

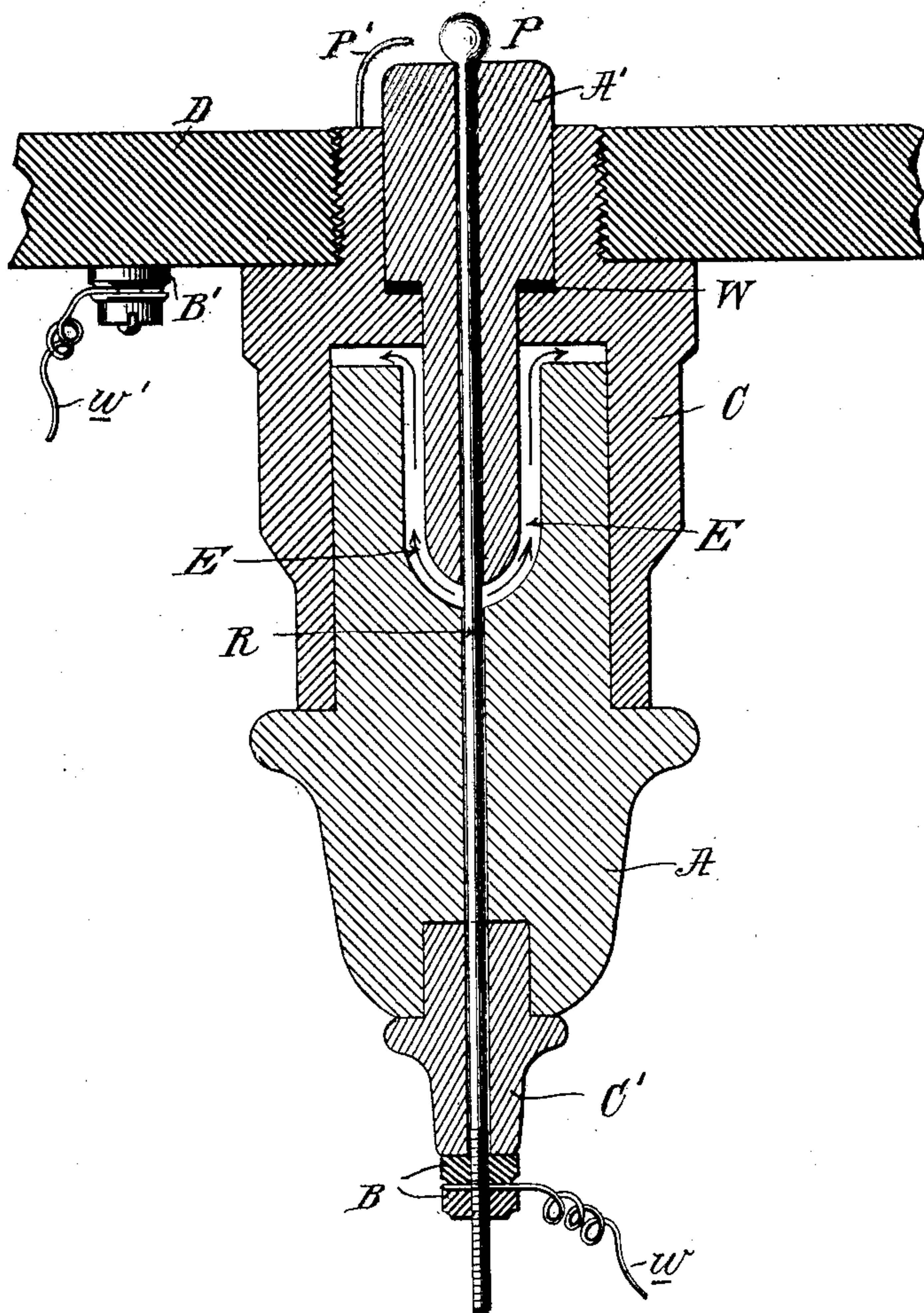
No. 660,786.

Patented Oct. 30, 1900.

E. T. BIRDSALL.
SPARKING PLUG FOR EXPLOSIVE ENGINES.

(Application filed May 9, 1900.)

(No Model.)



Witnesses:
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UNITED STATES PATENT OFFICE.

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SPARKING-PLUG FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 660,786, dated October 30, 1900.

Application filed May 9, 1900. Serial No. 16,040. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. BIRDSALL, a citizen of the United States, and a resident of New Rochelle, county of Westchester, and State of New York, have made a new and useful Improvement in Sparking-Plugs for Explosive-Engines, of which the following is a specification.

My improvement has for its object the construction of a sparking-plug for a gas or other explosive engine in such manner that the best insulating effects may be had where the igniting electrical currents utilized are of high potential, and it will be fully understood by referring to the accompanying drawing, which is a sectional view illustrating a part of one side or end of an explosion-chamber of an ordinary gas or explosive engine and my improved sparking-plug attached thereto, the supported sparking-electrodes being shown in position in side elevational view.

Prior to my improvement it was the custom to support or sustain the insulated electrode of an explosive-engine in a single tube of relatively small diameter, said tube being made of porcelain, glass, or equivalent insulating material and sustained in turn by a detachable metallic plug screw-threaded into the end or side of the explosion-chamber of the engine, the other electrode being secured to the inner end of the metallic plug, with its free end in close proximity to the first-named electrode. It is found, however, that with this type of electrode-supporting plug it becomes necessary to use an insulating-tube of such small diameter that in the handling or use of the engine or in the insertion or removal of the plug the insulating-tube is often broken, thereby affording a short-circuit passage for the high-potential currents from the insulated electrode-rod directly to the surrounding metallic portion of the plug and thence to the return-conductor, usually secured to some metallic part of the engine. A sparking-plug has also heretofore been constructed in which the insulating-tube is made in two sections, the outer section of which is of larger diameter than the inner section and is adapted to fit within an enlarged chamber in the outer end of the metallic plug, the space within said chamber between the two sections

of insulating-tubing being packed with an insulating medium, such as asbestos. With such structures, however, it is not always possible to effect the best insulation. My improvement contemplates the construction of a sparking-plug in which the insulating supporting-tube for the insulated electrode is made in sections (two or more in number) and united together within the supporting-plug without the intervention of any packing medium, the arrangement being such that the path offered to the flow of the current from the insulated electrode to the surrounding supporting metallic plug is greater at the junction of the two sections of tubing than is that offered between the inner ends of the two electrodes within the explosion-chamber.

Referring now to the drawing in detail, in which like letters of reference represent like or equivalent parts wherever used, D represents one side or end of the explosion-chamber of any well-known form of gas or similar explosive engine, and B' a binding-post secured thereto in the usual manner and adapted to secure one of the conductors *w'*, running to a source of high potential electrical energy, as the secondary of an induction-coil, and such as is ordinarily used in connection with explosive-engines, the other pole of said electrical source of energy being connected by a conductor *w* to a conducting electrode-rod R, which constitutes the insulated electrode of the engine, the inner end P thereof being located in close proximity to a stationary electrode P', secured to the inner end of a metallic supporting-plug C, attached to the explosion-chamber by screw-threads, as shown.

A and A' represent my improved supporting insulating-tubes, the same consisting of two parts fitting when in position the end of one within the end of the other, or "nested," so to speak, so that the elongated air-space E between the electrode-rod R and the metallic supporting-plug C is, as indicated by the curved arrows, much greater in distance than is the distance between the electrodes P and P' within the explosion-chamber. The inner section A' of the two-part tube is shouldered, as shown, and adapted to rest upon a sealing-washer W, preferably of asbestos.

The outer section of the tube A is shouldered, as shown, and adapted to rest against the outer end of the metallic supporting-plug C. A third section C' is shouldered, as shown, and adapted to fit within the outer end of the section A, all of said parts being assembled, as shown, and held together by a double binding-nut B, one portion of which is adapted to hold the parts all firmly or securely together, while the other portion thereof acts as a set-nut and at the same time as a binding-nut for the conductor *w*. It will be apparent that by reason of the curvilinear form of the air-space E between the two sections A and A' of the insulating-tube which supports the electrode-rod R there is offered a very much longer path for the flow of the current from the rod R to the metallic supporting-plug C than there is to the flow of said current between the two electrodes P and P'. I do not limit myself to any definite number of such nested sections of insulating-tubing for supporting the insulated electrode in the sparking-plug of a gas or other explosive engine, as the same may be made up of any number thereof, as desired, it being obvious that there is little liability to breakage when the sections of such tubing are relatively short as compared to the length of the entire structure, although I prefer to make such sparking-plugs in the manner shown.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A sparking-plug consisting of a metallic supporting-plug and two or more insulating-tubes having their ends only "nested" the one within the other; in combination with an electrode-rod extending therethrough, and means for securing said parts together, substantially as described.

2. A sparking-plug consisting of an electrode-rod surrounded by two or more insulating-tubes having an elongated air-space between their adjacent ends only; in combination with a metallic supporting-plug adapted to support all of said parts, substantially as described.

3. A sparking-plug consisting of a metallic supporting-plug C; an electrode P' secured to the inner end thereof; an electrode-rod R having an electrode P at its inner end; two or more insulating-tubes A', A, "nested" the one within the other so as to constitute an elongated air-space; in combination with means for holding all of said parts together, the arrangement being such that the air-space between the electrode-rod R and the metallic supporting-plug C is greater than the air-space between the two electrodes P and P', substantially as described.

4. A sparking-plug consisting of a metallic supporting-plug C provided with means for securing it to the explosion-chamber of an engine; an electrode P' secured to the inner end thereof; an electrode-rod R provided with an electrode P; two insulating-tubes A', A, through which the electrode-rod R extends when in position, the outer end of the tube A' extending into an air space or chamber within the inner end of the tube A; in combination with a sealing-washer W between the tube A' and the plug C; together with a section C' and binding-nuts B and B' adapted to secure all of said parts together, substantially as described.

In testimony whereof I hereunto subscribe my name this 8th day of May, 1900.

EDWARD T. BIRDSALL.

Witnesses:

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