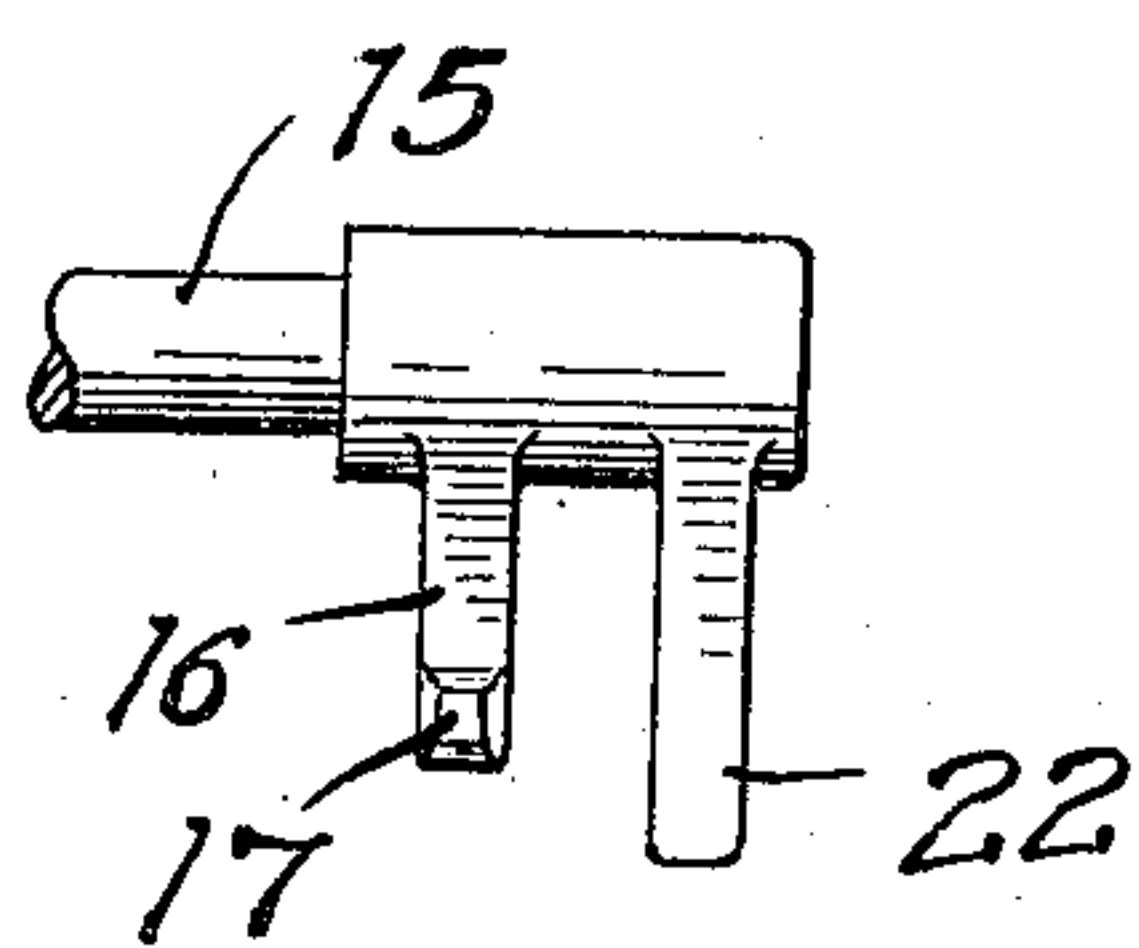
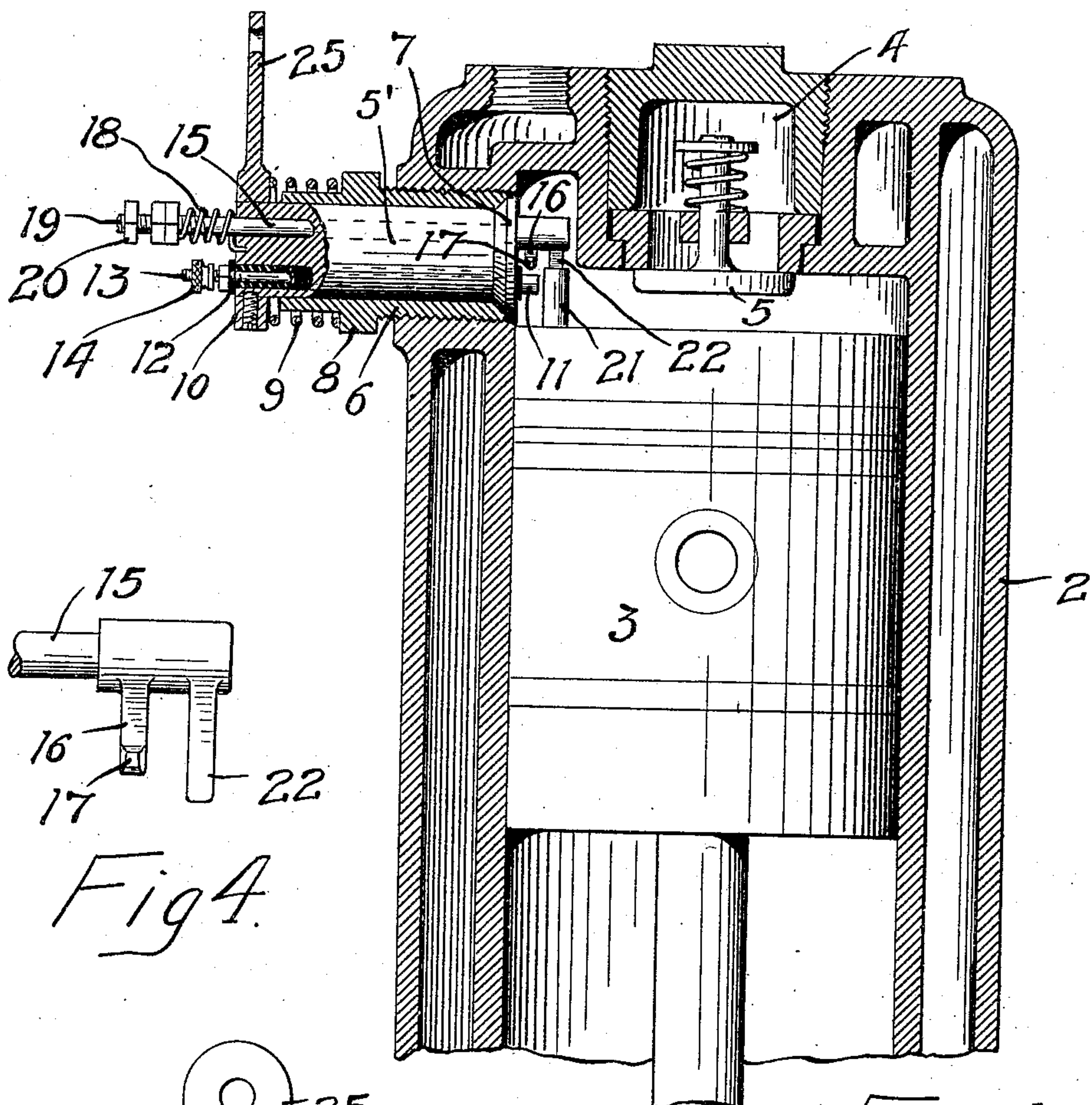


Fig 4.

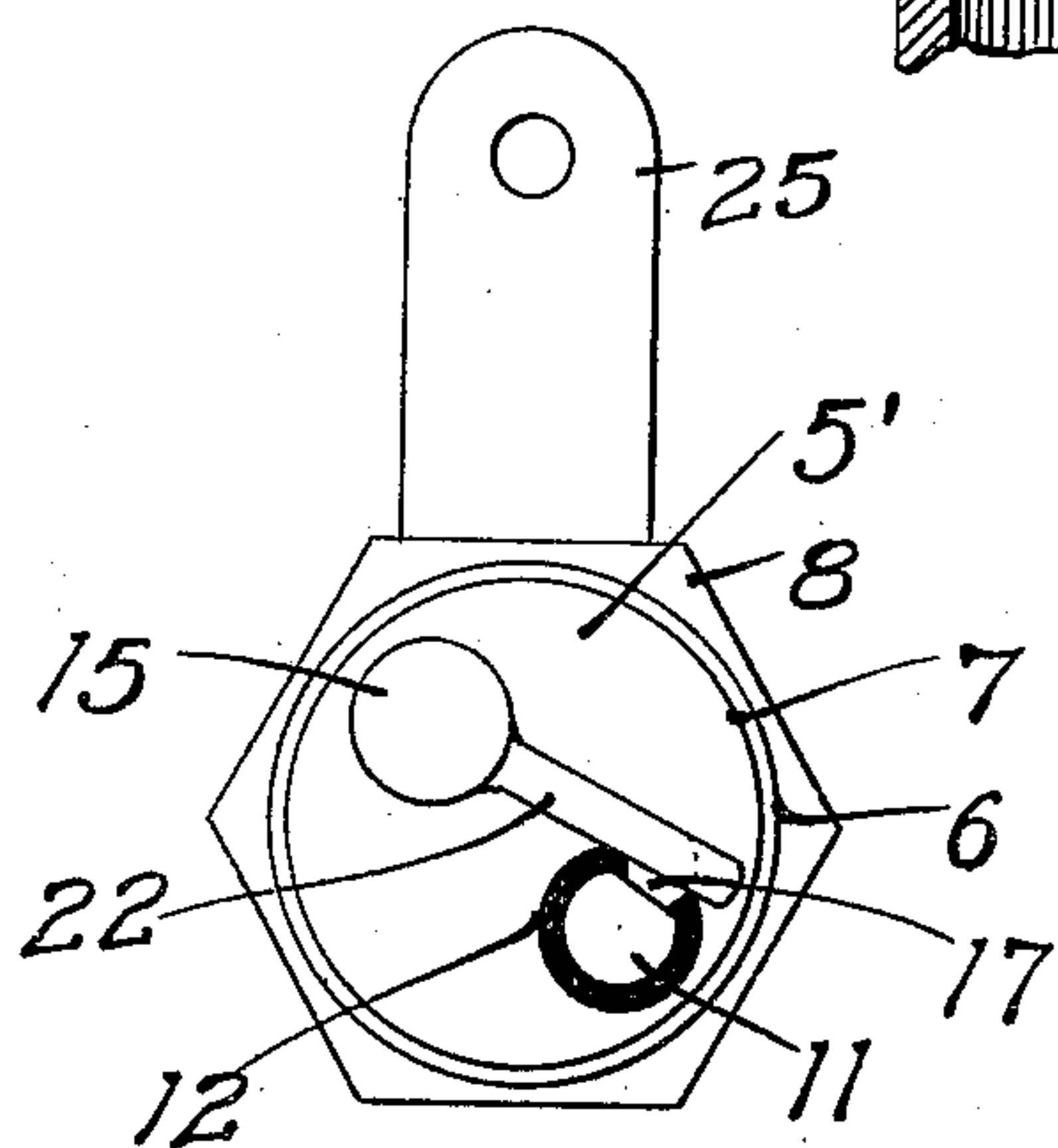


Fig 3.

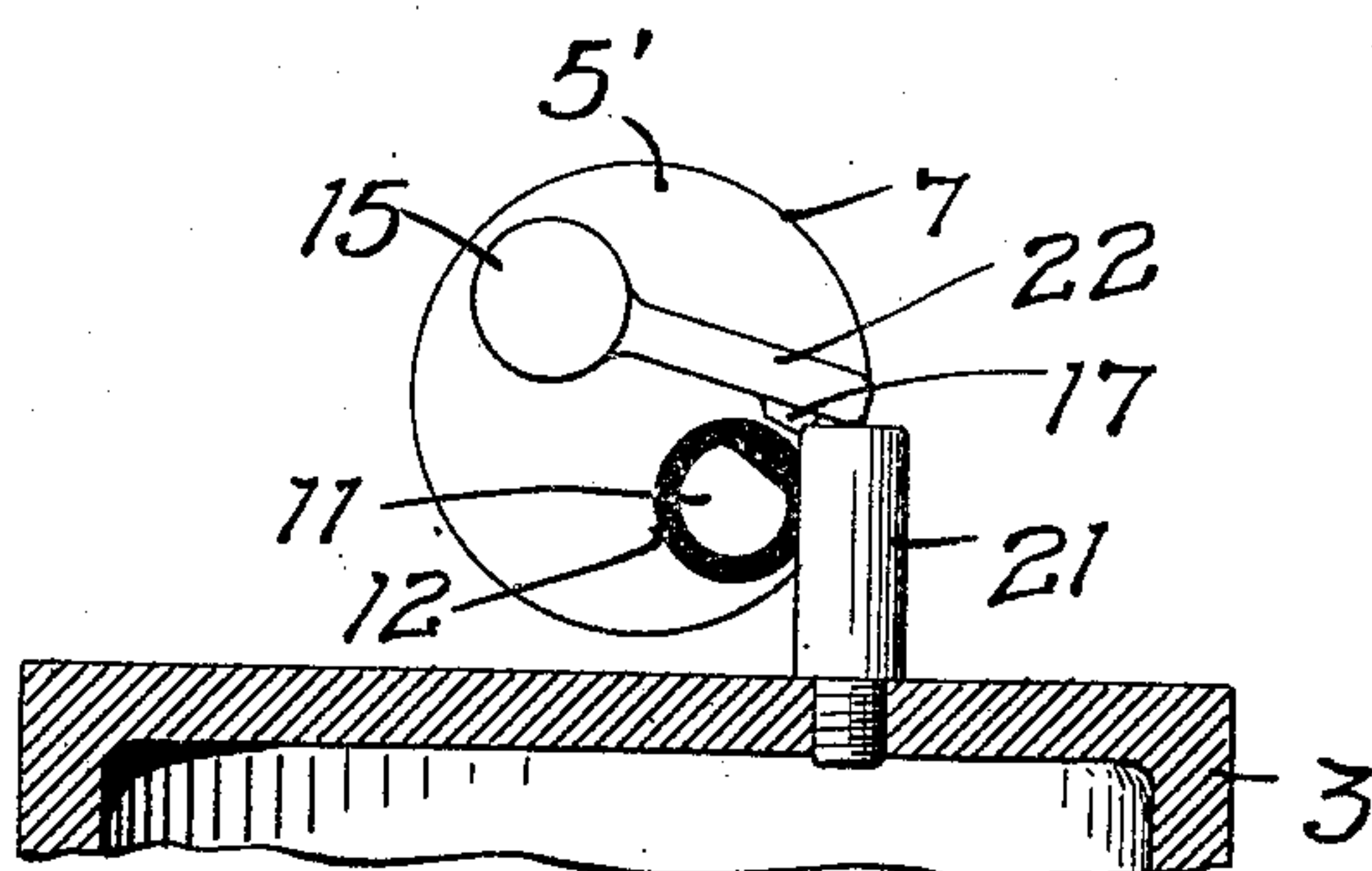


Fig 2.

WITNESSES
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UNITED STATES PATENT OFFICE.

WALTER C. THORNHILL, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO
CHARLES W. GARDNER, OF MINNEAPOLIS, MINNESOTA.

ELECTRIC IGNITER FOR EXPLOSION-ENGINES.

No. 929,262.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed August 26, 1907. Serial No. 390,135.

To all whom it may concern:

Be it known that I, WALTER C. THORNHILL, a citizen of the United States, residing at Minneapolis, Hennepin county, State of Minnesota, have invented new and useful Improvements in Electric Igniters for Explosive-Engines, of which the following is a specification.

The object of this invention is to provide an electric igniter for explosive engines in which a spark is formed at each reciprocation of the piston by the moving of one electrode away from the other.

The invention consists generally in providing a rotatable carrier extending through the wall of the engine cylinder and carrying a fixed and a movable electrode with means whereby the electrodes are separated at each reciprocation of the piston.

The invention consists further in the constructions and combinations hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a longitudinal section of a portion of an explosive engine cylinder showing a piston arranged therein and showing my invention applied thereto. Fig. 2 is a detail showing the manner of separating the electrodes. Fig. 3 is a detail showing the electrodes in connection with each other. Fig. 4 is a detail of the movable electrode.

In all of the drawings, 2 represents the engine cylinder and 3 the reciprocating piston therein. A suitable inlet port 4 having a valve 5 is provided and this port and valve may be of any preferred construction and arrangement. I provide a rotatable carrier 5' mounted preferably in a threaded sleeve 6 and having at its inner end a collar 7 that makes a gas tight joint with the inner end of the sleeve 6. This sleeve is preferably provided with a shoulder 8 and a spring 9 engages this shoulder and also engages a ring 10 secured to the outer end of the cylindrical carrier 5'. This spring tends to hold the collar 7 against the inner end of the sleeve 6 and it also provides sufficient tension upon the carrier to prevent it from being suddenly displaced or rotated.

In the carrier 5', I provide the fixed electrode 11 which is insulated from said carrier by a suitable packing 12. This electrode is provided with a threaded outer end 13 hav-

ing lock nuts 14 by means of which a suitable wire may be connected to said electrode. A movable electrode 15 is also provided and this carries at its inner end the contact arm 16, the point 17 of which is adapted to engage the inner end of the fixed electrode 11. A spring 18 surrounds the outer end of the electrode 15 and tends to hold the point 17 in contact with the fixed electrode. The electrode 15 I also provide with a threaded outer end 19 and with suitable nuts 20 by means of which a suitable wire or conductor may be connected to said electrode.

The end of the piston 3 is provided with a projection 21 and at each reciprocation of the piston, as it approaches the end of its stroke, the projection 21 comes in contact with an arm 22 on the electrode 15, and moves the contact point 17 out of engagement with the fixed electrode 11, thereby causing a spark between said electrodes and igniting any charge of gas there may be in the cylinder.

When it is desired to advance or retard the time of the forming of the spark in respect to the reciprocation of the piston, the carrier 5' is rotated upon its axis by means of the arm 25 secured to the outer end of said cylindrical carrier. This arm may be connected to a suitable operating lever in convenient position to be controlled by the operator of the machine.

In a multiple cylinder engine all of the arms on the cylindrical carriers will be connected to and operated by a single lever. By rotating the arm in one direction, the projection 22 is brought nearer to the end of the piston 3 so that the spark is formed when the end of the piston is at a greater distance from the end of the cylinder. By rotating the carrier in the opposite direction, the projection 22 is carried farther away from the end of the piston so that the spark is formed when the end of the piston has traveled nearer to the end of the cylinder. In this way, the spark may be advanced or retarded by the operator at will.

I do not limit myself to the details of construction, as the same may be varied in many particulars, without departing from my invention.

I claim as my invention:

1. The combination, with an explosive engine, of a rotatable carrier mounted in the wall thereof, with its axis substantially at

right angles to the line of movement of the engine piston, a stationary electrode mounted in said carrier, a movable spring influenced electrode carrying an arm positioned to be
5 engaged by a part of the piston and also an arm to contact with the stationary electrode and mounted in the same carrier with the stationary electrode, and means on the piston for engaging the movable electrode and ro-
10 tating the same on its axis and thereby moving it away from the stationary electrode, substantially as described.

2. The combination, with an explosive engine, of a sleeve mounted in the wall of the
15 engine with its axis substantially at right angles to the line of movement of the piston, a carrier capable of being moved in said sleeve and having at its inner end a collar

bearing against the end of the sleeve, a spring exerting its pressure on said carrier 20 to hold its collar in close contact with the end of the sleeve and offer resistance to its rotation, a fixed electrode mounted in said carrier, and a movable spring influenced
25 electrode mounted in said carrier and provided with an arm positioned to be engaged by a part of the piston and also with an arm to contact with the fixed electrode, substantially as described.

In witness whereof, I have hereunto set 30 my hand this 22nd day of August 1907.

WALTER C. THORNHILL.

Witnesses:

C. G. HANSON,
J. B. BYINGTON.