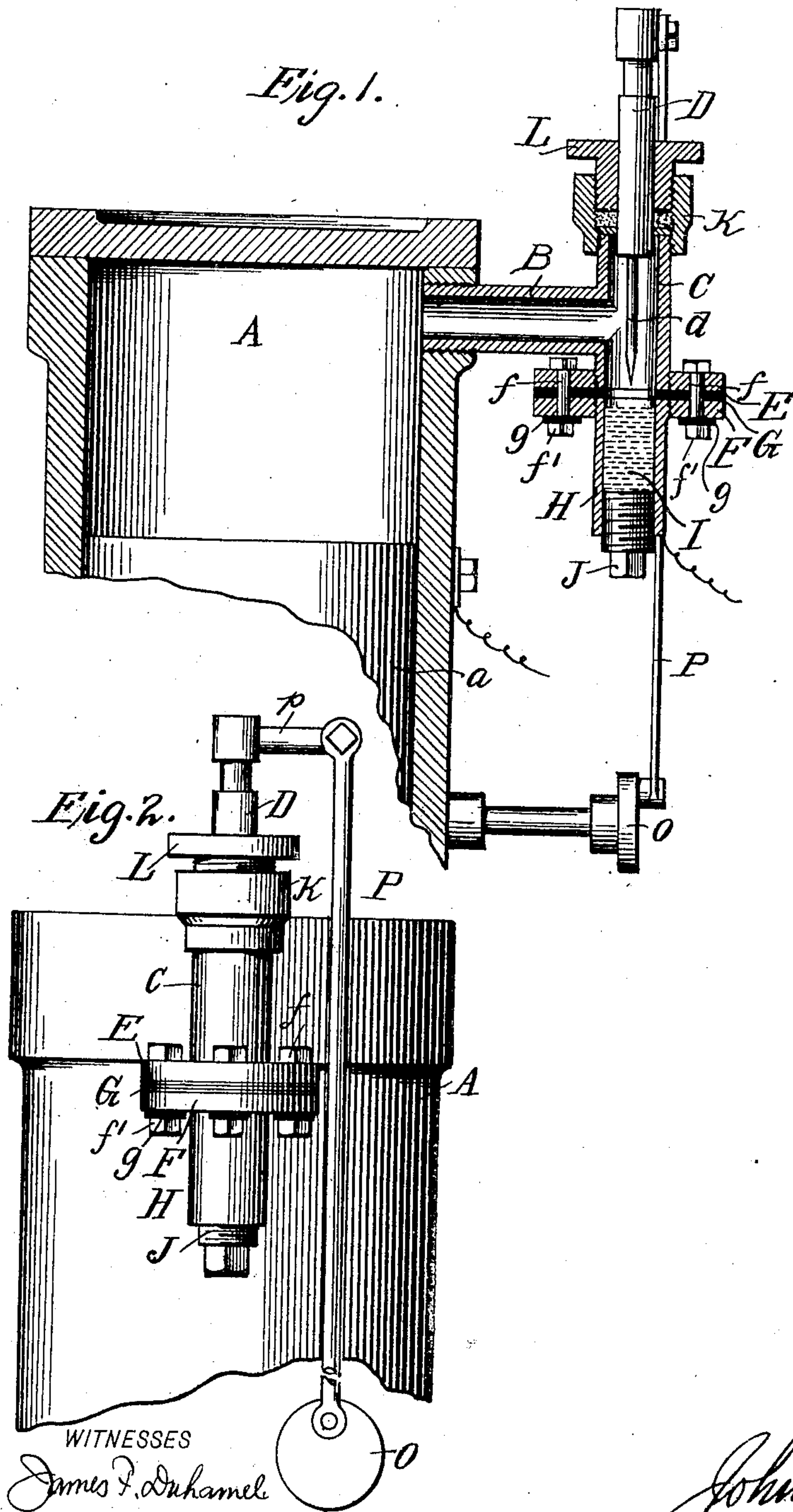


No. 881,954.

PATENTED MAR. 17, 1908.

J. V. RICE, JR.
IGNITING DEVICE FOR GAS ENGINES.

APPLICATION FILED JUNE 22, 1908.



WITNESSES

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JOHN V. RICE, JR., OF BORDENTOWN, NEW JERSEY.

IGNITING DEVICE FOR GAS-ENGINES.

No. 881,954.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed June 22, 1906. Serial No. 322,814.

To all whom it may concern:

Be it known that I, JOHN V. RICE, Jr., a citizen of the United States of America, and a resident of Bordentown, county of Burlington, State of New Jersey, have invented certain new and useful Improvements in Igniting Devices for Gas-Engines, of which the following is a specification.

My present invention relates to an improvement in igniting devices for gas engines, the object being to provide a more perfect and efficient device of this character in order that the explosions within the cylinder may take place with greater regularity, speed and effectiveness; and the invention consequently consists essentially in the construction, arrangement and combination of parts substantially as will be hereinafter described and then more particularly pointed out in the appended clauses of the claims.

In the annexed drawing illustrating my invention: Figure 1 is a vertical sectional view of my improved igniting device for gas engines; Fig. 2 is a side elevation of the same.

Like letters of reference designate like parts in all the different figures of the drawing.

A denotes a vertical cylinder containing the explosion chamber of a gas or other explosive engine and in this cylinder is the piston *a*. I have delineated cylinder A and piston *a* simply by way of example in order to more satisfactorily exhibit the application of the invention. A horizontal cylinder A', containing piston *a* is shown in Figs. 4, 5, 6 and 7. The cylinder may obviously belong to a gas-engine, gas rock drill, or other machine.

Leading from the cylinder or explosion chamber A is a short tube or outlet pipe B which is screwed into the wall of the cylinder A, or otherwise attached thereto at such a point as to contain a portion of the explosive mixture which fills the cylinder, and the explosions of which generate the pressure for operating the engine. The branch or outlet pipe B is preferably horizontal and is connected to, or made integral with a vertical tube C, which I designate the spark tube.

On the upper end of the spark tube C is a screw cap K having a central opening. A packing gland L or screw plug screws into the cap K, a suitable packing being interposed between the lower end of the plug L and the inner bottom face of the cap K, as is clearly shown in Fig. 1. The plug is cen-

trally perforated. Arranged within the plug L and the cap K in such a manner as to reciprocate vertically therein, is a spark rod D, carrying on its lower end a point *d* which serves as one of the electrodes of the sparking mechanism, said point *d* being reciprocated up and down in consequence of the up and down movement of the rod D.

The lower end of the spark tube C screws into the central orifice of a disk or plate E, or is otherwise suitably attached to said plate. Beneath plate E is a similar plate F, a sheet of some suitable insulating material G being interposed between the two plates E and F, and said plates being fastened securely to each other by means of the bolts *f* that carry on their lower ends nuts *f'* said nuts being insulated from the plate F by means of insulating washers *g*. Also, the bolts *f* are surrounded with insulating material as shown. The purpose of the insulating as described is to effectually separate the two plates E and F from each other, in order that the current may not be transmitted from one to the other. The lower plate F carries a vessel or receptacle as H, secured centrally thereto, and depending beneath the same. This vessel comprises preferably a short tube alined in the same vertical line with the spark tube C and with its upper end screwed into a central opening in the plate F. At the lower end of the tube H is inserted a screw plug J, which serves as the bottom of the receptacle. This receptacle contains mercury, quicksilver, or any subdivided metallic substance, which forms the other electrode of the sparking mechanism. The level of the mercury relatively to the end of the reciprocating electrode *d* is governed or controlled by means of the adjustable bottom J of the mercury-containing vessel.

The conspicuous and important feature of this invention and the one on which I desire to place the greatest stress, is the use of mercury, quicksilver, or any subdivided metallic substance, as one of the electrodes in a sparking mechanism for an explosive engine. A liquid or fluid metal contact of this kind, or one consisting of finely comminuted metallic material, possesses a multitude of advantages over the ordinary spring fingers or metal projections. One advantage is the entire absence of friction, enabling the spark to produce spark after spark with great rapidity, and yet without any wear upon the contacting electrodes. In actual

practice I have been able to operate a gas engine at three thousand or four thousand revolutions per minute with a sparker of the kind I am now describing, the latter operating with perfect ease and efficiency and with absolutely no wear upon the parts. It must be understood therefore, that I desire in the present application to claim this point of the use of a subdivided metallic substance in a sparking mechanism as broadly as it is possible to claim the same, reserving to myself the right to modify in the greatest variety of ways, the arrangement and application of the said substance for use in accomplishing the purpose in view.

One of the battery wires I attach to the mercury-containing vessel, as shown in Fig. 1, while the other wire is attached to the cylinder A or some other part of the engine, it being understood that in this way both contacts are energized.

In the mechanism of Figs. 1 and 2 the reciprocation of the movable electrode is accomplished by connections between a crank disk O on the main shaft, and the upper end

of the rod D, said connections consisting for example, of a link P and an arm *p*, which arm is fastened rigidly to the upper end of the rod D, while the upper end of the link P is fastened rigidly to the outer end of said arm *p*.

Having thus described my invention what I claim as new and desire to secure by Letters-Patent, is:—

In a sparker, a fluid metal electrode consisting of mercury or quicksilver, a receptacle therefor, said receptacle having an adjustable bottom, in combination with a movable electrode, a main shaft, a crank disk thereon, and a rod connecting said crank disk with the movable electrode, all arranged so that the reciprocation of said movable electrode may be accomplished by the connections between it and the main shaft.

Signed at New York this 29th day of May 1906.

JOHN V. RICE, JR.

Witnesses:

JOHN H. HAZELTON,
C. B. SCHROEDER.