

No. 736,734.

PATENTED AUG. 18, 1903.

L. JONES.

ELECTRIC IGNITER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED FEB. 21, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

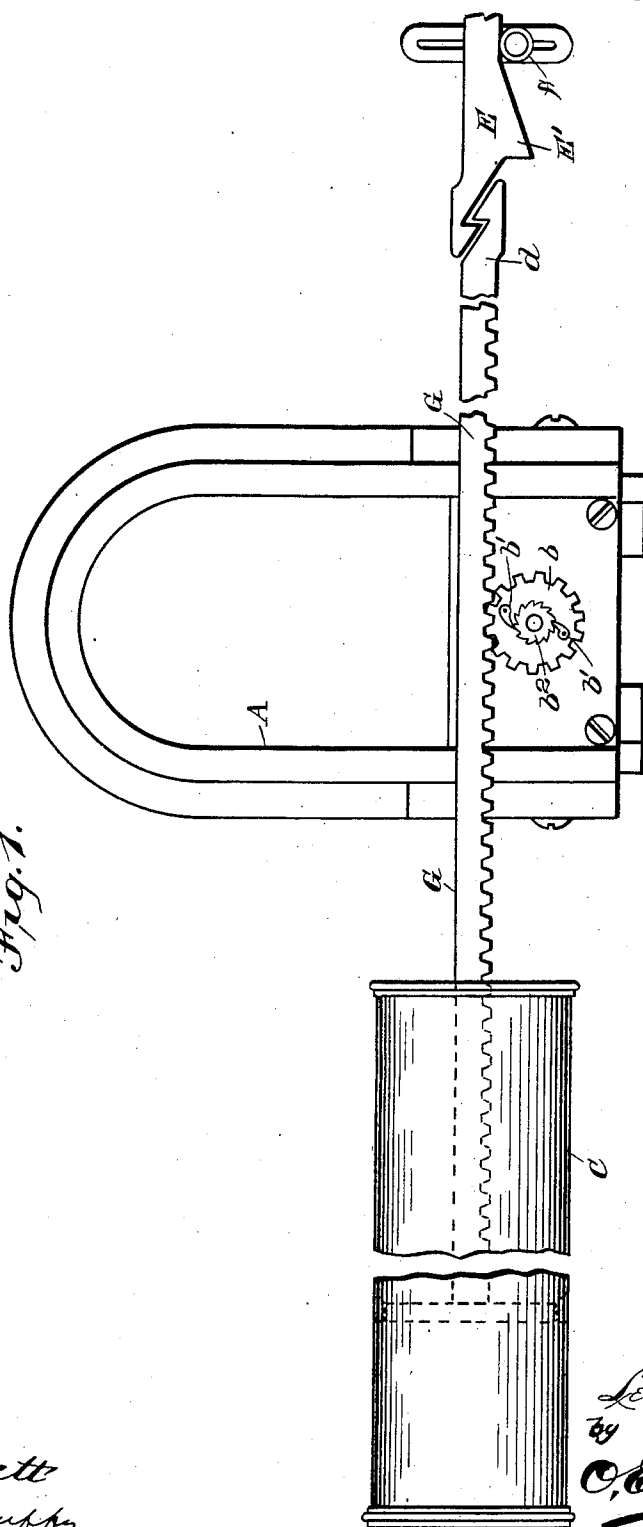


Fig. 1.

Witnesses

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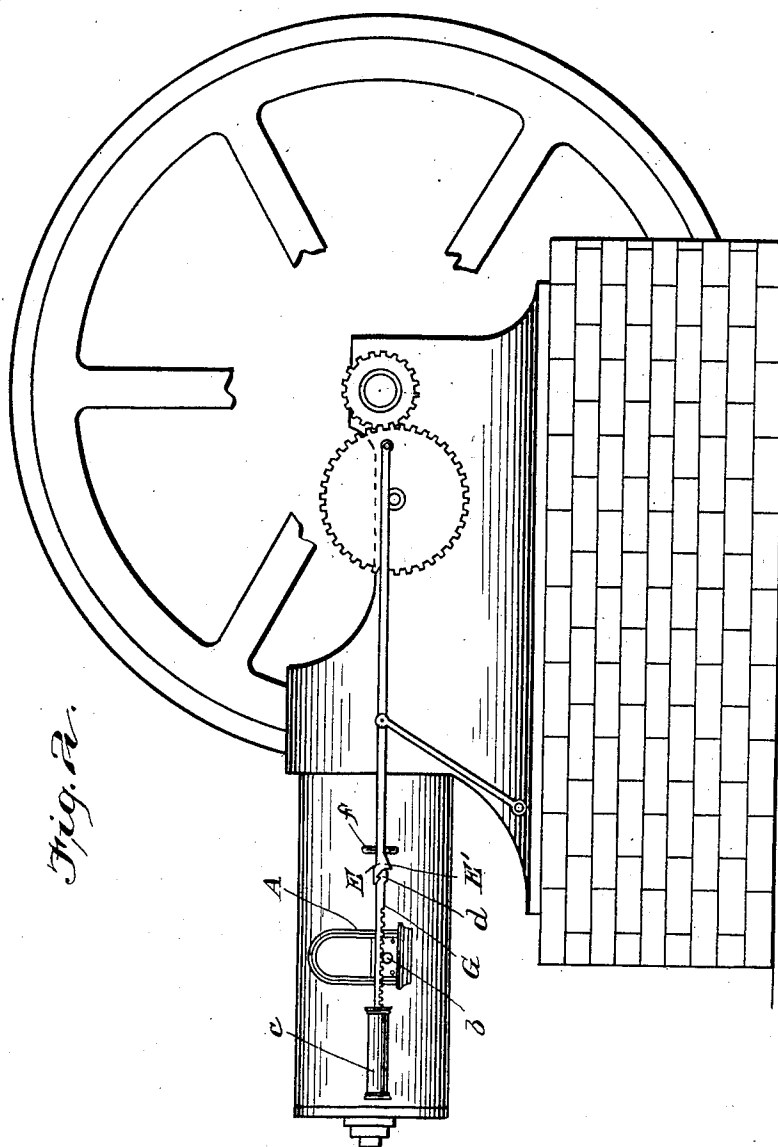
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4 SHEETS—SHEET 2.



Witnesses

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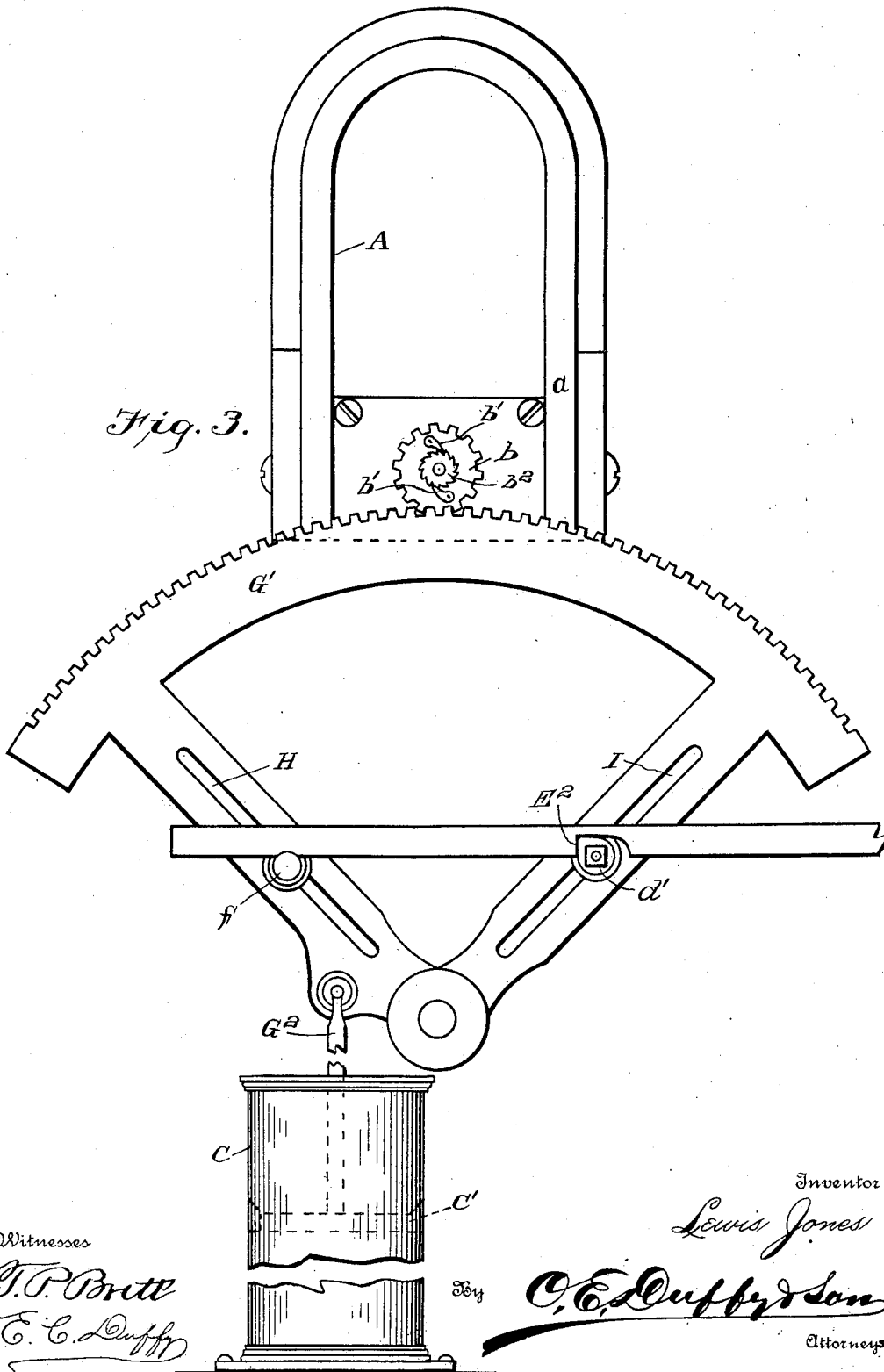
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4 SHEETS—SHEET 3.



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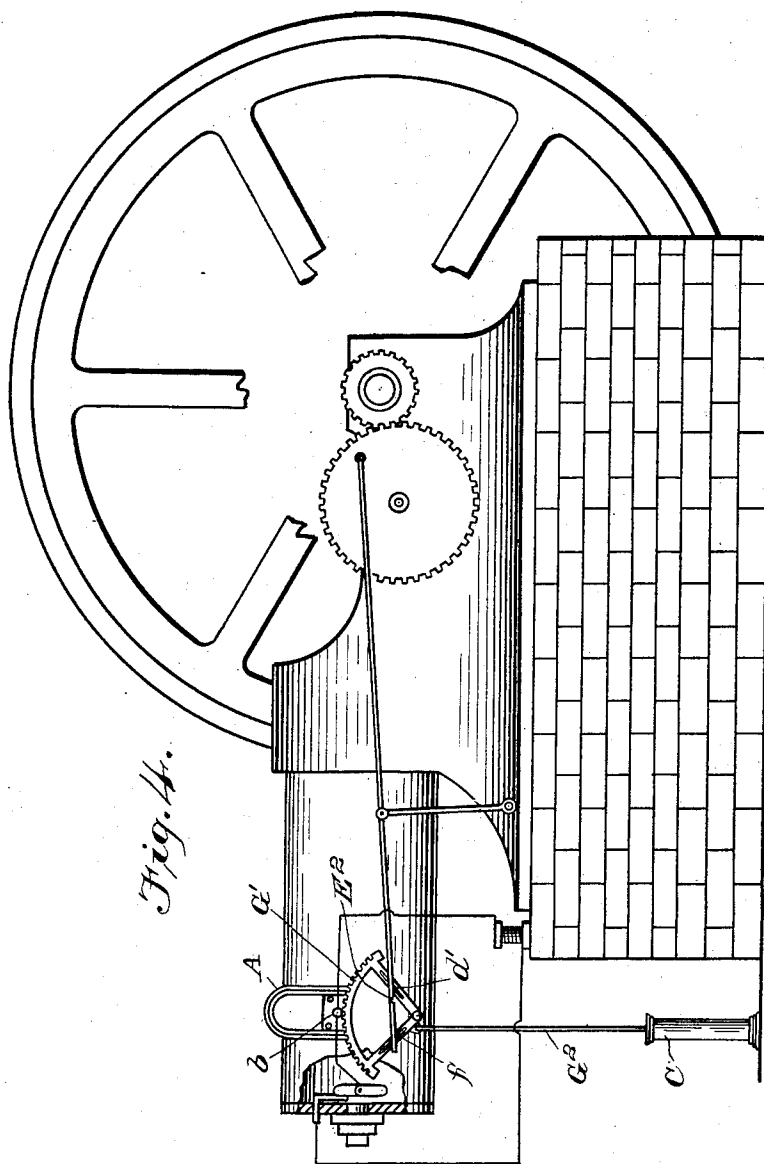


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

LEWIS JONES, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRIC IGNITER FOR INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 736,734, dated August 18, 1903.

Application filed February 21, 1903. Serial No. 144,521. (No model.)

To all whom it may concern:

Be it known that I, LEWIS JONES, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Electric Igniters for Internal-Combustion Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to electric igniters for internal-combustion engines; and it consists of a small dynamo (either direct or alternating current) operated by a dash-pot intermittently and only when current is needed to ignite the gaseous charge in the engine-cylinder.

The object of my invention is to produce a strong electric spark independent of the speed of the engine, so that when the engine is turned slowly by hand, as in starting, the generator will give off current and a consequent spark of the same strength as if the engine were running at full speed and that the generator may remain entirely at rest, except the short interval when the spark is needed, thereby reducing the wear and tear on same and the power consumed in operating. A high rate of speed has been required to produce the current, so that it is difficult to start the engine by hand, while the use of generators capable of producing the required sparks at a lower rate of speed necessitates such an increase of size in the generator as to make them objectionable from their cost, the amount of room which they occupy, and the necessity of employing speed-multiplying devices for use in operating by hand until the normal speed of the engine is obtained. Again, the commutators of small generators wear out with great rapidity when kept constantly in motion at a high rate of speed and have to be replaced frequently, as do also the brushes. The bearings wear away with great rapidity, and when the generator runs upon a closed circuit it absorbs an objectionable percentage of the power of the engine.

With these objects in view my invention

consists in producing a current by a few rapid revolutions of the generator by the action of a dash-pot or similar means geared thereto by a quadrant or a toothed rack, giving a positive motion and insuring a spark of sufficient intensity to absolutely secure the ignition of the gaseous charge by a single movement of the dash-pot, and the generator is allowed to remain entirely at rest during the interval when no current is required.

My invention also consists in certain other novel features and in combination of parts, which will be first fully described and afterwards specifically pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is an enlarged view in elevation of the various parts of my improved igniting device. Fig. 2 is an elevation of a gas-engine with my igniting device in one form attached. Fig. 3 is a modification of Fig. 1. Fig. 4 shows the modified form shown in Fig. 3 attached to a gas-engine.

Like letters of reference indicate the same parts throughout the several figures, in which—

A is a magneto or electric generator of any approved type, and *b* is a pinion loosely journaled on the armature-shaft, which carries a series of pawls *b'*, and *b''* is a ratchet secured on the armature-shaft and engaged by said pawls.

C is a dash-pot arranged in any suitable manner, or in place thereof I may employ a spring or any like device.

d is a hook on the rack-stem of the dash-pot, (shown in Figs. 1 and 2,) which engages a hook E on a reciprocating part of the engine.

f is an adjustable releasing device secured to an engine, which is adapted to be struck by a downwardly-inclined portion E' on the hook portion E on the return stroke of said reciprocating part.

In the modification, G' is a quadrant, which is connected to the stem G² of the dash-pot C, the teeth on the quadrant G' meshing in those on pinion *b*, as shown in Figs. 3 and 4.

The above-mentioned mechanism assembled and mounted on or near the engine and electrically connected to the spark-plug in the combustion-chamber its operation is as

follows: Beginning with the piston C' of the dash-pot C at its extreme inward travel the engine is turned, and the hook E on the engine, preferably a part of the engine making a double stroke for each explosion, engages with hook d on the rack-stem G of the dash-pot C and draws the piston outward. During this outward motion the pinion b revolves on the armature-shaft. When the outward stroke is completed, the releasing device f is struck by the downwardly-inclined portion E', which lifts hook E out of engagement, which allows the piston and rack-stem of the dash-pot to recede, rapidly revolving the pinion b in the direction that brings the ratchet and pawls into engagement and drives the armature several revolutions, sufficient to produce a violent spark or series of sparks in the engine-cylinder, which explodes the gaseous charge. The releasing device f is made adjustable to allow the correct timing of the explosion.

In Fig. 3 a slight modification of construction is shown. A quadrant G' is used to communicate the motion to the armature instead of a toothed rack. A slot H in said quadrant is provided for the releasing device f, and a similar slot I is provided for the rod-engaging device d', and a portion is cut out of the reciprocating part to form a shoulder E² to be engaged by the device d', said releasing and engaging devices being arranged for adjustment to allow the stroke of the engine and the igniting device to be accommodated to each other. The adjustable releasing device is placed on the opposite side of the quadrant to that of the engaging device, so that when the quadrant oscillates the releasing device f will come in contact with the extended end of shoulder E² and raise the same so as to release the oscillating part at the proper time.

Having thus fully set forth my invention, I do not wish to be understood as limiting myself to the exact construction herein set forth, as various slight changes may be made

in form and construction which would fall within the limit and scope of my invention, and I consider myself clearly entitled to all such changes and modifications.

What I claim as my invention, and desire to protect by Letters Patent of the United States, is—

1. The combination with an engine of an electric generator, a rotating armature therefor, means for rotating said armature; means for detachably connecting said rotating means to a reciprocating part of the engine, and means for moving said rotating means, when said means is detached from said reciprocating part.

2. The combination with a gas-engine of an electric generator, a rotating armature therefor, means for rotating said armature, means for connecting said rotating means to a reciprocating part of the engine, an adjustable releasing device for disconnecting said rotating means from said reciprocating part, and means for moving said rotating means when thus disconnected.

3. The combination with a gas-engine and rotating-armature generator of a dash-pot, of a toothed rack adapted to gear said dash-pot to the armature-shaft, and means for causing a rapid rotation of the armature by a single return stroke of the dash-pot.

4. The combination with a gas-engine and rotating-armature generator with a dash-pot geared thereto, a stem for said dash-pot adapted to engage with a moving part of the engine, means for causing the hook to become disengaged at any desired point, said dash-pot causing the piston to recede quickly and rotate the armature at a high rate of speed.

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

LEWIS JONES.

Witnesses:

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C. HUGH DUFFY.