

No. 881,684.

PATENTED MAR. 10, 1908.

W. B. HAYDEN.
SPARK PLUG.

APPLICATION FILED JUNE 7, 1907.

Fig. 1.

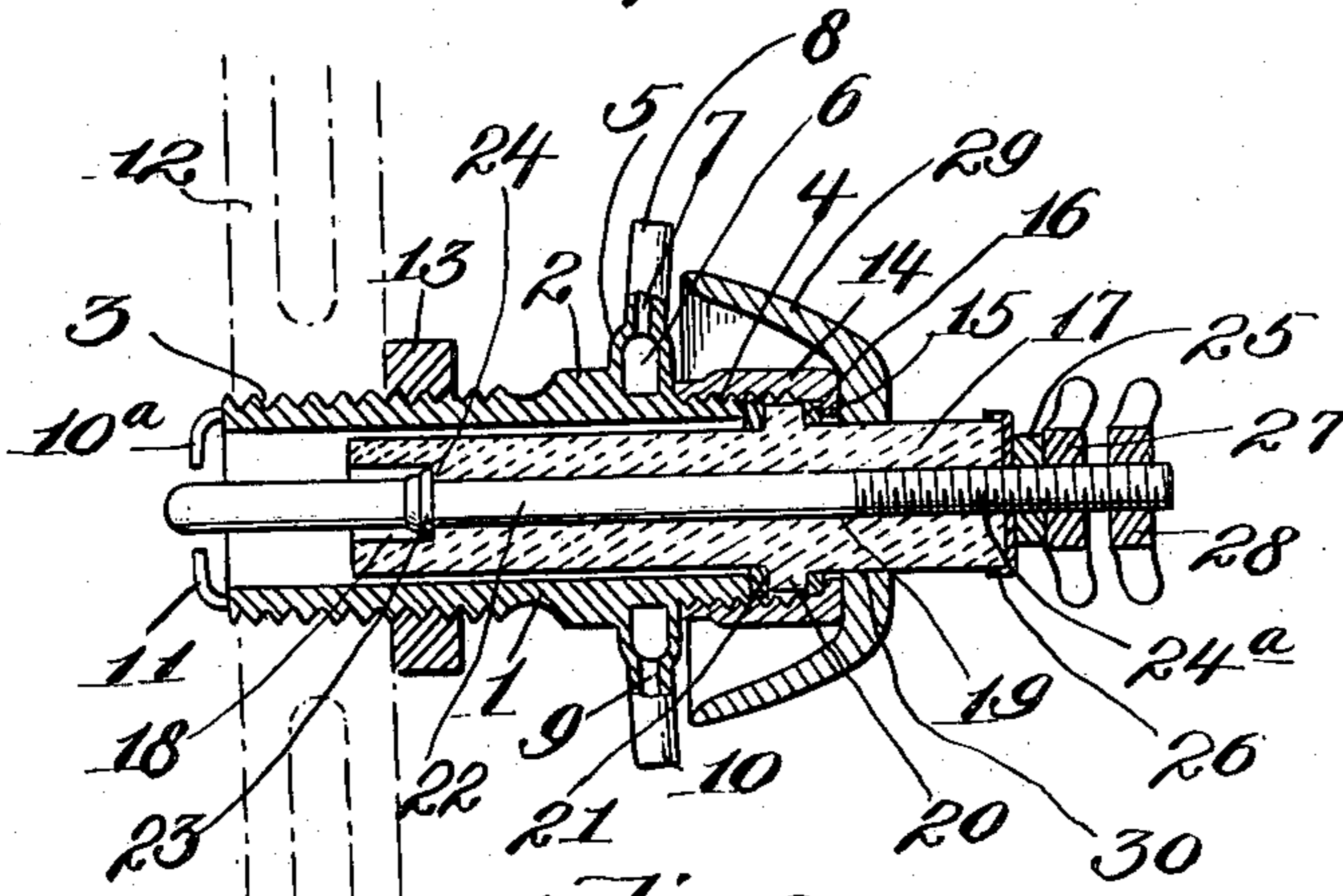


Fig. 2.

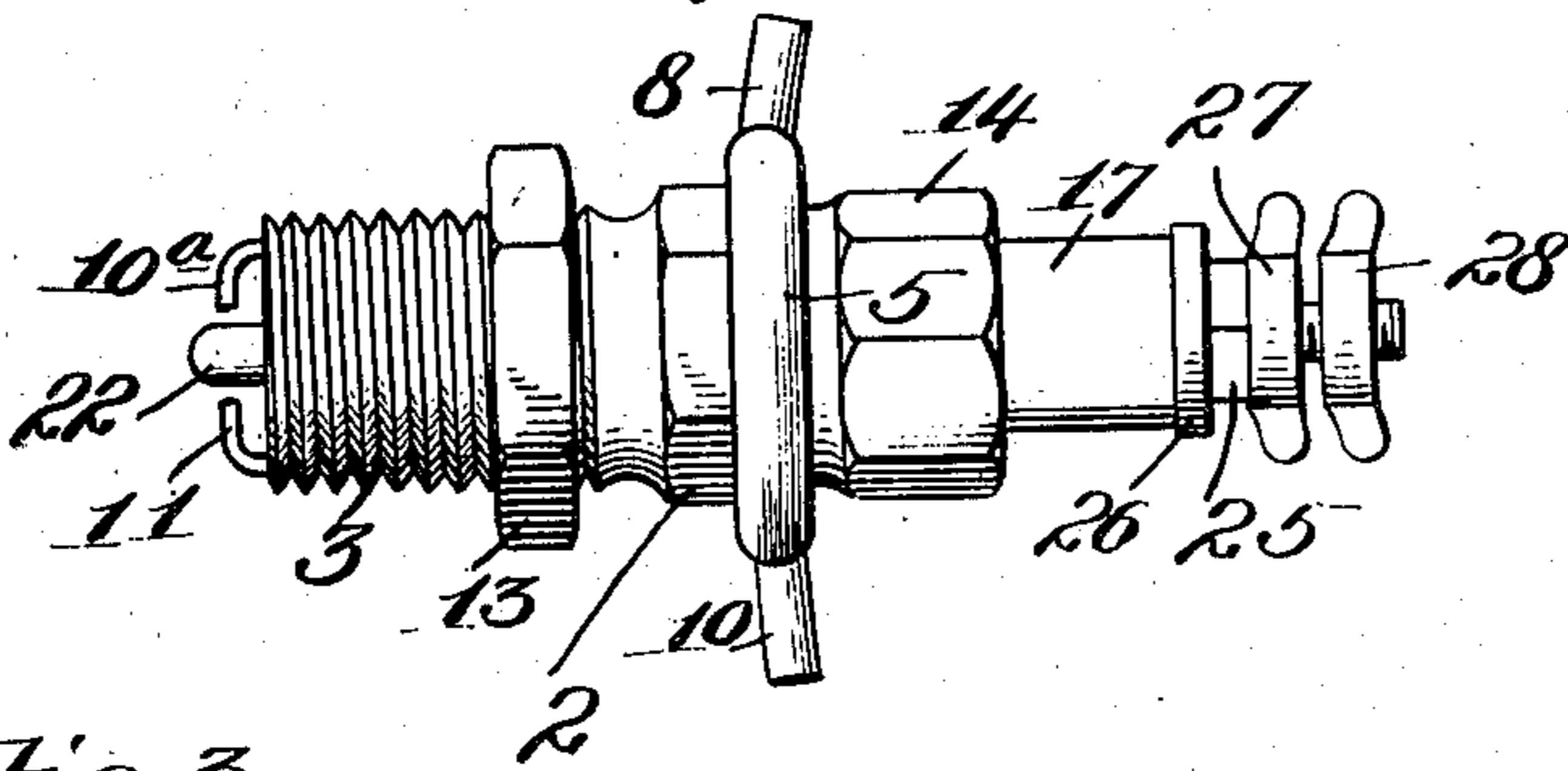


Fig. 3.

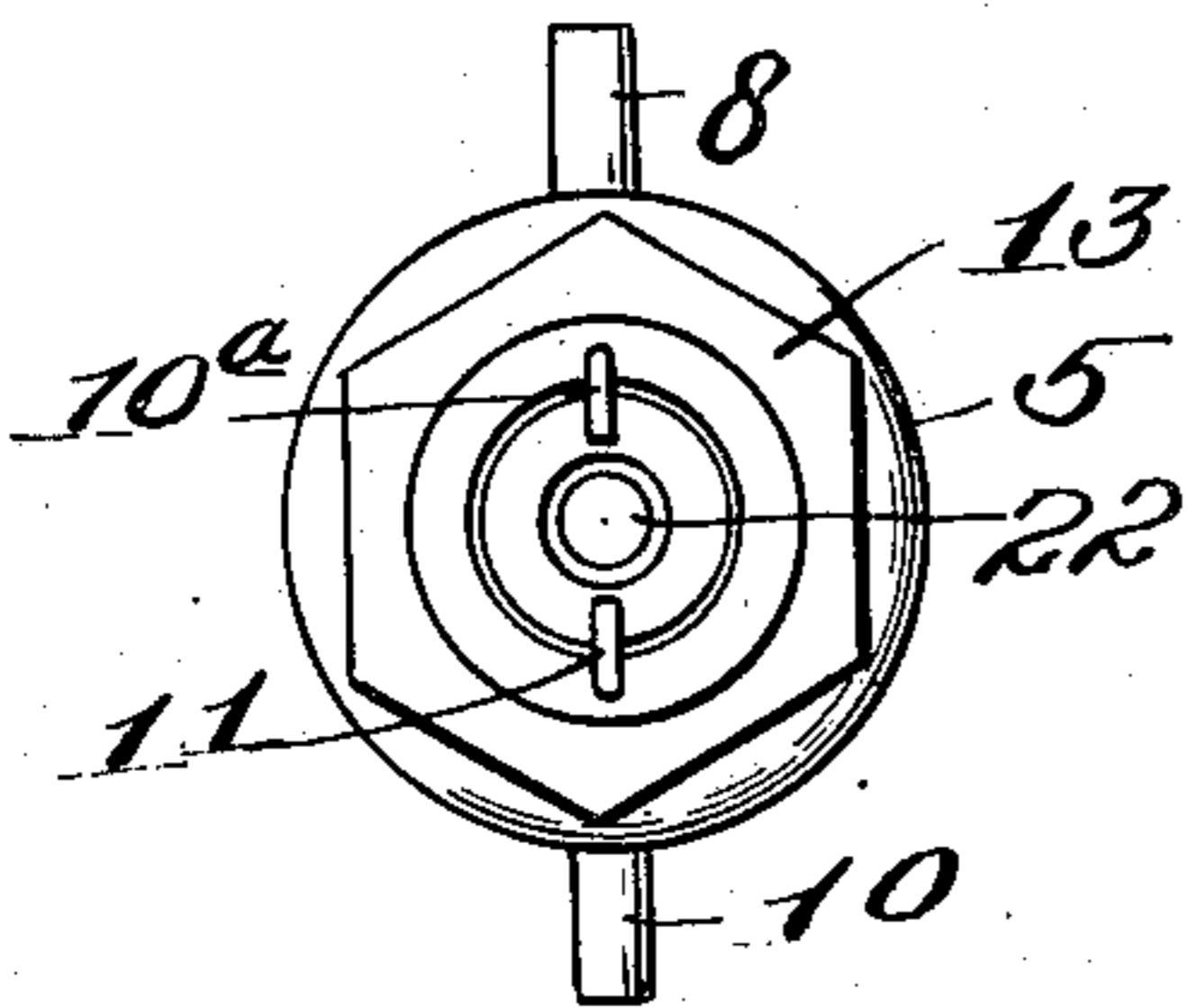
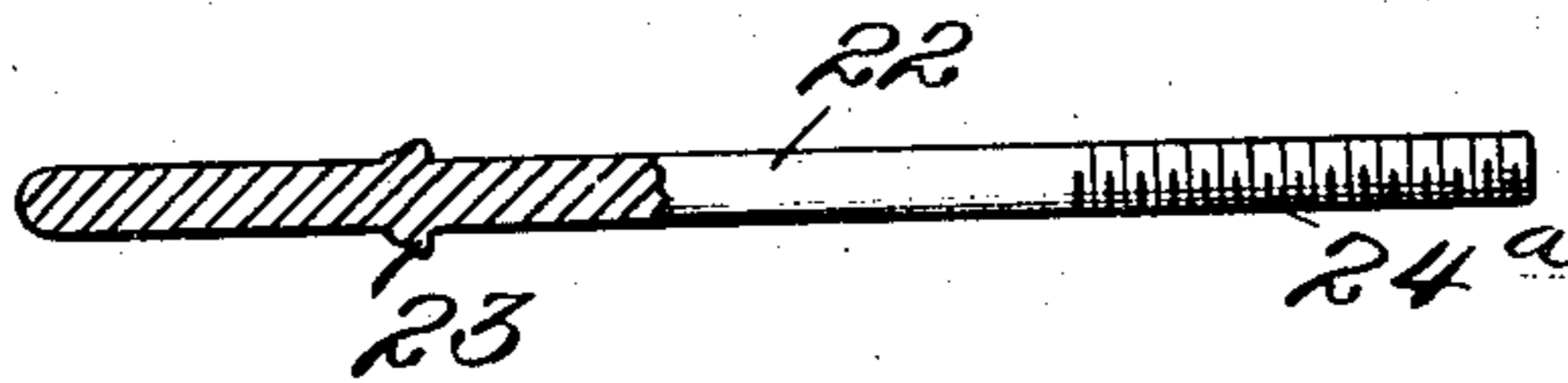


Fig. 4.



Witnesses:

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SPARK-PLUG.

No. 881,684.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed June 7, 1907. Serial No. 377,795.

To all whom it may concern:

Be it known that I, WILLIAM B. HAYDEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Spark - Plugs, of which the following is a specification.

This invention relates to three-terminal spark plugs for use in connection with explosive engines and one of the objects thereof is to provide the plug with a shield in a manner as hereinafter set forth to prevent short-circuiting and to further so arrange the shield as to enable the removing of the plug without dismounting of the shield and to further allow of the connecting and disconnecting of the circuit wire connection to the plug without necessitating the removal of the shield.

A further object of the invention is to provide the plug with an electrode rod in a manner as hereinafter set forth so that the said rod can be conveniently positioned and furthermore carrying means whereby it will be fixedly retained in position.

A further object of the invention is to provide a three-terminal plug with means for securing compression and also with means independent of the water jacket of the cylinder of the engine for cooling the plug.

The invention further aims to provide a three-terminal spark plug for explosive engines which shall be simple in its construction, strong, durable, efficient in its use, readily set up, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts hereinafter more specifically described and illustrated in the accompanying drawings wherein is shown the preferred embodiment of the invention, but it is understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail, reference is had to the accompanying drawings, wherein like reference characters denote corresponding parts throughout the several views, and in which:—

Figure 1 is a longitudinal sectional view of a three-terminal spark plug in accordance with this invention. Fig. 2 is a side elevation thereof with the shield removed. Fig. 3 is an end view looking towards the inner end

of the plug, and Fig. 4 is a detail showing the electrode rod.

Referring to the drawings by reference characters, 1 denotes the inner section of the plug which is formed with a peripheral shoulder 2, provided with exterior threads as at 3, 4 and further having a hollow annular off-set 5 which constitutes a chamber 6 for receiving a cooling medium. The off-set 5 is formed with an inlet 7 which communicates with a cooling medium supply pipe 8 and said off-set 5 is furthermore provided with an outlet 9 which communicates with a discharge pipe 10. The inner end of the section 1 is provided with a pair of fixed electrodes 10^a, 11, which project towards each other, but are suitably spaced apart. The section 1 of the plug is adapted to be secured to the cylinder 12 of the engine, with the inner end of said section extending into the combustion chamber of the engine. Mounted upon the screw-threaded portion 3 of the section 1 is a compression nut 13 which when screwed home fixedly secures compression. The plug further comprises an outer section 14 which is interiorly screw-threaded and is adapted to be connected to the screw-threaded portion 4 of the section 1. The outer section 14 at its outer end is provided with an inwardly extending annular flange 15, against which is seated a packing 16.

Arranged within the sections 1, 14 and projecting from the section 14 is a cylindrical body of insulating material 17 formed with a bore which extends entirely there-through and the said bore is formed of two different diameters, the larger of which is arranged at the inner end of the body 17 and is indicated by the reference character 18. That portion of the bore of smaller diameter is indicated by the reference character 19. The insulated body 17 is formed with an annular shoulder 20 which abuts against the packing 16 and also abuts against the packing 21 which is interposed between the shoulder 20 and the outer end of the section 1. The section 14 when screwed home is adapted to secure the body 17 in position.

Extending through the bore of the cylindrical body 17 is an electrode rod 22, which is of such length as to project from the outer end of the body 17 and also to extend between and past the electrodes 10, 11. The electrode rod 22 at its inner end is off-set as at 23 so as to form an abutment which is adapted to engage the shoulder 24 formed at

the inner end of that portion of the bore of larger diameter. The outer end of the electrode rod 22 is screw-threaded as at 24^a, and upon such screw-threaded portion is mounted a binding nut 25 which is adapted to abut against a cap piece 26 carried on the outer end of the cylindrical body 17. Mounted upon the screw-threaded portion 24 of the electrode rod 22 is a pair of wing nuts 27, 28 under which is secured the leading-in-wire or circuit wire connections, not shown.

Surrounding the outer portion of the cylindrical body 17 and abutting against the outer end of the section 14 is a dome-shaped shield 29 of a diameter greater than the diameter of the off-set 5. The shield 29 is formed of elastic material so that the wall of the opening 30 which is provided in the shield will snugly fit the cylindrical body 17. The shield 29 is so arranged as to enable the connecting up of the leading-in wires when occasion so requires without removing the shield, and furthermore the shield is so arranged that it is not necessary to remove it when it is desired to disconnect the plug from the engine cylinder. The position of the shield is such as to prevent short-circuiting between the engine body and outer end of the plug if the plug should become wet. Furthermore, the arrangement of the shield is such that it leaves the outside terminal free of access and allows the operator to adjust the various portions of the plug without removing the shield.

What I claim is:—

1. A spark plug comprising an inner and an outer section, said inner section terminating at its inner end in a pair of fixed electrodes, a body of insulating material secured within said sections by the outer of said sections, an electrode rod extending through said body and provided with an integral off-set abutting against the body, said rod having its inner end extending between the fixed electrodes, a plurality of nuts carried by the outer end of said rod for fixing it in position

and for connecting a circuit wire therewith, a compression nut mounted upon the said inner section, and a water jacket formed integral with said inner section and independent of the water jacket of the cylinder of the engine.

2. A spark plug comprising an inner and an outer section, said inner section terminating at its inner end in a pair of fixed electrodes, a body of insulating material secured within said sections by the outer of said sections, an electrode rod extending through said body and provided with an integral off-set abutting against the body, said rod having its inner end extending between the fixed electrodes, a plurality of nuts carried by the outer end of said rod for fixing it in position and for connecting a circuit wire therewith, a compression nut mounted upon the said inner section, a water jacket formed integral with said inner section and independent of the water jacket of the cylinder of the engine, and a dome-shaped shield snugly engaging said body, arranged in close proximity to said outer section and extending towards said inner section.

3. A spark plug embodying a pair of terminals insulated from each other, a water jacket, and an elastic shield surrounding the insulation between the terminals, said shield extending in close proximity to the water jacket.

4. A spark plug embodying a pair of terminals, an insulating medium between the terminals, and a shield having an elastic portion contacting with the insulation, said elastic contacting portion adjusting itself to different diameters of insulators and water-tight.

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

WILLIAM B. HAYDEN.

Witnesses:

GEORGE U. WHITE,
RALPH B. CRUMMY.