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SPARK PLUG

Filed July 21, 1920

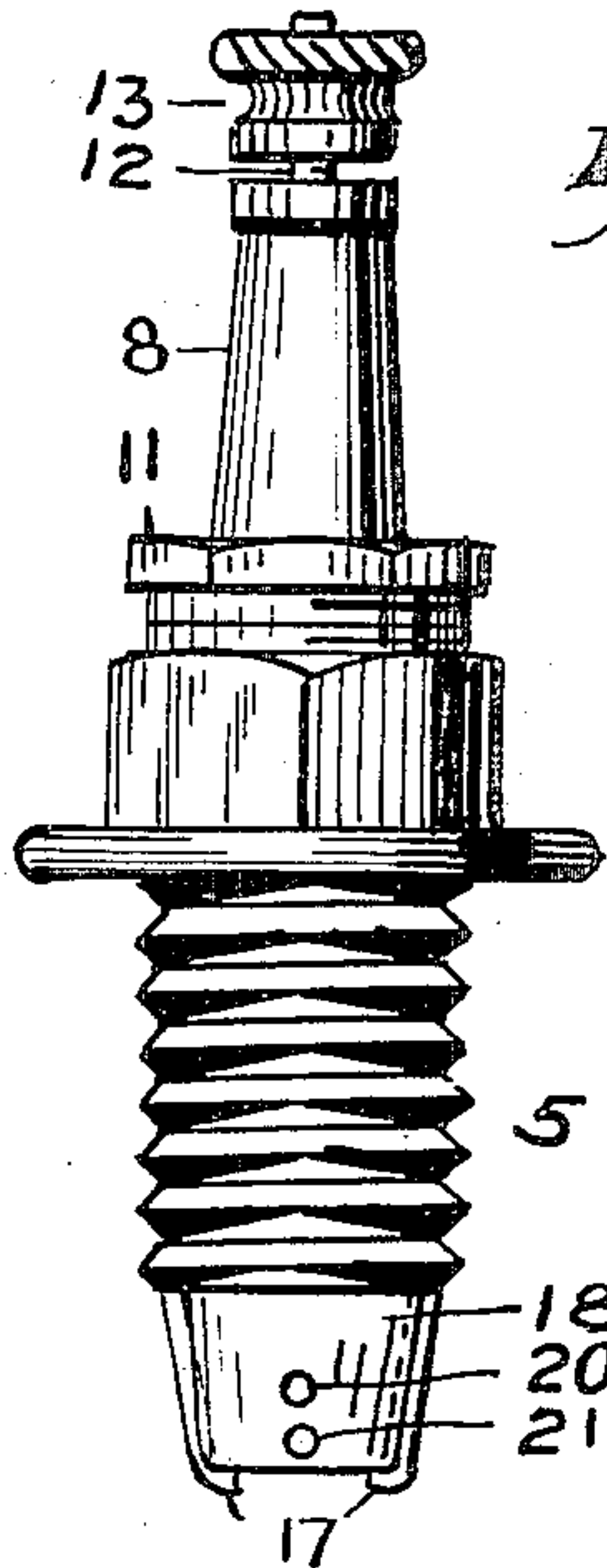


Fig. 1

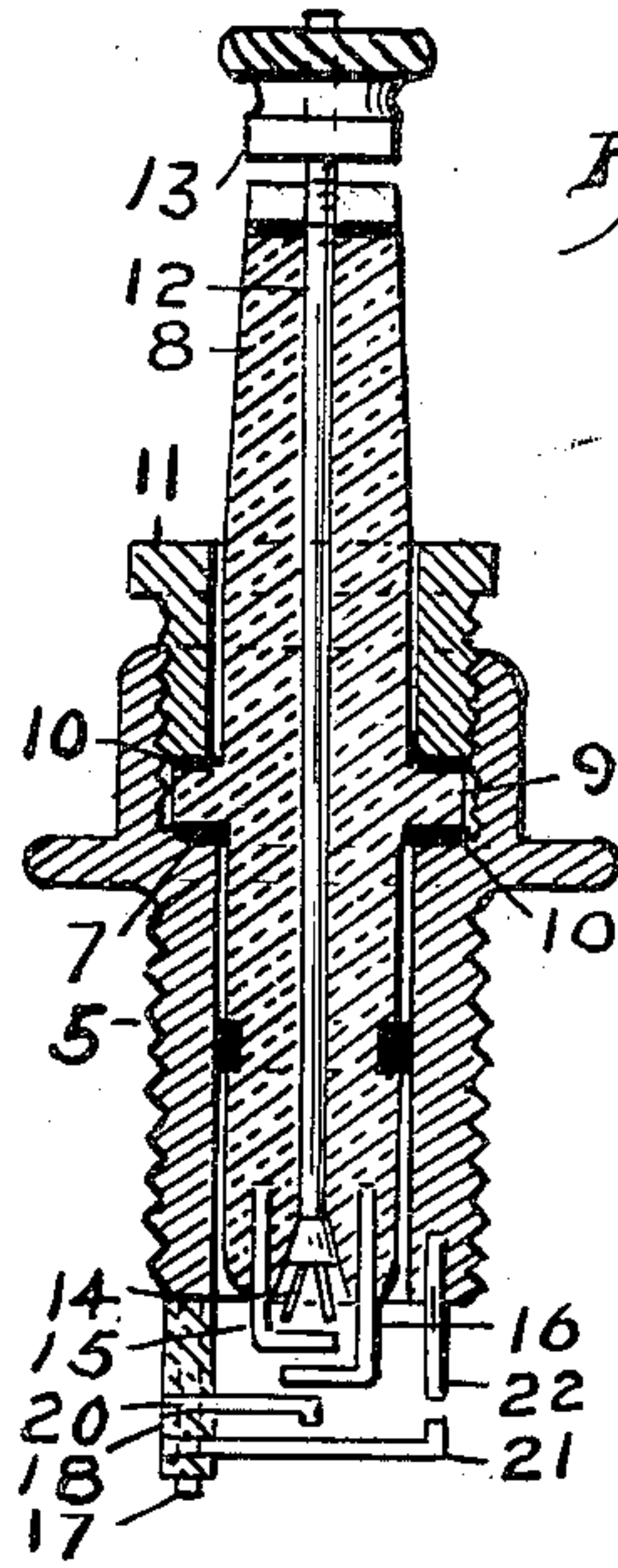


Fig. 2

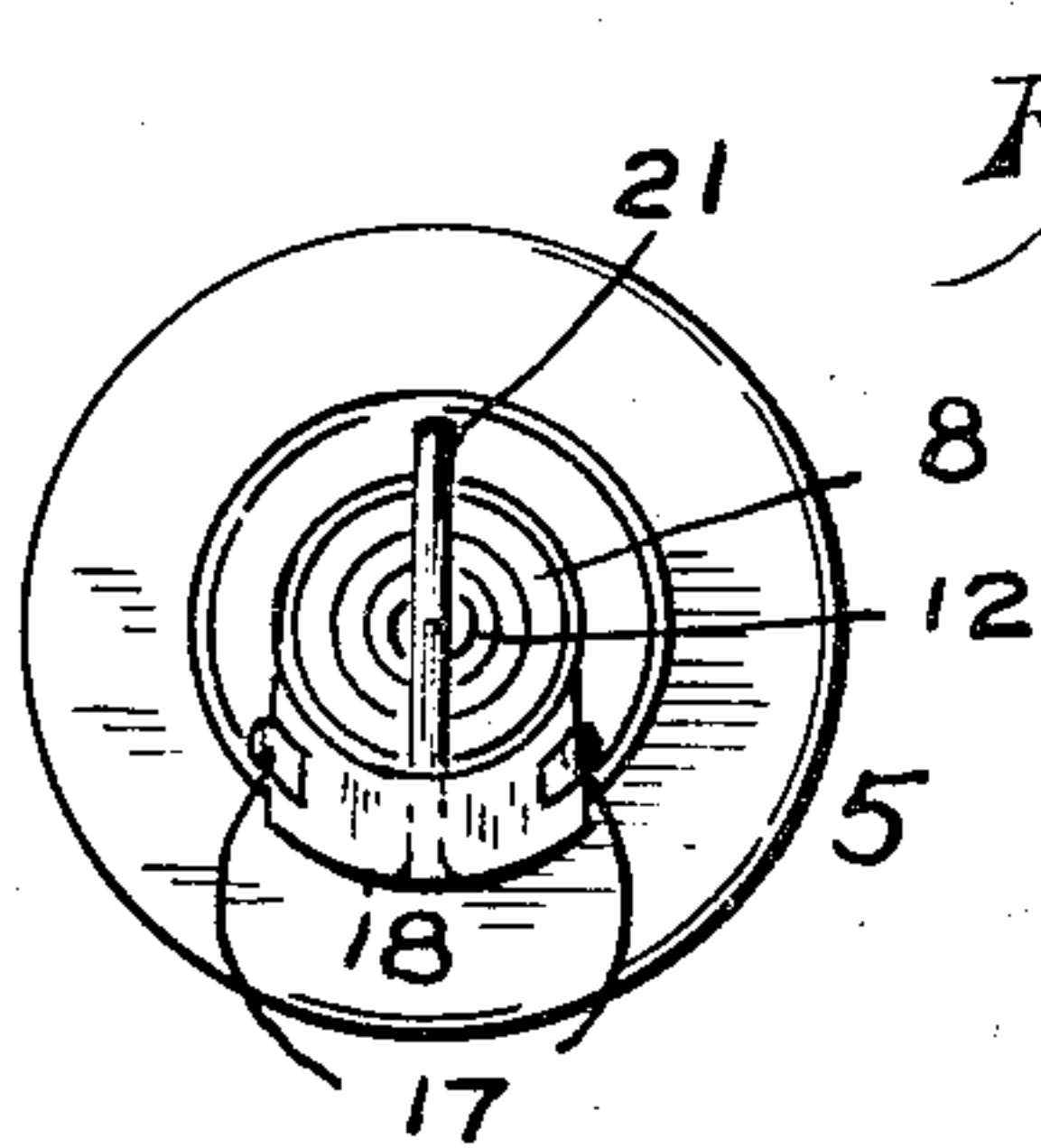


Fig. 3

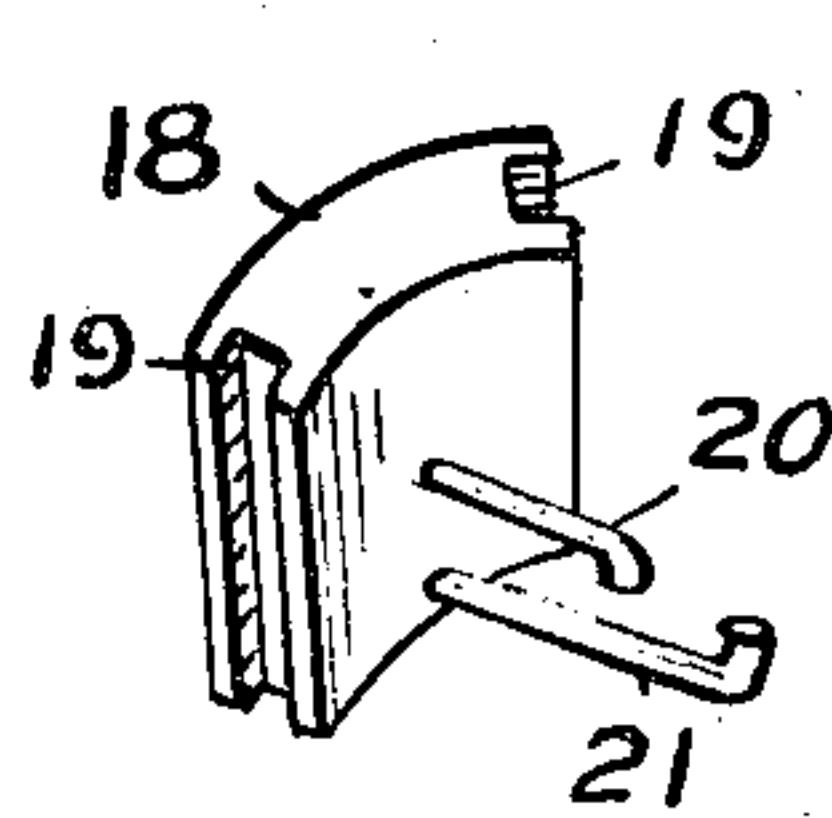


Fig. 4

WITNESS:  
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## UNITED STATES PATENT OFFICE.

JOSEPH G. GAVLAK, OF MONONGAHELA, PENNSYLVANIA.

## SPARK PLUG.

Application filed July 21, 1920. Serial No. 397,844.

*To all whom it may concern:*

Be it known that I, JOSEPH G. GAVLAK, a citizen of the United States, residing at Monongahela city, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Spark Plugs, of which the following is a specification.

This invention relates to spark plugs for internal combustion engines, and has for its object to provide a plug of such class, in a manner as hereinafter referred to, with means at the sparking end of the plug to increase the number of sparks to insure the ignition of the combustible or explosive charge in the explosive cylinder of the engine under such conditions reducing missing of explosions to a minimum.

Further objects of the invention are to provide a spark plug for the purpose set forth which is simple in its construction and arrangement, strong, durable, efficient in its use, readily set up, and comparatively inexpensive.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter set forth and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1, is an elevation of a spark plug in accordance with this invention.

Figure 2, is a vertical sectional view thereof.

Figure 3 is an inverted plan.

Figure 4, is a detail, in perspective, of the removable electrode support.

Referring to the drawings in detail 5 denotes a tubular body or shell, constructed of metal, and adapted to be threaded into an opening or aperture formed in the cylinder, or the head of the latter, of an explosive or internal combustion engine. The outer portion of the shell 5, is offset thereby providing a shoulder 7, intermediate the ends of and on the inner face of the shell.

Extending through the shell, is a porcelain plug 8, having a peripheral flange 9, against each face thereof, is positioned a

gasket or washer 10, and the lower gasket 10 is seated against the shoulder 7.

The inner face of the outer portion 6, of the shell 5, is interiorly threaded and engaging therewith is a peripherally threaded gland 11, which abuts against the upper gasket 10, whereby the plug 8, is secured within the shell 5.

An electrical conductor extends through the plug 8, and which is indicated at 12. The outer end of the conductor 12 is provided with a binding nut 13, for a leading-in-wire not shown, and the inner end thereof is split to provide a pair of electrodes 14. Anchored in the inner end of the plug 8, and projecting inwardly therefrom is a pair of angle-shaped members formed of any suitable material to provide a pair of electrodes 15, 16, one of greater length than the other, and the inner end of the electrode 15 is arranged parallel to the inner end of the electrode, but is disposed in an opposite direction relative thereto. The inner end of the electrode 15 opposes the electrodes 14 and is spaced therefrom. The inner ends of the electrodes 15, 16 are spaced from each other.

Projecting from the inner end of the shell 5, as well as being secured thereto, is a pair of spaced retaining arms 17, formed of bendable material. Connected to the inner end of the shell 5, by the arms 17, is an electrode support 18, formed of porcelain and which is segmental in contour, and has each side edge thereof grooved as at 19. The grooves 19 are provided for the seating of the arms 17, with the inner ends of these latter bent to engage the inner edge of the support 18, whereby the latter is detachably connected to and abuts against the inner end of the shell 5.

Projecting laterally from the inner face of the support 18, as well as being anchored therein, is a pair of electrodes 20, 21, arranged in parallelism and having their free ends oppositely disposed relatively to each other, and with the electrode 21 of greater length than the electrode 20. Associated with the electrode 21 is an electrode 22 which depends from the inner end of the shell 5. The electrodes 20, 21 are spaced from each other and the electrode 21 is spaced from the electrode 22.

The spacing of the electrodes from each other provide for the formation of jump



sparks, one between the electrodes 14 and 15, between electrodes 15 and 16, between electrodes 16 and 20, between electrodes 20 and 21, and between electrodes 21 and 22.

- 5 By the foregoing arrangement provision is made for successive sparking which insures ignition of the explosive charge.

What I claim is:—

- 10 1. A spark plug comprising a shell of conducting material, a non-conducting element secured in the shell, a non-conducting support at the inner end of the shell at one side thereof, means depending from the shell for detachably connecting said support
- 15 to the shell, and electrodes carried by the support, element and shell and associated with each other.

- 20 2. A spark plug comprising a shell of conducting material, a non-conducting element extending therethrough and connected therewith, a grooved support arranged at the inner end of the shell at one side thereof and formed of non-conducting material,

means carried by the shell and extending through the grooves of the support for detachably connecting the support to the shell, and electrodes carried by the support, shell and element and associated with each other. 25

3. A spark plug comprising a shell of conducting material, a grooved segment shaped support arranged against one side of the inner end of the shell and formed of non-conducting material, means depending from the shell and extending through the grooves of the support for securing the latter to the shell, a non-conducting element extending through the shell and provided with an electrical conductor terminating at its inner end in an electrode, electrodes carried by said element, electrodes carried by the support, and an electrode carried by the shell, said electrodes associated with each other. 30 35 40

In testimony whereof I affix my signature.

JOSEPH G. GAVLAK.