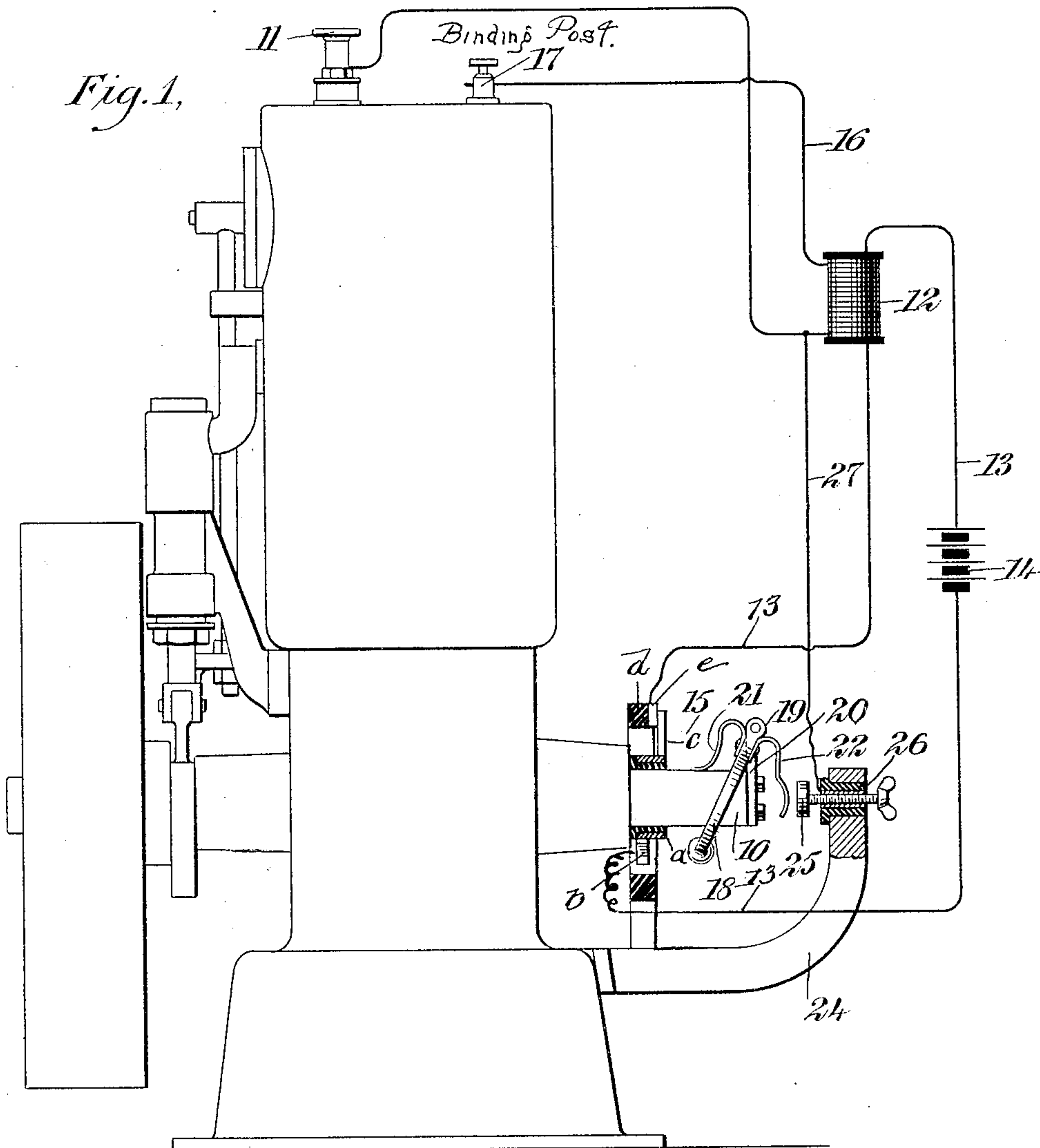
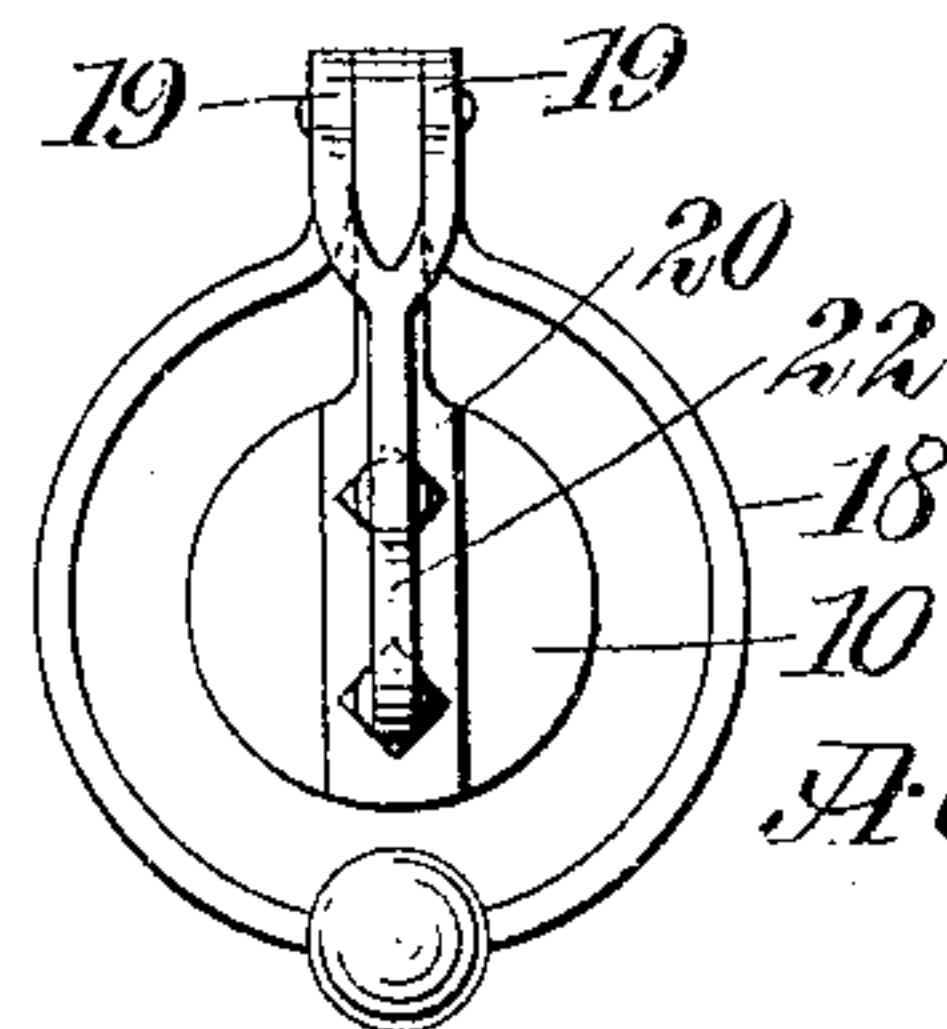


A. N. HATHERELL.  
INTERNAL COMBUSTION ENGINE REGULATOR.

APPLICATION FILED JUNE 21, 1904.



*Fig. 2.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ALBERT NEWTON HATHERELL, OF APPLETON, WISCONSIN.

## INTERNAL-COMBUSTION-ENGINE REGULATOR.

No. 803,339.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed June 21, 1904. Serial No. 213,444.

*To all whom it may concern:*

Be it known that I, ALBERT NEWTON HATHERELL, a citizen of the United States, and a resident of Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and Improved Internal-Combustion-Engine Regulator, of which the following is a full, clear, and exact description.

The invention relates to a means for automatically regulating the speed of internal-combustion engines.

According to the form of the invention here illustrated the regulator consists principally in a swinging contact member actuated by centrifugal force through the revolution imparted to the regulating member in time with the operation of the engine, said contact member being combined with conducting devices in such a manner as to short-circuit the electrical igniting apparatus, thus stopping the ignition of the charge of fuel when the speed of the engine becomes too great.

Reference is had to the accompanying drawings, illustrating, as an example, one manner of practicing my invention, in which like characters of reference indicate like parts in both of the views, and in which—

Figure 1 is a side view of an engine, showing the regulator applied thereto; and Fig. 2 is an end view of the centrifugally-operating contact device.

In Fig. 1, 10 indicates the crank-shaft of the engine, and 11 the spark-plug, which projects into the engine-cylinder to ignite the charge. 12 indicates the induction-coil of the igniting apparatus, 13 the primary circuit, including a source of energy 14 and a commutator 15 of any suitable form, and 16 indicates the secondary circuit, connected to the spark-plug 11 and grounded on the engine, as indicated at 17. The commutator is intended simply to make and break the primary circuit 13, unaffected by the operation of my improved regulator, which affects the secondary circuit only. Obviously the form of commutator employed is immaterial. As illustrated in the drawings, however, it comprises a conducting-band *a*, attached to the engine-shaft 10 and engaged by a stationary spring tongue or brush *b* in connection with one pole of the primary circuit 13. The brush *b* is independently supported in any desired manner—for example, by an insulating-ring *d*. The conducting-band *a* is insulated from the shaft 10 and carries a conducting-arm *c*, which runs around the insulating-ring *d*.

Said ring is held stationary on the frame or base of the engine. The insulating-ring *d* carries a conducting-segment *e* in connection with the other pole of the primary circuit 13. It will be seen, therefore, that as the parts *a* and *c* turn with the shaft 10 the arm *c* periodically contacts with the segment *e*, and the circuit 13 is closed through the parts *e*, *c*, *a*, and *b*. The circuit is broken the instant that the arm *c* runs off the segment *e*. This action goes on regularly and is not interrupted by the short-circuiting devices, which will be described hereinafter.

The centrifugal contact device comprises a weighted ring-like member 18, having projecting lugs 19, pivoted to an arm 20, projecting transversely from the crank-shaft 10. The ring 18 has a spring-finger 21, attached thereto to limit its outward swinging movement and to hold the ring yieldingly in the diagonal position with respect to the crank-shaft shown in Fig. 1. Attached to the opposite side of the ring 18 of the contact device is a contact-finger 22. Adjustably mounted in any suitable manner—for example, by a bracket 24—is a contact member (here shown as a screw 25) insulated by a sleeve 26 or its equivalent and adapted to be engaged by the contact-finger 22. Connected with the screw 25 and leading into the secondary circuit 16 of the sparking apparatus is a conductor 27.

In the normal operation of the engine the spring 21 keeps the body portion or ring of the contact device in the inwardly-inclined or diagonal position shown in Fig. 1; but when the speed of rotation of the shaft 10 becomes greater than that to which the regulator is set the centrifugal force exerted on the body member 18 will cause the spring 21 to give and the contact-finger 22 to engage the screw 25. The secondary circuit 16 of the sparking apparatus will then be short-circuited, and no spark will be developed at the plug 11. This will fail to ignite the engine charge, and consequently reduce its speed. By the adjustment of the contact-screw 25 the speed of the engine may be controlled as desired. When the screw is moved outward, the arm 22 must have a longer movement before short-circuiting, and therefore a higher speed is allowed the engine. Upon moving the screw inward a reversal of the above-described result takes place.

Various changes in the form, proportions, and minor details of my invention may be re-



sorted to at will without departing from the spirit and scope thereof. Hence I consider myself entitled to all such variations as may lie within the terms of my claims.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An internal-combustion-engine regulator, comprising the combination with an electrical igniting system, of means for establishing a short circuit therein, and including a centrifugally-operated member connected to turn in synchronism with the engine and adapted to be thrown into action by the centrifugal force.

15 2. An internal-combustion-engine regulator, comprising the combination with an engine having a rotary shaft and an electrical igniting apparatus, of means for establishing a short circuit, and including a centrifugally-operated contact member pivotally mounted on the rotating shaft.

3. An internal-combustion-engine regulator, comprising the combination with an engine having a rotary shaft and an electrical igniting apparatus, of means for establishing a short circuit, including a centrifugally-operated contact member pivotally mounted on the rotating shaft, and means for yieldingly holding the contact member in inactive position.

4. An internal-combustion-engine regulator, comprising the combination with an engine having a rotary shaft and an electrical igniting apparatus, of means for establishing a short circuit, including a centrifugally-operated contact member pivotally mounted on the rotating shaft, and a spring connected to said member and bearing on the shaft yieldingly to hold the member in inactive position.

5. An internal-combustion-engine regulator, comprising the combination with an electrical igniting apparatus and a shaft rotating in synchronism with the engine, of means for establishing a short circuit in the electrical igniting apparatus, and including a centrifugally-operated ring pivotally mounted on and encircling the shaft, a contact mem-

ber on the ring and means for yieldingly holding the ring in inactive position.

6. An internal-combustion-engine regulator, comprising the combination with a rotary shaft driven in synchronism with the engine and an electrical igniting apparatus, of means for establishing a short circuit in the igniting apparatus, and comprising a centrifugally-operated ring pivotally mounted on and inclosing the shaft, a contact member carried thereby, and a spring connected to the ring and bearing on the shaft yieldingly to hold the ring in inactive position.

7. An internal-combustion-engine regulator, comprising the combination with an engine having an electrical igniting apparatus, of means for establishing a short circuit, including two contact members, one of which is centrifugally operated and the other of which is adjustable from and toward the first.

8. An internal-combustion-engine regulator, comprising the combination with the engine having an electrical igniting apparatus, of means for establishing a short circuit in the igniting apparatus, and including a centrifugally-operated member connected to turn in synchronism with the engine, a contact-finger carried thereby, and a contact-screw adjustable from and toward the contact-finger.

9. An internal-combustion-engine regulator, comprising the combination with an engine having a rotary shaft and an electrical igniting apparatus, of means for establishing a short circuit in the igniting apparatus, and comprising a ring pivoted on and encircling the rotary shaft, a spring yieldingly holding the ring in inactive position, a contact-finger carried by the ring and a contact member adjustable toward and from the contact member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT NEWTON HATHERELL.

Witnesses:

FRED E. HANIMAN,  
REUBEN W. LEE.