July 3, 1928.

1,675,764

G. MICKEL

SPARKING PLUG

Filed July 18, 1927

Fig. 1.

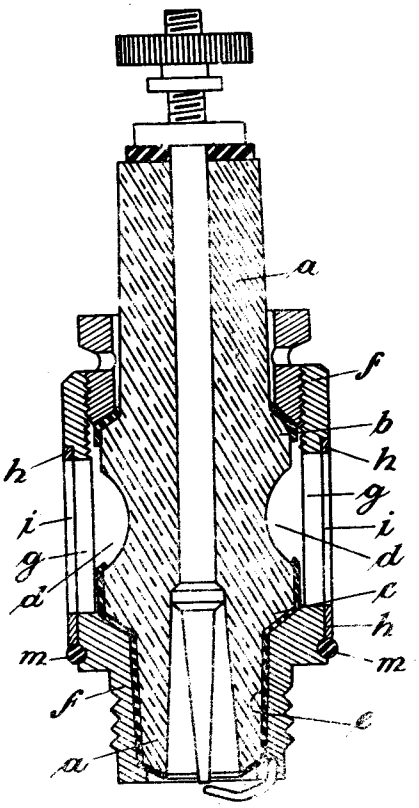
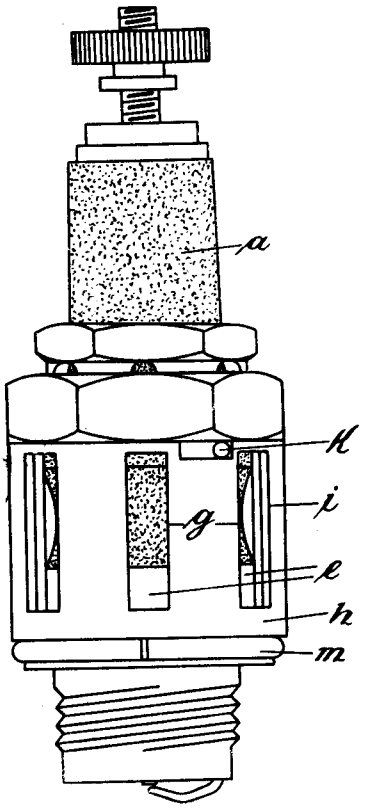


Fig. 2.



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UNITED STATES PATENT OFFICE.

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SPARKING PLUG.

Application filed July 18, 1927, Serial No. 206,763, and in Germany October 19, 1926.

This invention relates to sparking plugs for internal combustion engines of any kind.

It has become known to provide in sparking plugs ventilating holes to prevent excessive heating. These air or ventilating holes are not sufficient for cooling, owing to the high temperatures of the actually used engines. Excessive heating occurs consequently which causes defects of the insulator and of the electrodes so that the sparking plug becomes unfit for use.

These inconveniences are obviated by the present invention.

According to the invention the insulator has in its middle thickened portion a circular groove by which an air chamber is formed which extends around the insulator. This air-chamber communicates with the atmosphere through openings in the sparking plug body, suitable devices being arranged to regulate said openings so that they might be closed partly or completely.

Another characteristic feature of the invention is that the metal sleeve which encloses the lower portion of the insulator extends from the point of the insulator into said air-chamber.

An embodiment of the invention is illustrated, by way of example, in the accompanying drawing, in which:—

Fig. 1 is a longitudinal section.

Fig. 2 shows in elevation the complete sparking plug with fully opened regulating envelope.

The middle portion of the insulator *a*, which is of greater diameter than the other parts of the same, has a circular groove *d* of curved cross section. Owing to this groove the insulator is separated into an upper conical portion *b* and a lower conical portion *c*. The groove forms an air chamber *d* which extends around the insulator. The lower portion of the insulator is covered by a tightly fitting metal sleeve *e* of copper, aluminum or the like. This metal sleeve *e* extends from the point of the insulator up to the air-chamber *d*. This metal sleeve *e* is situated between the insulator *a* and the sparking plug casing and it ensures a reliable packing of the insulator, and as the packing surfaces are rather large neither air, oil or soot can penetrate through them between the sparking plug casing and the insulator, the prejudicial flame contact with the insulator being absolutely prevented.

The metal sleeve *e* presents further the advantage that it deflects the heat from the lowermost portion of the insulator towards the air chamber *d* so that any accumulation of heat in the lower portion of the insulator is avoided. The metal sleeve forms, for instance, a heat transmitter and prevents self-ignition owing to the point of the insulator getting red hot and insulator defects. Openings *g* in the sparking plug casing *f* serve further for cooling the insulator. This air cooling is adjustable owing to an envelope *h* mounted on the sparking plug-casing so that it can be turned around the same. This regulating envelope *h* has apertures *i*, slits or holes, which correspond with the openings *g* in the sparking plug casing. The regulating envelope *h* can be turned around the insulator casing without removing the sparking plug from the engine. The turning movement of the regulating envelope *h* is limited by a stop pin *k*. Owing to the regulating envelope and to the openings in the same and in the sparking plug casing, the cooling effect can be regulated in accordance with the conditions of temperature in the engine. To avoid accidental displacing of the regulating envelope *h* it is securely held by a split resilient ring *m*.

I claim:—

Spark plug with air cooling for internal combustion engines, comprising in combination an insulator having a circular groove in its middle portion of greater diameter than the remainder and forming an air chamber around the insulator, a sparking plug body in which said insulator is located and having openings in the form of slots, a metal sleeve tightly fitting over the lowermost portion of the insulator and extending up to said air chamber, and a metal sleeve mounted on said sparking plug casing so that it can turn around the same said regulating envelope having openings corresponding with said openings in the sparking plug casing which can be closed partly or entirely.

In testimony whereof I affix my signature.

GEORG MICKEL.