

G. ANGER.
SPARK PLUG.
APPLICATION FILED JAN. 24, 1917.

1,246,376.

Patented Nov. 13, 1917.

Fig. 1.

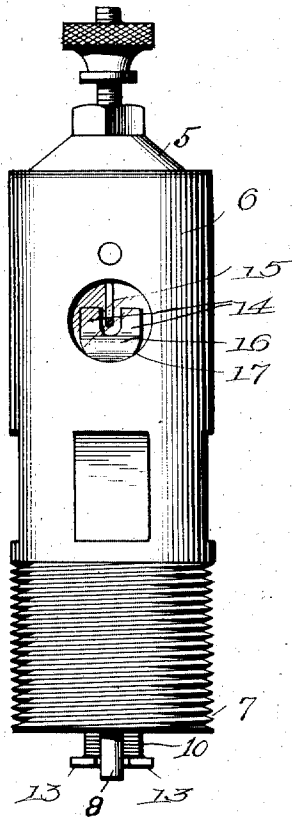


Fig. 2.

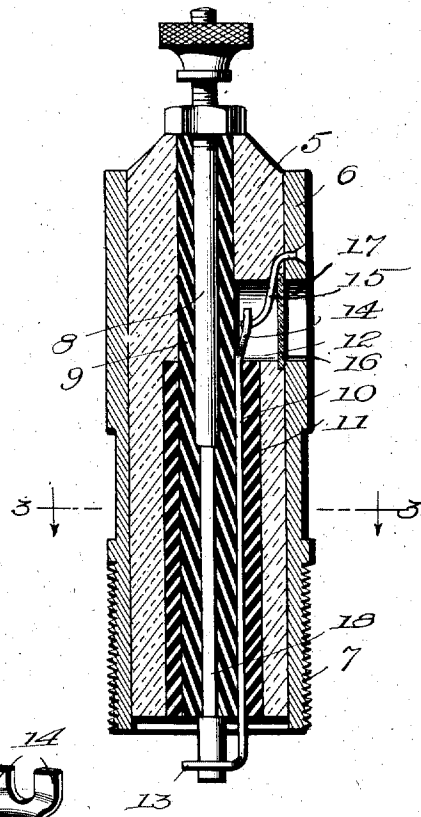


Fig. 3.

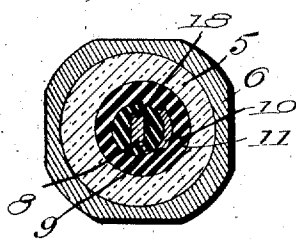
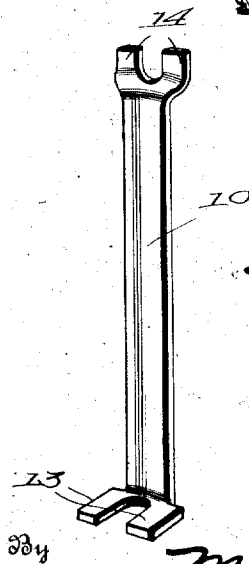


Fig. 4.



Inventor

G. Anger

Max A. Schmidt
Attorney

UNITED STATES PATENT OFFICE.

GOTTLIEB ANGER, OF McKEES ROCKS, PENNSYLVANIA.

SPARK-PLUG.

1,246,376.

Specification of Letters Patent.

Patented Nov. 13, 1917.

Application filed January 24, 1917. Serial No. 144,226.

To all whom it may concern:

Be it known that I, GOTTLIEB ANGER, a citizen of the United States, residing at McKees Rocks, 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 which are provided with an auxiliary sparking gap located on the outside of the cylinder so that the operation of the plug may be observed and any defects readily detected.

The invention has for its object to provide an efficient plug of the kind stated, and also one which is simple in construction so that it may be cheaply produced and sold.

The object stated is attained by means of a novel combination and arrangement of parts to be hereinafter described and claimed, and in order that the same may be better understood, reference is had to the accompanying drawing forming a part of this specification.

In the drawing,

Figure 1 is a side elevation of the plug;

Fig. 2 is a central longitudinal section thereof;

Fig. 3 is a cross-section on the line 3—3 of Fig. 2, and

Fig. 4 is a perspective view of one of the electrodes.

Referring specifically to the drawing, 5 denotes the body of the plug, the same being formed of a suitable insulating material. The body is housed in a metallic cylindrical shell 6 having one end externally screw-threaded, as shown at 7, for connection to the engine cylinder.

The plug 5 has a central longitudinal opening extending throughout its entire length, in which seats one of the electrodes 8, the latter being a rod which is incased in a packing sleeve 9 of insulation fitting snugly in the plug opening. The outer end of the electrode 8 is provided with the usual means for making the current conductor wire connection, and its inner end projects a short distance from the corresponding end of the plug. The shell 6 is open at its ends, leaving the ends of the plug and the sparking point of the electrode 8 exposed.

Alongside the electrode 8 is mounted a second electrode 10 which is also incased in a packing sleeve 11 of insulating material, said electrode and sleeve seating snugly in

an opening in the plug 5 and extending parallel to the electrode 8. The two electrodes are therefore effectually insulated from each other.

The electrode 10 does not extend throughout the entire length of the plug 5, but stops short of the outer end thereof, the plug body here having a side recess or opening 12 into which the outer end of said electrode extends. The electrode 10 is a flat bar having a lateral bend at one end which is divided or forked to form two sparking points 13. The other end of the bar is also formed with two sparking points 14. The sparking points 13 project from the inner end of the plug 5 and the corresponding end of the electrode 8 seats therebetween, these being the main sparking terminals of the plug.

The sparking points 14 of the electrode 10 are located in the recess 12 and between the same extends a secondary electrode or grounding terminal 15 which is a short piece of wire fastened to the metallic shell 6 and extending into the recess to seat between the sparking points 14. An auxiliary spark gap is thus produced in the recess 12 in order that the spark may here be observed. When a spark is produced in the recess 12, the observer has the assurance that the plug is sparking at the main spark gap in the cylinder. The recess 12 is fitted with a transparent closure 16 which may be a piece of isinglass or other suitable transparent material. This closure eliminates all danger of explosion of any gases which may be outside of the cylinder. In order that the shell 6 may not cut off the recess 12 from view, it is provided with an opening 17 in line with the recess.

A portion of the electrode 8 which is housed in the sleeve 9 is flattened, as shown at 18, so that it cannot pull out or turn in said sleeve. The electrode 10 is securely packed between the two layers 9 and 11 of insulation.

A plug constructed as hereinbefore described can be made and sold at a low price, and it is highly efficient in operation, the spark at the cylinder end of the plug being much stronger than that in the ordinary spark plugs now in use. If there is no spark at the auxiliary spark gap, the operator will know at once that the plug is not working properly, and the condition of the plug may therefore always be observed without removing it from the engine cylinder.

I claim:

1. A spark plug having a body of insulating material provided with a side recess, a shell of conducting material incasing said body and having an opening in line with the aforesaid recess, electrodes carried by the body and insulated from each other, the inner ends of the electrodes projecting from the body and being arranged to produce a spark gap therebetween, and one of said electrodes extending into the side recess, and a third electrode grounded on the aforesaid shell and extending into the recess, and co-operating with the last-mentioned electrode to produce a spark gap in said recess.

2. A spark plug having a body of insulating material provided with a side recess, a support of conducting material for said body, said support having means for connection with the engine cylinder, and provided with an opening in line with the aforesaid recess, electrodes carried by the body and insulated from each other, the inner ends of the electrodes being arranged to produce a main spark gap at the cylinder end of the plug, and one of the electrodes extending into the side recess, and a third electrode grounded on the aforesaid support and co-operating with the last-mentioned electrode to produce an auxiliary spark gap in the side recess.

3. A spark plug having a body of insulating material provided with a sight opening in its side, a support of conducting material for said body, electrodes carried by the body and insulated from each other, the inner

ends of the electrodes being arranged to produce a main spark gap at the cylinder end of the plug, and one of the electrodes extending into the sight opening, and a third electrode grounded on the aforesaid support and co-operating with the last-mentioned electrode to produce an auxiliary spark gap in said opening, the electrode which extends into the sight opening being a flat strip which has its ends divided to form two laterally spaced sparking points between which the other electrodes extend.

4. In a spark plug, an electrode comprising a flat strip having its end divided to form two laterally spaced sparking terminals, and a second electrode separate from the strip and having its sparking terminal located between said spaced terminals.

5. In a spark plug, a body of insulating material having a longitudinal opening, a support of conducting material for said body, an electrode rod, and a packing in which the rod is inclosed, said packing and the rod being mounted in the aforesaid opening, and a portion of the rod inclosed in the packing being flattened to prevent longitudinal and rotary movement of the rod in the packing, said rod projecting from the outer end of the insulating body and having thereat means for current conductor connection.

In testimony whereof I affix my signature in the presence of two witnesses.

GOTTLIEB ANGER.

Witnesses:

CHAS. F. ENGEL,

AGNES DOUGHERTY.