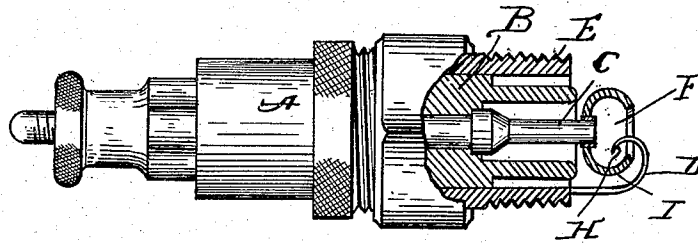


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IGNITER FOR INTERNAL COMBUSTION MOTORS.
APPLICATION FILED SEPT. 27, 1907.

942,328.

Patented Dec. 7, 1909.



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HOWARD A. JOHNSTON, OF TORONTO, ONTARIO, CANADA.

IGNITER FOR INTERNAL-COMBUSTION MOTORS.

942,328.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 27, 1907. Serial No. 394,869.

To all whom it may concern:

Be it known that I, HOWARD ADDISON JOHNSTON, of the city of Toronto, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Igniters for Internal-Combustion Motors, of which the following is a specification.

My object is to devise an electric igniter which is capable of igniting a spray of heavy oil. An ordinary spark will not do this unless the oil is first vaporized, nor will an electrically heated wire, as, while the latter will vaporize the oil which strikes it, it fails to ignite the vapor. In designing a workable spark plug for heavy oils I have therefore found it necessary to arrange it so that a small portion of the oil is vaporized by electrically generated heat and the vapor ignited by an electric spark. I have accomplished this result by so constructing the electrodes of the plug that a portion of the spray of oil contacts with electrode surfaces so located and constructed that the oil caught thereon is collected at the spark gap and vaporized by the heat of a spark in passing from electrode to electrode, by heat due to electrical resistance or by both, and the vapor ignited by the spark.

The drawing shows a side elevation, partly in section, of my igniter.

A is a sparking plug, which is preferably of the "soot proof" type. In this type of plug a porcelain petticoat B surrounds the central electrode C. The other electrode D is connected with the metal part E of the plug.

The object of my igniter being to vaporize a small quantity of oil for subsequent ignition by the spark, I make the end of one of the electrodes of comparatively fine wire, and so arrange them that there is presented at the spark gap a surface, or surfaces, adapted to collect between them a certain amount of any fluid which may be sprayed against the igniter, and this fluid is vaporized at the time of passing of the spark, partly by the heat of the spark and partly also in all probability by the heat due to the electrical resistance of the comparatively fine electrode. It should be noted here that the drawing is shown on a large scale to better illustrate the parts.

I have found that better results are obtained by providing special means for directing against the electrodes a part of any fluid sprayed in the direction of the igniter.

It is also preferable that the directing means should also effect a concentration of the spray. For this purpose I provide a receiver F, which forms part of one of the electrodes and insures the accumulation of a sufficient quantity of fluid adjacent to the spark gap to furnish sufficient vapor for ignition purposes. To retain the liquid adjacent the spark gap, the receiver is so shaped as to form a cup I below the spark gap and is preferably closed at its inner end so that any sprayed liquid striking within the receiver flows down into the bottom of the cup I.

The outer electrode D is bent around and turned parallel to the cup for a short distance adjacent to the spark gap and is formed of a fine wire. Owing to the cup there is necessarily a comparatively large accumulation of fluid at the spark gap, and when a spark passes so much oil is vaporized that a comparatively large flame is formed which is exceedingly efficient in igniting a spray of liquid fuel. If so much oil accumulates in the cup and at the spark gap that the spark cannot break through a discharge will take place over the surface of the fluid to the nearest part of the cup to the point of the electrode D.

An igniter such as described forms an excellent starting igniter for engines using crude oil as fuel as it will ignite the spray with certainty and does not become clogged. It will also be seen that as the wire electrode extends above the rim of the cup within sparking distance of the rim, in no case can the spark gap be completely insulated with oil as the maximum possible oil level is below the highest possible position of the spark gap.

What I claim as my invention is:

1. An igniter for internal combustion motors comprising a sparking plug provided with suitable electrodes, one electrode being shaped to form a cup, and the other shaped as a wire extending from without the cup within sparking distance of the rim of the cup.

2. An igniter for internal combustion motors comprising a sparking plug provided with suitable electrodes, one electrode being shaped to form a cup, and the other shaped as a wire entering the cup from without and extending within sparking distance of the cup at any point of their overlap.

3. An igniter for internal combustion

motors comprising a sparking plug provided with electrodes suitably shaped to form between them a spark gap and a cup below the spark gap shaped to give a maximum possible fluid level slightly below the spark gap whereby a supply of liquid fuel may be held at the spark gap which cannot rise above and insulate the spark gap.

4. An igniter for internal combustion motors, comprising a sparking plug provided with a suitable electrode; and a cup formed as part of another electrode forming a spark gap with the first electrode, adapted to concentrate a spray of fuel upon the

spark gap, and cupped below the spark gap, the first electrode being formed of comparatively fine wire. 15

5. An igniter for internal combustion motors, comprising a sparking plug provided with a suitable electrode; and a cup formed as part of another electrode and located at the spark gap, one of the electrodes being formed of comparatively fine wire. 20

Toronto, Ont., 16th September, 1907.

HOWARD A. JOHNSTON.

Signed in presence of—

J. EDW. MAYBEE,

F. W. MCKENDRICK.