

W., E. & G. HAGSTROM.
SPARK PLUG.
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Patented June 6, 1911.

994,673.

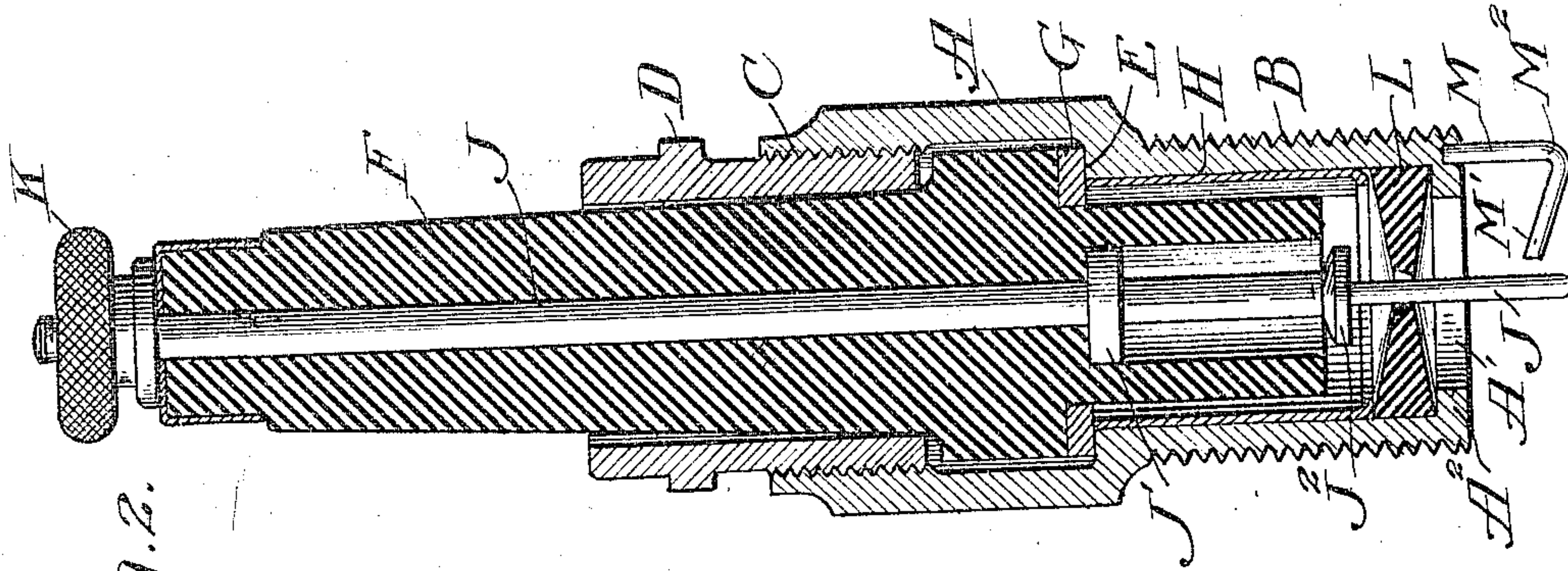


Fig. 2.

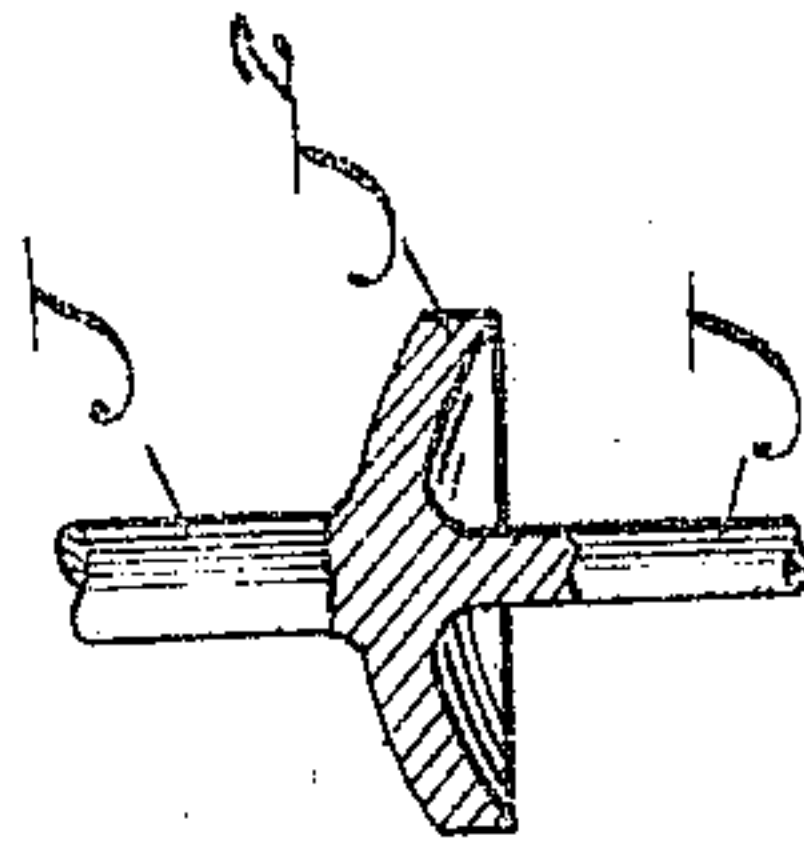


Fig. 3.

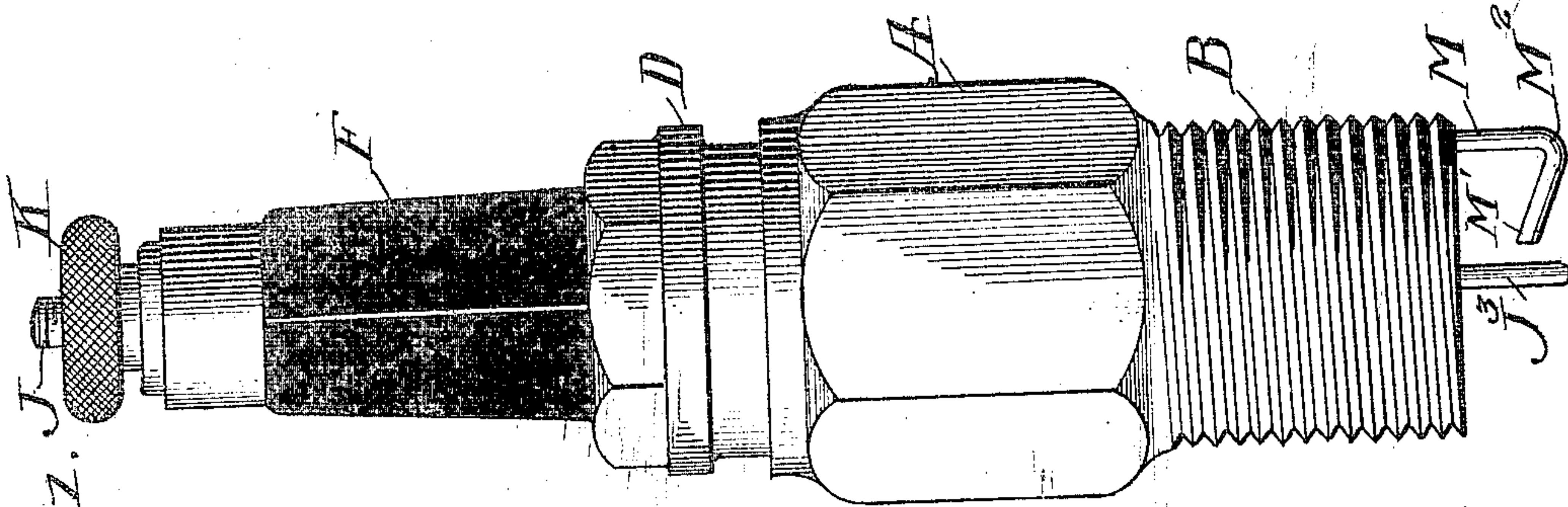


Fig. 1.

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UNITED STATES PATENT OFFICE.

WILLIAM HAGSTROM, EMANUEL HAGSTROM, AND GUSTAF HAGSTROM, OF LINDSBORG, KANSAS, ASSIGNORS TO HAGSTROM BROTHERS MANUFACTURING COMPANY, OF LINDSBORG, KANSAS, A CORPORATION OF KANSAS.

SPARK-PLUG.

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To all whom it may concern:

Be it known that we, WILLIAM HAGSTROM, EMANUEL HAGSTROM, and GUSTAF HAGSTROM, inventors, citizens of the United States of America, and residents of Lindsborg, McPherson county, State of Kansas, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

Our invention relates to spark plugs and has for its object improvements in such devices, particularly with respect to construction and arrangement of parts that will prevent short-circuiting in such devices. Such short-circuiting occurs in a good many instances by reason of oil or carbon being deposited upon the spark points or upon some of the parts that should be insulated from each other, and such short-circuiting is, of course, a disadvantage to be overcome.

In the accompanying drawings—Figure 1 is an elevation of a plug at an enlarged size showing the exterior thereof; Fig. 2 is a longitudinal section corresponding with Fig. 1, but having the main or central stem in elevation, and Fig. 3 is a detail partly in elevation and partly in section at a still more enlarged scale for the purpose of showing a collar upon the central stem of the device which collar may be either integral with the stem, as shown, or may be a separate piece upon the stem.

In the said drawing, A is a casing having the lower portion provided with exterior screw-threads B and the upper portion with internal screw-threads C. A nut D is adapted to screw into the threads C. Within the casing A and resting on a shoulder E is an insulating body F. This insulating body may be of any insulating material, but is preferably of porcelain, which is less destructible except for breaking than other bodies used for the purpose. A washer G is interposed between the bottom of the insulating body F and the shoulder E which washer rests upon the top of a thimble or sleeve H. The insulating body F has an auxiliary opening therethrough, in which auxiliary opening is a pin or stem J provided with a collar J¹ in a chamber in the lower part of the insulating body F and a nut K on the upper threaded end of the said stem. Below the collar J¹ is another collar J²

which is preferably cup-shaped with its cup facing upward, as shown in Fig. 3.

The bottom of the casing A has an enlarged opening A¹, which opening is not quite so large as the internal opening, with the result that it provides a lip A², on which lip is a washer L. This washer is preferably of the shape shown in Fig. 2, which shape is such that it is thinner at its inner portion than at its periphery. A small opening through the center of the washer L permits the lower end of the stem J to terminate in a small projection J³, which projection extends outside of the casing A and forms one of the sparking points of the plug. The washer L lies loosely within the casing A, and is held down by reason of the thimble or sleeve H resting upon it, which thimble, as before described, is held down by the collar G. The washer L is preferably made of porcelain and is an insulator between the casing A and the end J³ of the central stem J. In devices as heretofore made, the metal represented by the shoulder A² usually comes close to the sparking point or projection J³, with the result that if carbon or oil should be deposited upon the side of the projection J³, and the lip A² enough might be deposited there to short-circuit the device. The bevel on the lower part of the washer L is so arranged that if oil should be splashed upon the bottom of the washer L it will run down by gravity away from the central stem J³. The other sparking point consists of a stem M fastened into the casing A and having an arm M¹ projecting toward the sparking projection J³. The angle between M and M¹ is an acute angle thus leaving a corner M² which is lower than any other part of the inserted point M. The extreme end M¹ of this spark point does not come adjacent to the extreme end of the spark point J³, but comes only to the side of it at some little distance removed from the extreme end of said point. The result of this construction is that if oil should be splashed upon the parts M and J³ at the place where they are nearest together, the oil would run by gravity into and drop at the extreme end of J³ away from the point M¹, or would run down the point M¹ to the corner M² away from the sparking point J³. It will be seen

by this that the arrangement of these points is such that it is not easy for oil or carbon particles to be deposited so as to short-circuit the sparking points. The collar J² is placed a small distance above the opening in the washer L so that if oil or carbon should work upward through the opening in the washer L it will not be deposited upon the extreme lower end of the central body F, and by being thus deposited form a short-circuit projecting across from the central stem to the outside casing. This collar J² is, as a consequence, an additional means of preventing short-circuiting.

15. The sectional view in Fig. 2 will show the manner of putting the device together, which may preferably be stated as follows: The washer L is placed within the casing A and the bushing or thimble H placed thereon. 20 The washer or ring G is then placed upon the shoulder E so as to hold the thimble H down. The central stem is then placed within the central body F and secured in place by means of the nut K. The body F 25 is then placed within the other case and the nut D screwed down to secure the different parts firmly in position. The device in use usually stands upright in the position shown in the drawings.

30 What we claim is:

1. In a spark plug, the combination with a casing having an annular inwardly-extending flange at its lower end, and an insulating body carried by the casing, of a central stem 35 supported by the insulating body and having one end projecting through and beyond

the lower end of the casing to form a sparking point, said central stem having thereon within the casing and adjacent the lower end of the insulating body an inverted cup-shaped guard serving to prevent conducting bodies from being conveyed on said stem beyond such guard, and a porcelain washer surrounding the stem and supported by the annular flange at the lower end of said casing, said washer having concave lower and upper faces. 45

2. In a spark plug, the combination with a casing having a washer support at the lower end, and an insulating body carried by the casing, of a central stem supported by the insulating body and having one end projecting through and beyond the lower end of the casing to form a sparking point, said central stem having thereon within the casing an inverted cup-shaped guard serving to prevent conducting bodies from being conveyed on said stem beyond such guard, and a porcelain washer mounted on said surrounding washer support of the casing and surrounding the stem, said washer having concave upper and lower faces, as and for the purpose described. 55 60

Signed at Lindsborg, Kans. this 17th day of Nov. 1909.

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Witnesses:

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J. A. MORINE.