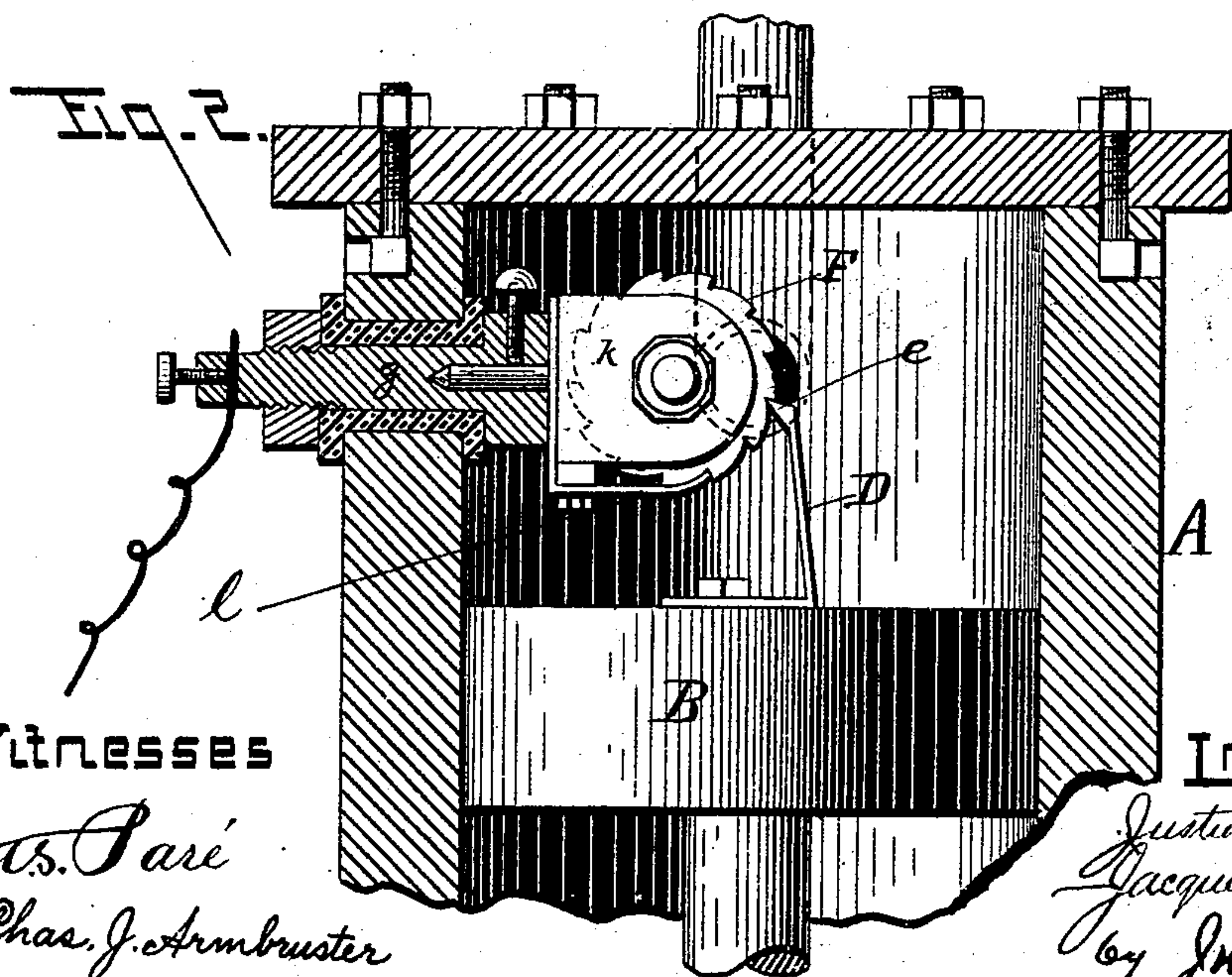
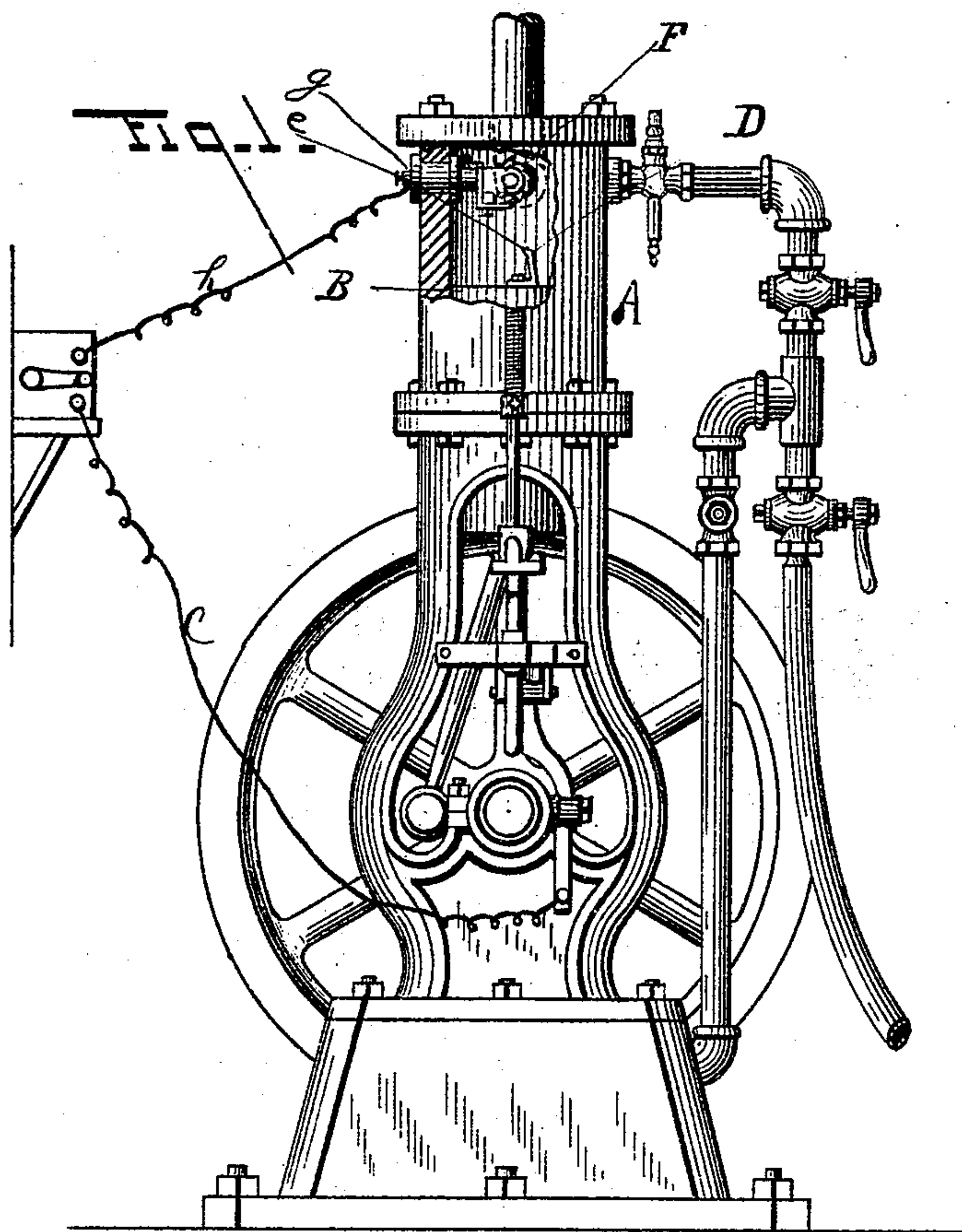


(No Model.)

J. LABATAILLE & J. J. GRAFF.
GAS ENGINE.

No. 517,821.

Patented Apr. 3, 1894.



Witnesses

As. Paré
Chas. J. Armbruster

Inventors

Justin J. Graff
Jacques Labataille
by *Jno. L. Boone*
Attorney

UNITED STATES PATENT OFFICE.

JACQUES LABATAILLE AND JUSTIN J. GRAFF, OF SAN FRANCISCO,
CALIFORNIA.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 517,821, dated April 3, 1894.

Application filed June 22, 1893. Serial No. 478,491. (No model.)

To all whom it may concern:

Be it known that we, JACQUES LABATAILLE and JUSTIN J. GRAFF, citizens of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Gas-Engines; and we do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

Our invention relates to an improved device for producing an electric spark in the cylinder of a gas or vapor engine for the purpose of igniting the charge of gas that serves by its explosion to drive the piston of the engine.

Our improved gas igniter consists of a toothed wheel similar to a ratchet wheel mounted on a shaft inside the cylinder and connected electrically with one of the poles of the electric battery, in combination with a spring projection on the piston head, in such relation to the ratchet wheel that as the piston approaches the end of its stroke the spring projection will strike against one of the teeth of the wheel and cause it to rotate the distance of a tooth. The piston head and spring projection are connected with the other pole of the electric battery, so that when the piston starts to return the point of the spring projection will brush back over the face of the next tooth and create a spark when the projection leaves the point of the tooth, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 is an elevation of a gas engine with a part of the cylinder broken away to show the igniting device, and Fig. 2. is a sectional elevation of the upper part of the engine cylinder showing the electric gas igniting device in enlarged parts.

Let A represent the cylinder of a gas or vapor engine and B the piston, which moves in the cylinder. One of the wires C from the electric battery, which is used to generate the electric spark for igniting purposes, is connected with the cylinder of the engine, so that the piston B, by contact with the cylinder, is brought into the electric circuit. On the piston head B is a broad steel or other metal

spring projection D, which may be straight or curved, and on the extreme end of the spring on one side is a rib *e*, which forms an offset or rectangular projection on one side of the point of the spring. This spring and its rib form one of the electrodes of the battery. The length of this spring and its location on the piston head will be readily determined by any competent mechanic.

To the head or end of the cylinder, and in line with the spring electrode of the piston head, so as to be actuated by it, we secure a metallic ratchet wheel F by means of a spindle *g*, which passes through a hole in the cylinder and is insulated from the cylinder by some insulating substance or material interposed between the spindle and the base of the hole. The spindle *g* is connected by wire *h* with the other pole of the electric battery, so that the ratchet wheel is brought into the circuit and forms the other electrode of the battery. The ratchet wheel F is mounted on a shaft between two side plates *k*, which project from the spindle *g*, and it is so placed that the shoulders of the teeth will be successively struck by the end of the spring projection D of the piston head and the wheel thereby partially rotated in one direction by the push of the spring as the piston approaches the end of its stroke. The wheel and spring projection are so adjusted that the distance that the wheel is rotated forward at each stroke is equal to the length of one of the ratchet teeth. A pawl *l* prevents the wheel from rotating backward after it has been rotated forward by the spring projection, so that when the piston begins to move in a reverse direction the rib or angular point of the spring is drawn across the face of the tooth on which it rests, and as the point of the spring leaves the end of the tooth a spark is generated, which fires the gas in the combustion chamber of the cylinder. The effectiveness of this device is produced by the rotation forward of the ratchet wheel, because the rotation throws the face of the tooth over which the end of the spring passed in making its direct stroke upward, so that as the spring is drawn back by the retrograde movement of the piston the end of the spring is pressed upon and rubbed hard over the face of the tooth until it drops off its end

where the spark is produced. The wheel is thus kept rotating and bringing a new or fresh tooth to be acted upon by the spring projection at each stroke of the piston. The face
5 of the ratchet teeth may be made as broad as desired and thus give a large contact surface which will produce a large spark, thereby insuring a positive ignition of the gas at each stroke of the piston.

10 Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. An electric igniter for gas engines, consisting of a ratchet wheel mounted inside the
15 cylinder and electrically connected with one of the poles of the battery, in combination with a spring projection on the piston head, connected with the other pole of the battery and adapted to actuate the ratchet wheel and

rub over the face of the tooth on its retro- 20 grade movement, substantially as described.

2. In a gas igniting device for gas engines; a rotary electrode having ratchet teeth and a pawl adapted to prevent backward rotation, in combination with a spring projection on
25 the piston head, adapted to engage with one tooth of the ratchet at each stroke of the piston, substantially as described.

3. In a gas igniting device for gas engines, the combination of a revolving electrode and
30 a reciprocating electrode intermittently actuating the revolving electrode, substantially as set forth.

JACQUES LABATAILLE.
JUSTIN J. GRAFF.

Witnesses:

CHAS. J. ARMBRUSTER,
JAMES C. ADAMS.