F. J. HEASEL.

SPARK PLUG.

APPLICATION FILED FEB. 18, 1909.

958,247. **Patented May 17, 1910.**

Fig. 1

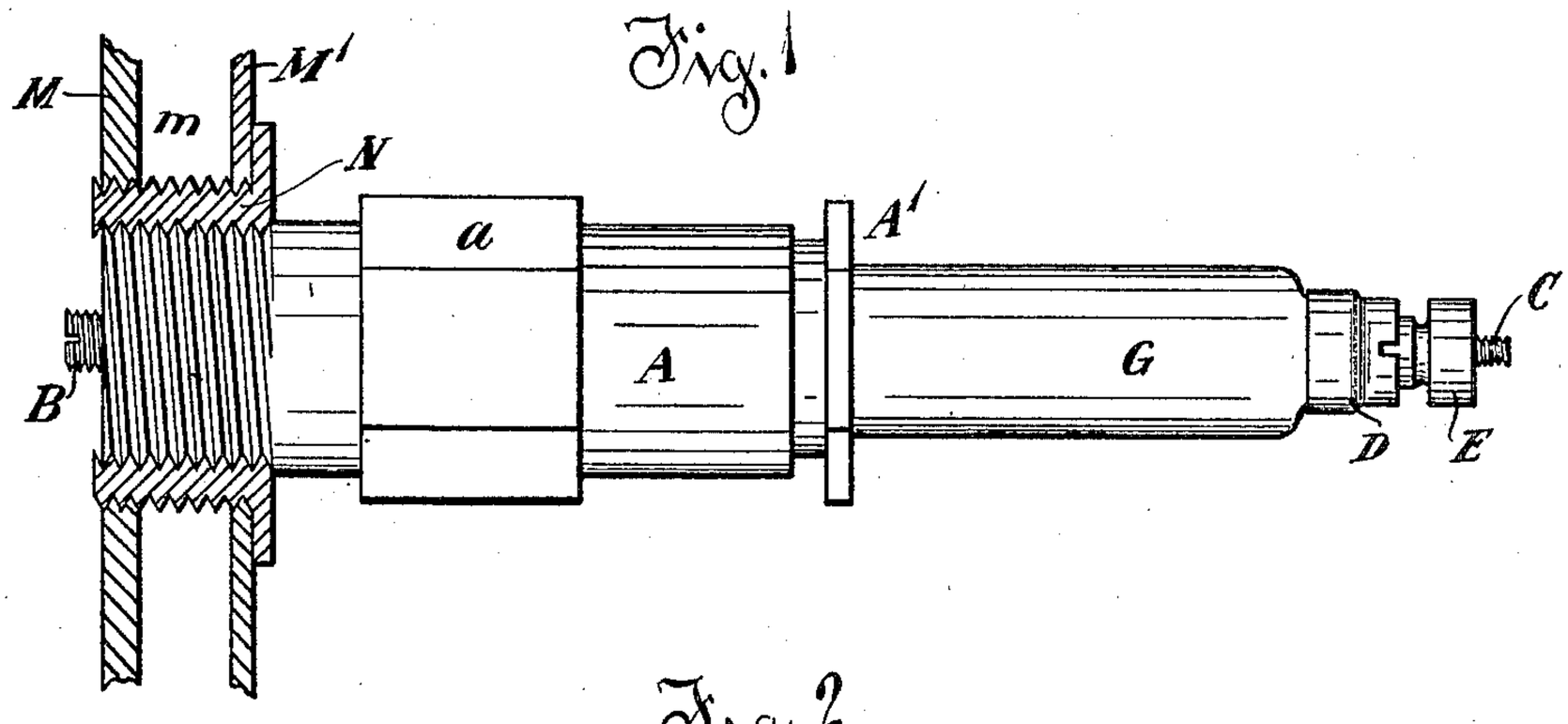


Fig. 2

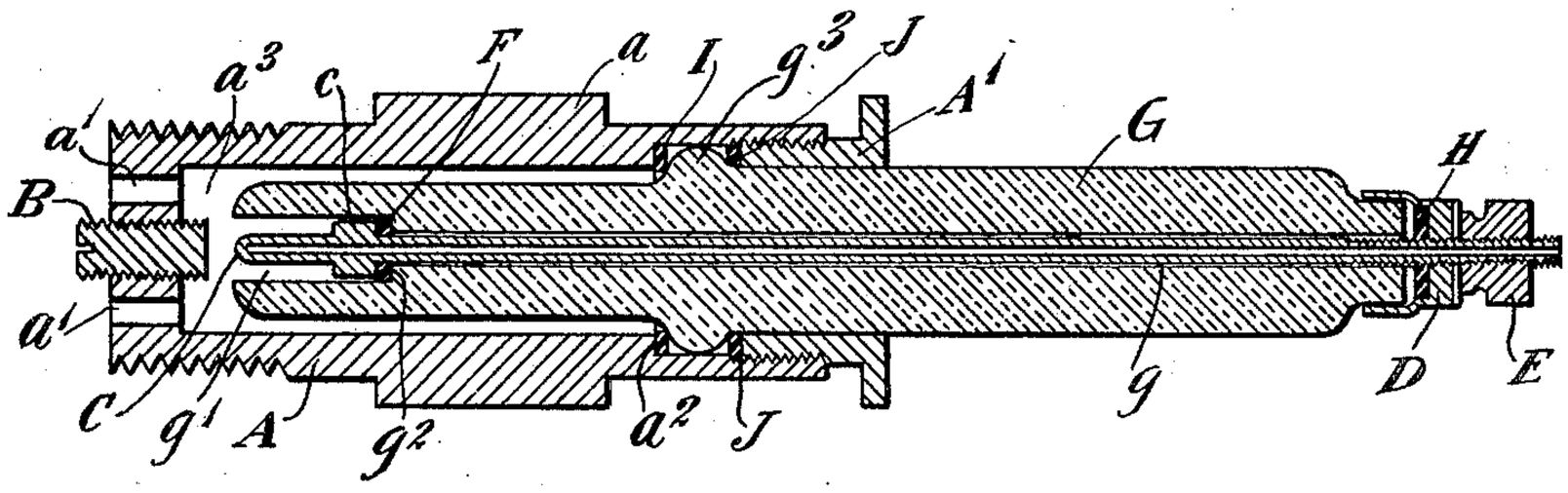
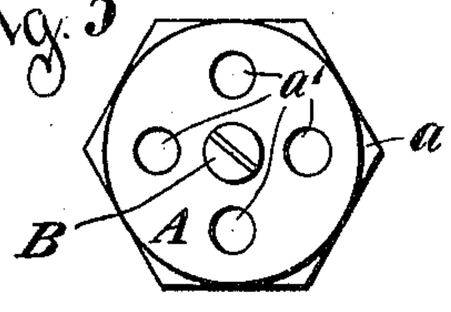


Fig. 3



Witnesses

M. A. Jackson

L. M. Hosea

Inventor

Frederick J. Heasel

By Walter A. Knight

Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK J. HEASEL, OF CINCINNATI, OHIO.

SPARK-PLUG.

958,247. Specification of Letters Patent. Patented May 17, 1910.

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To all whom it may concern:

Be it known that I, FREDERICK J. HEASEL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Spark-Plugs, of which the following is a specification.

My invention relates to devices designed to produce an electric spark to ignite the gas within the cylinder of an explosion-engine. Such devices are commonly known as spark-plugs.

The particular objects of my invention are, 1st, to prevent excessive heating of the sparking points or electrodes; 2nd, to provide for easy regulation of the distance between the points without bending or mutilating any parts, and, 3rd, to insure the regular formation of sparks by maintaining a gap between the spark points.

Other plugs produce the sparks within the cylinder chamber itself, where the high tension point is constantly exposed to extremely high temperatures, becoming red hot and causing premature explosion, while in my device the spark, is produced within a chamber of the device itself, opening into the cylinder chamber. As the cylinder is water jacketed the temperature of the spark plug is constantly decreased by the water in the water jacket of the cylinder; and the high tension electrode is made hollow and open at its outer end to gain the cooling effect of the air therein. The position of the sparking points, and the formation of the plug shell, keeps any excess of cylinder oil from bridging the space between the electrodes; hence constant formation of sparks is possible.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the complete spark plug, with engine cylinder broken away, showing only contiguous parts. Fig. 2 is an axial section of the plug. Fig. 3 is a plan view of the inner end of the plug.

In the drawings a water jacketed explosion engine cylinder with inner shell, M, and outer shell, M^1, with water space, m, between, is drilled and threaded and the bushing N fitted therein.

A, that portion of the spark plug shell whose closed end is threaded to enter the bushing, N, is provided with a portion, a, shaped for wrench contact, and has its open end threaded to form with the cylinder plug, A^1, a stuffing box. The shell A has its closed end, perforated axially, the perforation threaded to receive the adjustable, low tension sparking point, B, and other perforations, a^1, adapted to connect the interior chamber, a^3, of the shell, A, with the interior of the engine cylinder when the plug is in position.

The high tension electrode, C, is a hollow stem, open at its outer end, which is threaded exteriorly to receive the nut, D, and the lock nut, E. A circumferential lug, c, is adapted to fit leak tight against the packing ring, F, seated against a shoulder, g^2, formed by the enlarged bore, g^1, of the axial perforation, g, of the insulator, G. The nut D is also provided with a packing washer, H, and when the nut D, and the lock nut, E, are screwed down tight, the electrode, C, the insulator, G, and their fittings form one detachable part of the spark plug. The circumferential lug, g^3, has a packing ring, I, on its outer side adapted to seat against the shoulder, a^2, of the shell A; and a packing ring, J, on its outer side adapted to contact with the inner end of the cylindrical plug A^1. When the insulator, G, with electrode C, fixed therein, is fitted into place in the shell A and the plug A^1 is screwed into position the whole device is integral and readily screwed into position upon the engine cylinder. These plugs may be screwed into the cylinder in any position that will allow the oil thrown from the engine cylinder into the plug chamber, a^3, to drain off through the perforations, a^1.

It will be understood that the sparking point, B, makes the ground or low tension electrical connection and the point C, is provided with the high tension connection to complete the circuit.

It will be seen that the water when circulated in the water space, m, of the cylinder M—M^1, constantly tends to cool the bushing N, and the contiguous portion of the plug shell, A, including the sparking point, B, and as all portions of the surrounding plug shell are kept from reaching high temperatures there is a constant tendency to keep down the temperature of the sparking point, C.

I claim as new and desire to secure by Letters Patent of the United States:

A sparking device embodying in combination a cylindrical casing open at the outer end and closed at the inner end by a per-

forated wall and exteriorly screw-threaded to seat in the cylinder shell with its inner end substantially flush with the interior surface of the cylinder; a low tension sparking electrode adjustably seated axially in and projecting through said end wall; an insulating plug axially perforated, countersunk and of reduced external diameter at its inner end, and projecting outwardly through the casing and secured thereto; a high tension electrode carried axially through said insulating plug, said electrode being closed at its inner end but otherwise hollow throughout and open to the external atmosphere.

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

FREDERICK J. HEASEL.

Witnesses:

WALTER A. KNIGHT,

M. A. JACKSON.