

No. 685,860.

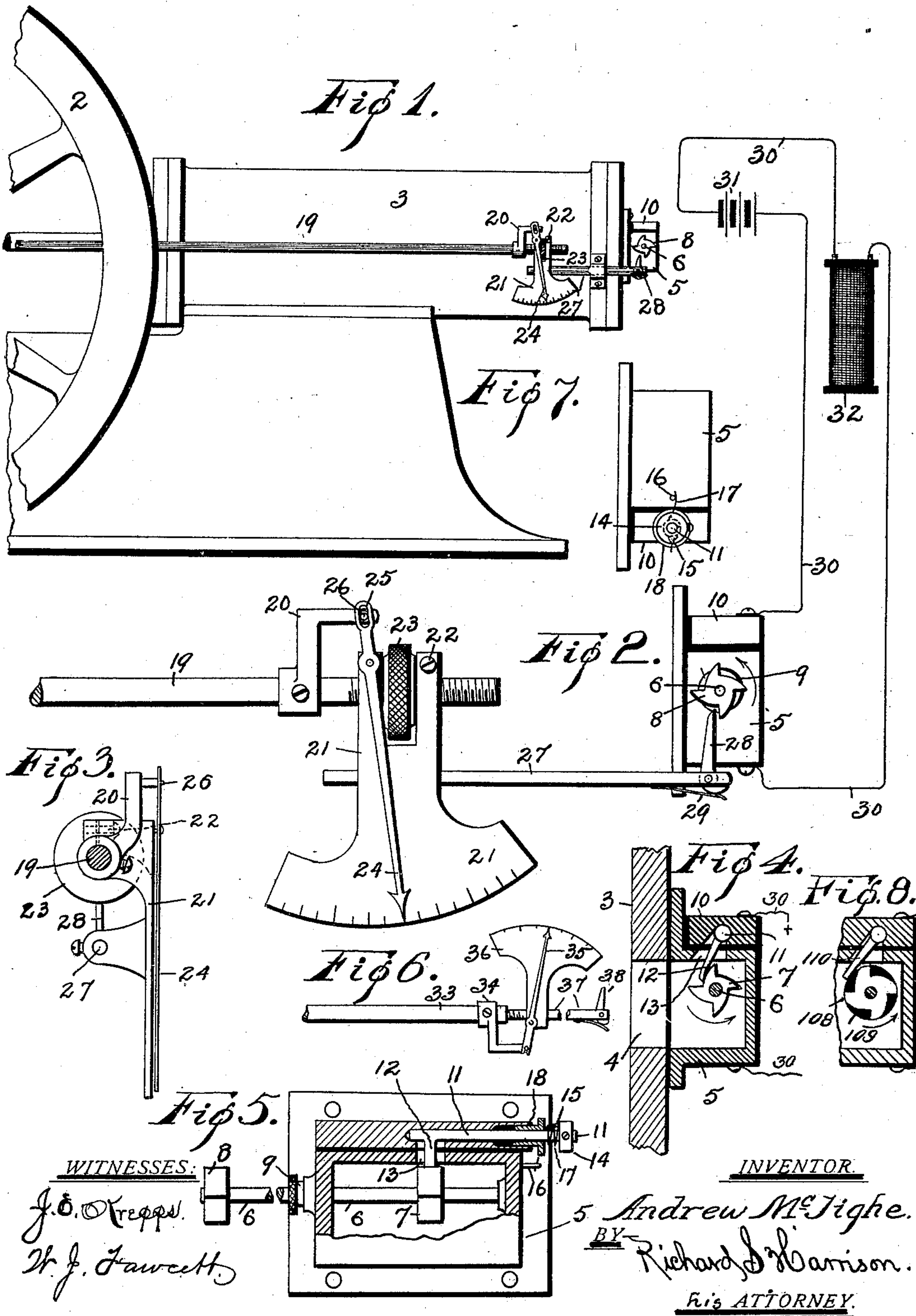
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A. MCTIGHE.

INDICATING DEVICE FOR SPARKING IGNITERS OF GAS ENGINES.

(Application filed Jan. 8, 1901.)

(No Model.)



WITNESSES:

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INDICATING DEVICE FOR SPARKING-IGNITERS OF GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 685,860, dated November 5, 1901.

Application filed January 3, 1901. Serial No. 41,948. (No model.)

To all whom it may concern:

Be it known that I, ANDREW MCTIGHE, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Indicating Devices for Sparking-Igniters of Gas-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to certain new and useful improvements in that class of igniters which are known in the art as "wipe-sparkers."

The invention has for its object the provision of an igniter that will be positive in its action, capable of adjustment to cause ignition at any point of the stroke, and a means of indicating the precise point at which the ignition occurs.

In the accompanying drawings I have shown a mechanism or device by which my objects may be attained.

In said drawings, Figure 1 is a side elevation of a gas-engine having the device connected thereto. Fig. 2 is an enlarged side elevation of the device removed from the engine. Fig. 3 is an end view of a portion of said device. Fig. 4 is a sectional side elevation through the ignition-case and a portion of the cylinder. Fig. 5 is an end view of the ignition-case, partly in section and disclosing the interior mechanism. Fig. 6 is a side elevation of a portion of the mechanism, having a slight variation on its parts. Fig. 7 is a view of the opposite end of the igniter-case. Fig. 8 is a view of a modified form of sparking device.

In the drawings the numeral 1 designates the bed-plate of a gas-engine, 2 the fly-wheel, and 3 the cylinder.

In this instance I have shown the device attached to a horizontal type of gas-engine for the purpose of illustrating its action, but it may be attached to any other form with equally as good results.

Formed within either the head or wall of the cylinder or explosive-chamber is the opening 4. Secured over this opening is the case 5, which has rotatably mounted therein the

longitudinal shaft 6. Mounted upon this shaft within the case is the circuit-breaking or toothed wheel 7, and upon one end is mounted a ratchet-wheel 8. To prevent leakage at the wall of the case where the shaft enters, I employ a stuffing-box 9.

Insulatedly secured to one side of the case is the plate 10, having a longitudinal opening formed therein for the reception of the shaft 11. This shaft is provided with a contact-piece or pawl 12 to engage the toothed circuit-breaking wheel 7, said pawl projecting inwardly through opening 13. The outer end of this shaft is provided with an adjustable collar 14, carrying a pin 15. Another pin 16 projects from the side of the case, and to these pins is attached the spiral spring 17, whereby tension may be placed upon the shaft to insure the pawl making contact with the toothed wheel. To prevent possible leakage at the point where the shaft enters the plate, a stuffing-box 18, similar to that of the other shaft, is employed.

A rod or shaft 19, reciprocated by any suitable means in connection with the engine, such as a cam or crank, is suitably attached to the engine. This shaft is threaded at one end and carries an adjustable bracket 20. A plate 21, forked at one end and having a graduated arc at the opposite end, is mounted upon the threaded end of the said reciprocated shaft. One prong of this plate is split and is provided with a set-screw 22, by which it is made fast to the shaft. A nut 23 is mounted upon the threaded end of the shaft between the plate-prongs, so that said plate may be adjusted when desired. Pivotaly attached to the opposite prong of the said plate is the hand 24. This hand is provided with an oblong slot 25 at its short end, which engages with a pin 26, carried by the bracket 20.

To the rear of the graduated plate is attached a rod 27. This rod has attached to one end a pivoted pawl 28 to engage the toothed wheel 8, and in order to hold this pawl and return it to its normal position after engagement with the wheel I employ a spring 29.

A circuit 30, having batteries 31 and a spark-coil 32 included therein, is attached to the igniting-case 5 and the plate 10.

In the drawings the device is shown at the indicator as set for ignition at half-stroke,

and at each reciprocation of the rod 19 toward the rear the pawl 28 engages with the toothed wheel 8, rotating it one-quarter revolution or one tooth and likewise rotating the inner toothed wheel 7. This inner toothed or circuit-breaking wheel being in contact with the spring-actuated pawl 12, which are both in circuit, causes a spark to be produced between the teeth of the wheel and pawl as the latter leaves each tooth, thereby causing the explosion at the point indicated by the hand 24, which in this case, as previously stated, is half-stroke. When it is desired to change the point of ignition to occur at any point of the stroke in either direction, the set-screw 22 is released and the nut 23 rotated, thus adjusting the position of the plate 21, which carries the rod 27, thereby causing the pawl 28 to engage the toothed wheel 8 sooner or later, as the case may be.

A slight variation in the construction of the reciprocating part of the device is shown at Fig. 6, in which 33 is the reciprocating shaft, 34 the bracket, 35 the hand, and 36 the graduated plate. In this form the rod 37, carrying the pawl 38, is threadably secured within the end of the reciprocating shaft.

The tension of the spring-actuated shaft 11 or pawl 12 may be increased or diminished by the adjustment of the collar 14.

By means of this device the sparking-terminals are kept clean, thus insuring good contact at all times, and thereby giving positive ignition. Besides it may be readily seen at what point of the stroke the ignition occurs, as well as being capable of adjustment to any desired point of the stroke.

It is to be understood that the toothed wheel may have greater or less number of teeth, as desired, or, as shown in Fig. 8, that the space between the teeth 108 may be filled with proper insulation 109 to form a true periphery and make and break the circuit as it rotates or advances beneath the spring-pressure pawl 110 or contact-plate, as well as the substitution of equivalent parts for such detail parts as enter into the construction of the device, without departing from the scope of my invention.

Having thus fully shown and described means of accomplishing my objects, what I claim as new, and desire to secure by Letters Patent, is—

1. In an explosive-engine, the combination with the explosion-chamber thereof, a shaft reciprocated by said engine, and sparking devices within said chamber, of a rod reciprocated by said shaft and adjustable relatively thereto, said rod having means by which it actuates the sparking devices, and an indicating mechanism, comprising a relatively adjustable graduated plate and pointer connected with said rod and shaft so as to be adjusted simultaneously with the relative adjustment thereof, substantially as shown and described.

2. In an explosive-engine, the combination with the explosion-chamber thereof, a shaft

reciprocated by said engine and a sparking device within said chamber, embracing a circuit-breaking wheel and a contact-piece, of a rod adjustably connected with said shaft and reciprocated thereby, a plate fixedly connected with said rod and adjusted thereby relatively to said shaft, said plate having indicating-graduations thereon, and a pointer pivoted between its ends to said plate and having one end connected with said shaft.

3. In an explosive-engine, the combination with the explosion-chamber thereof, a shaft reciprocated by said engine, a sparking device with said chamber embracing a circuit-breaking wheel and a contact-piece to engage said wheel, and a ratchet-wheel connected with said circuit-breaking wheel, of a rod adjustable relatively to said shaft and reciprocated thereby, a pawl carried by one end of said rod and engaged with said ratchet-wheel, a plate fixedly connected with the other end of said rod and having indicating-graduations, said plate and rod being simultaneously adjusted relatively to said shaft, a bracket carried by said shaft, and a pointer pivoted to said plate between its ends and having one end loosely connected with said bracket.

4. In an explosive-engine, the combination with the explosion-chamber thereof, a shaft reciprocated by said engine, and a sparking mechanism within said explosion-chamber, of a connection between said shaft and sparking mechanism, comprising a plate, an adjusting-nut for said plate threaded upon the end of said shaft, a rod carried by said plate and means actuated by said rod for actuating said sparking mechanism, and an indicating means comprising graduations on said plate, a bracket fixed on said shaft, and a pointer pivoted to said plate near one end and having its adjacent extremity loosely connected with said bracket.

5. In an explosive-engine, the combination with the explosion-chamber thereof, a shaft reciprocated by said engine, and a sparking mechanism within said chamber embracing a circuit-breaking wheel and a spring-pressure plate or contact-piece engaging said wheel, of adjustable means for actuating said sparking mechanism from said shaft, comprising a plate adjustably fixed on said shaft, a rod carried by said plate, a pawl carried by said rod and a ratchet engaged by said pawl and connected with said circuit-breaking wheel, and means for indicating the point at which the parts are adjusted to produce a spark, comprising graduations on said plate, a bracket carried by said shaft, and a pointer pivoted near one end to said plate and having an extremity loosely connected with said bracket.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

ANDREW MCTIGHE.

Witnesses:

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