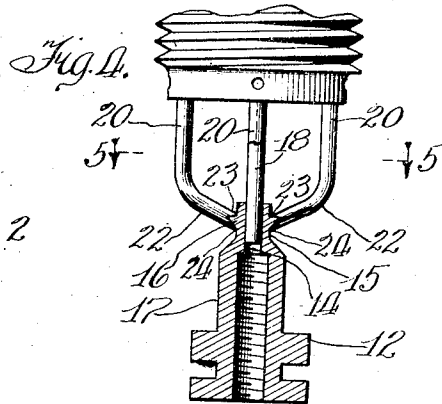
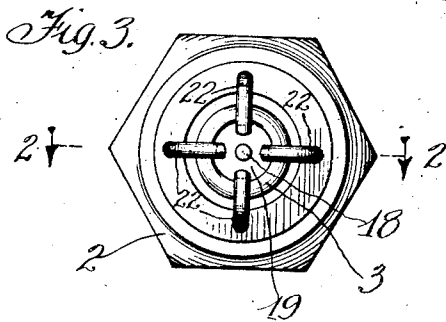
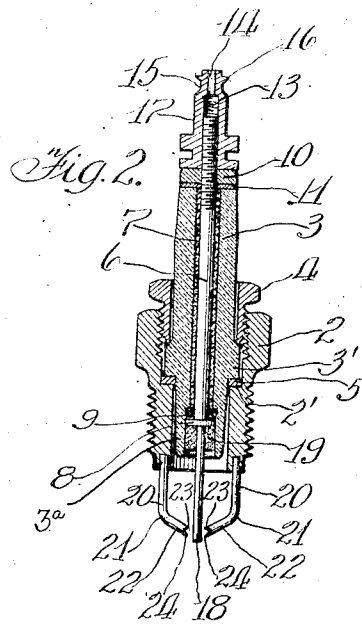
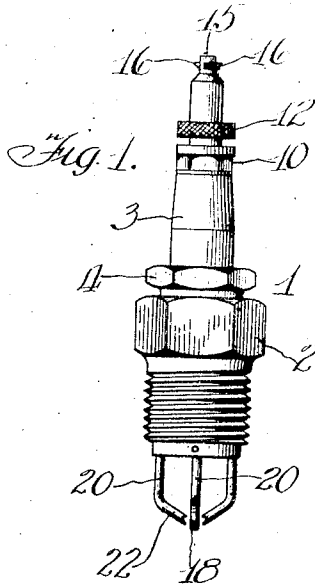


C. C. ELDRIDGE & E. J. BEEBE.
SPARK PLUG.
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1,028,200.

Patented June 4, 1912.

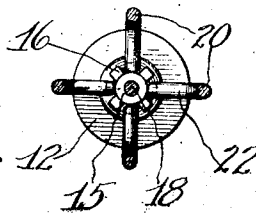


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Fig. 5.



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CHARLES C. ELDRIDGE AND EDWIN J. BEEBE, OF MARSHALLTOWN, IOWA.

SPARK-PLUG.

1,028,200.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed March 20, 1911. Serial No. 615,689.

To all whom it may concern:

Be it known that we, CHARLES C. ELDRIDGE and EDWIN J. BEEBE, citizens of the United States, residing at Marshalltown, in the county of Marshall and State of Iowa, have invented certain new and useful Improvements in Spark-Plugs, of which the following is a specification.

Our invention relates to improvements in spark plugs of the general type disclosed in a former application No. 606,477, filed February 4, 1911, by Charles F. Johnston, and has for its principal objects to provide an improved construction of the electrode tips for producing a more powerful spark, and also to provide ready means adapted to facilitate adjusting and cleaning such electrodes. These and further objects will be made apparent in the following description and claims taken in connection with the accompanying drawings in which like reference numerals refer to like parts.

Figure 1 is a front elevation of the spark plug assembled complete. Fig. 2 is a vertical axial section of the plug along the line 2—2 of Fig. 3. Fig. 3 is an enlarged upward plan view. Fig. 4 is an enlarged front elevation of the lower end of the spark plug with the gage and cleaner element engaging the electrodes, said element being shown in axial section. Fig. 5 is a transverse plan view taken on the line 5—5 of Fig. 4 facing with the arrows.

The main body 1 of our improved spark plug comprises chiefly a bushing-like casing 2 adapted to be screwed into an engine cylinder, an insulator 3 contained therein, and a nut 4 locking said insulator in position within said casing. The insulator 3 is provided with an annular flange 3', one side of which bears against a suitable packing ring 5 resting on the shoulder 2' of the casing 2. The other side of this flange 3' is engaged by the inner end of said nut 4. The insulator 3 is hollow and contains an electrode rod 6 which is surrounded by a layer of insulating material 7, as cement or the like. The lower end of this rod 6 is provided with a transverse shoulder 8 which occupies an enlarged portion of the cylindrical opening at the lower end of said insulator. In other words, the lower end of the insulator 3 is in the form of a petticoat 3^a which incloses the shoulder 8. Suitable packing material 9 is placed above this shoulder 8 between it and the annular shoulder formed by the re-

stricted opening in the insulator which extends upwardly from the petticoat 3^a. Surrounding the rod 6 within the lower portion of the petticoat 3^a is an additional quantity of cement 10 or the like which assists by its cushioning action to prevent breakage of the insulator 3 by the expansion of the electrode 6. The upper end of the rod 6 is threaded and provided with a nut 10 beneath which and the upper end of the insulator 3 is a suitable washer 11.

The extreme outer end of the rod is provided with a cap 12 to facilitate the attachment of an electric wire, said cap having a relatively large threaded axial hole 13 in its lower portion to receive the end of the rod 6 and a small cylindrical perforation 14 extending axially through its upper tip end. The upper end 15 of this cap is formed externally in the shape of a small cylinder coaxial with the main body of the cap. This small cylindrical portion is provided with an annular series of radially extending points 16. Below the portion 15 is the body part 17. The opposite or lower end of the plug is provided with a plurality of electrode elements or branches 20 which extend outward parallel with the central electrode 18 for a short distance and then turn inward at points 21, the inwardly turned portions 22 being preferably inclined diagonally toward the central electrode 18. The inner ends of these branches preferably all lie in a common plane extending transversely of the central electrode. They are provided on their inwardly turned end faces with notches extending in the present embodiment transversely of the axis of the plug and are provided on the edges of said notches with corresponding inwardly turned points lying adjacent to but slightly out of contact with the central electrode. These points permit the sparks to jump more easily between the electrodes.

If the electrode branches 20 should become bent so as to be unequally distant from the central electrode, the cap 12 may be unscrewed from the rod or binding post 6, the end 15 of said cap inserted over the central electrode 18, and tips 22 pressed into contact with the portion 15 of the cap. It will thus be seen that the cap 12 may be used as a gage when the electrodes require adjustment. Should the electrodes become corroded or coated with carbon, the cap 12 may be placed upon the central electrode 18 as

above described, with the points 16 lying between the tips 22. The cap may then be turned, the points 16 passing through and engaging successively the several notches 5 aforesaid, thus cleaning and polishing them.

Having thus described our invention, we claim:

1. In a spark plug, in combination, a main body portion and electrodes on one end thereof, one of which is positioned centrally and the other of which comprises a plurality of branches electrically connected at their base and positioned beside the said central electrode but spaced apart therefrom, the free ends of said branches being turned toward said central electrode and each of said branches being provided with a plurality of points so as to produce a large spark, said points extending closely adjacent 20 to said central electrode, but separated therefrom by a suitable spark space.

2. In a spark plug, in combination, a main body portion, a central electrode extending outward from one end thereof, and 25 a second electrode having a plurality of branches extending outward from said body at the sides of said central electrode, the free ends of said branches being turned toward the said central electrode and each being 30 provided with a transverse notch and a pair of corresponding points on the opposite sides of said notch, and means detachable from the opposite end of said body adapted to fit rotatably on the said central electrode 35 as an axis to facilitate adjusting and cleaning said electrodes.

3. In a spark plug, the combination with a body having a central axial electrode on one end, of a second electrode having 40 branches, the free ends of which are turned toward the said central electrode and each of said branches being provided with transverse notches and points on opposite sides of said notches, and a detachable cap on the 45 other end of said body, the outer end of which is longitudinally perforated along its axis enabling it to fit over the said central electrode and also provided with an annular row of radially extending points adapted to 50 successively brush past the several notches aforesaid when the said cap is rotated on the said central electrode as an axis to clean the said electrodes.

4. A spark plug of the character described, comprising a plurality of electrodes 55 one of which is notched, and an element adapted to be detached from the plug and having a perforation adapted to be fitted rotatably upon one of the electrodes of the plug, said element also having a projection 60 adapted to brush past the notched electrode, said projection passing through the notch to clean the latter when said element is rotated upon the first mentioned electrode.

5. In a spark plug of the character described, a main body portion and electrodes 65 on one end thereof, one of said electrodes being notched, and a detachable cap having a longitudinal axial perforation adapted to receive one electrode, a cylindrical portion 70 of said cap coaxial with said perforation adapted, when pivoted on said electrode, to serve as a gage in adjusting the distance of the notched electrode, and a radial member on said cylindrical portion extending at an 75 angle to said perforation and adapted to brush past the notched electrode and enter the notch to clean it when the said cap is rotated on the first electrode.

6. In a spark plug of the character described, the combination of a casing, an insulating sleeve therein, a central electrode in the form of a rod lying within said sleeve, an enlargement on said rod adjacent one end of said sleeve, packing material surrounding said rod between said enlargement 85 and the adjacent portion of said sleeve, means at the opposite end of said rod for drawing said enlargement against said packing and holding the electrode in the sleeve, 90 a petticoat upon one end of said sleeve surrounding said packing and said enlargement, a quantity of cement surrounding said electrode within said sleeve at the side of said enlargement opposite said packing, and 95 a coating of cement surrounding said electrode, and extending from said packing to the opposite end of said sleeve.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES C. ELDRIDGE.
EDWIN J. BEEBE.

Witnesses:

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