No. 666,439. Patented Jan. 22, 1901.

# G. L. REENSTIERNA.

## SPARKING IGNITER FOR EXPLOSIVE ENGINES.

(Application filed Mar. 3, 1900.)

(No Model.)

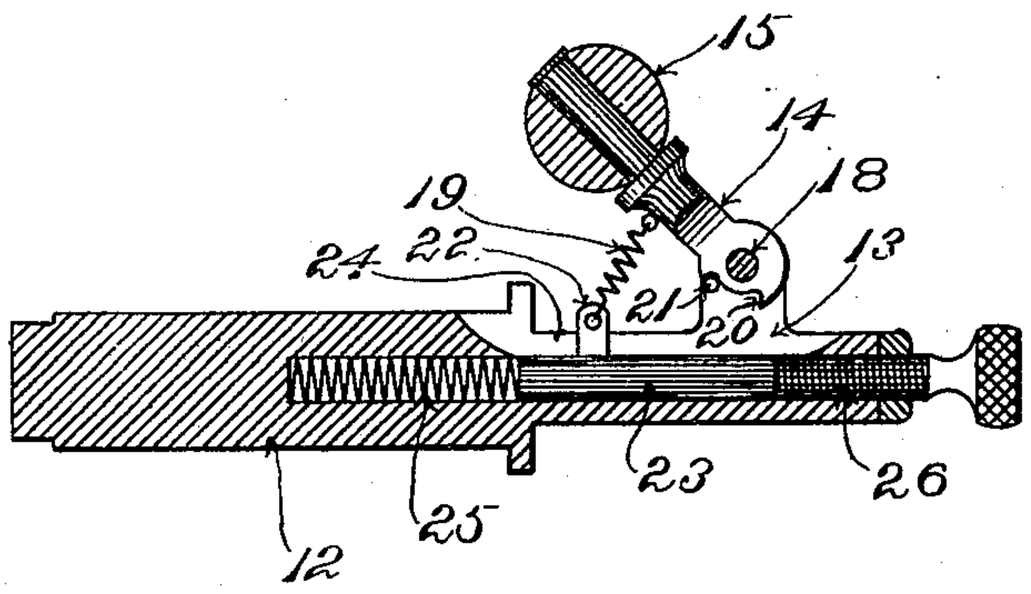


Fig. 2.

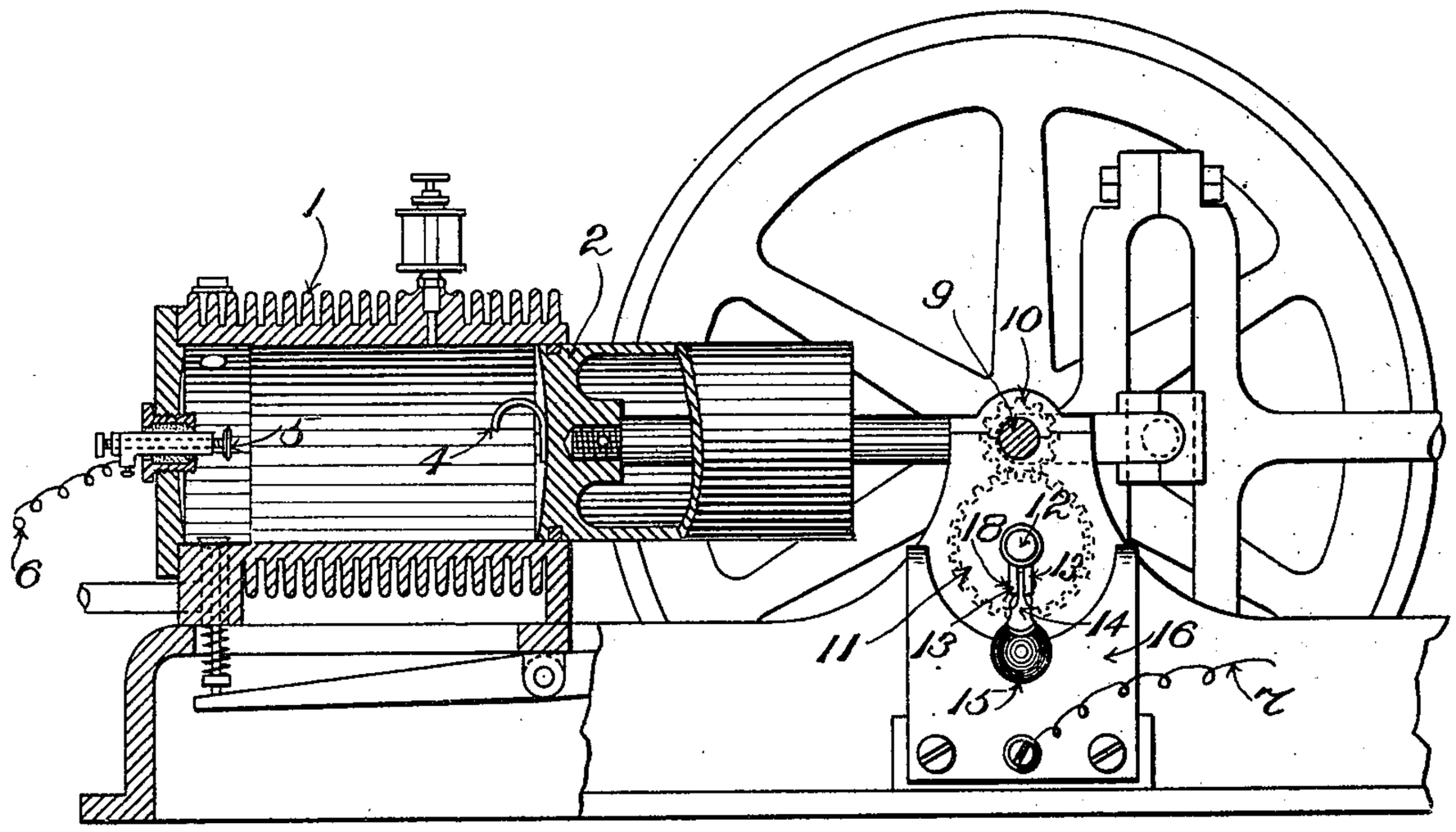


Fig. 1.

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# UNITED STATES PATENT OFFICE.

GUSTAF L. REENSTIERNA, OF WINCHESTER, MASSACHUSETTS.

## SPARKING IGNITER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 666,439, dated January 22, 1901.

Application filed March 3, 1900. Serial No. 7,145. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAF L. REENSTIERNA, a citizen of the United States, residing at Winchester, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Explosive Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

In gasolene-engines and other engines of kindred character which are driven by successive explosions in the cylinder the speed of the engine varies with the frequency of the explosions. The explosions are usually occasioned by an electric spark, which is made by the making and breaking of an electrical contact.

The object of my invention is to provide an automatic governor which shall break the circuit when the speed attains a certain degree, thereby preventing the explosions until the speed becomes reduced to the predetermined limit.

My invention will now be fully described by reference to the accompanying drawings, and the novel features thereof will be particularly pointed out in the claims at the close of this specification.

In the drawings, Figure 1 is a side elevation of a portion of an engine embodying my invention, the cylinder being broken away to show the electrical contacts. Fig. 2 is a central lengthwise section showing the governor-shaft and governor detached.

1 represents the cylinder; 2, the piston; 4, the movable contact-piece on the piston, and 5 the fixed contact in the cylinder-head. The wires 6 and 7, broken away, form part of the electrical circuit. The particular form of construction of the elements thus far described is not, however, material to my present invention and need not be further described.

On the crank-shaft 9 is a pinion 10, which meshes with a gear 11, fixed to the shaft 12. The pinion 10 makes two revolutions to one of the gear 11. Pivoted to the shaft 12, as between ears 13, is the arm 14, carrying the governor-ball 15.

The wire 7 is connected to the conducting-plate 16, which forms a part of the electric circuit. The governor-ball 15, which is also of conducting material and forms a part of the circuit, is so adjusted with relation to the plate 16 that at each rotation of the shaft 12 and governor-ball 15 the ball will wipe against the plate 16 and make electrical connection, except when thrown out of the plane of contact, as hereinafter described. The form and adjustment of plate 16 are such that the ball 15 will be in contact during one-half of each revolution of shaft 12 and gear 11—that is, it will be in contact during one entire revolution of crank-shaft 9 and then out of contact during the next revolution of shaft 9. When, therefore, the piston is thrown forward and makes contact between the contact-pieces 4 and 5 within the cylinder, and also when the contacts 4 and 5 break away from each other, if the circuit is complete between ball 15 and plate 16 there will be a spark in the cylinder, which will occasion the explosion. The arm 14 being pivoted, however, on pin 18 will fly out from the plate 16 under the centrifugal force when the speed exceeds a certain rate, so that when the governor swings around it will not contact with the plate and there will be no explosion. The speed will thus gradually decrease until the governor drops again into the place where it can make contact with the plate 16, when the explosions will again occur as before.

The spring 19 facilitates the return of the governor to its normal plane when the speed is reduced and also regulates the centrifugal movement of the governor. A shoulder 20 engages with a pin 21 to limit the centrifugal movement of the governor.

Spring 19 is connected to an ear 22, which projects from the slide-rod 23 through slot 24 in shaft 12. Slide-rod 23 is seated on spring 25 within a longitudinal bore that is formed in shaft 12 for the reception of the said spring. Against the other end of slide-rod 23 presses the end of screw 26. By setting up screw 26 the slide-rod will be pushed in, thereby increasing the tension of spring 19 and holding the governor 15 in the plane to make contact with plate 16 until the engine attains a higher speed.

What I claim is—

1. In combination, in an explosive-engine, the igniting devices, a fixed contact in circuit with the igniting devices, a rotary shaft, a centrifugal governor also in circuit with the

igniting devices, carried by the said shaft, and constituting the moving contact, a spring connected with said governor, a rod movable longitudinally of the shaft, and having the other end of said spring attached thereto, and means to adjust said rod in the direction of the length of the shaft, substantially as described.

2. In combination, in an explosive-engine, the igniting devices, a fixed contact in circuit with the igniting devices, a rotary shaft having a longitudinal bore, a centrifugal governor also in circuit with the igniting devices, carried by the said shaft, and constituting the moving contact, a rod movable within the said bore, a spring between the rod and the governor, and the screw for adjusting said rod, substantially as described.

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

GUSTAF L. REENSTIERNA.

Witnesses:

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