

No. 881,953.

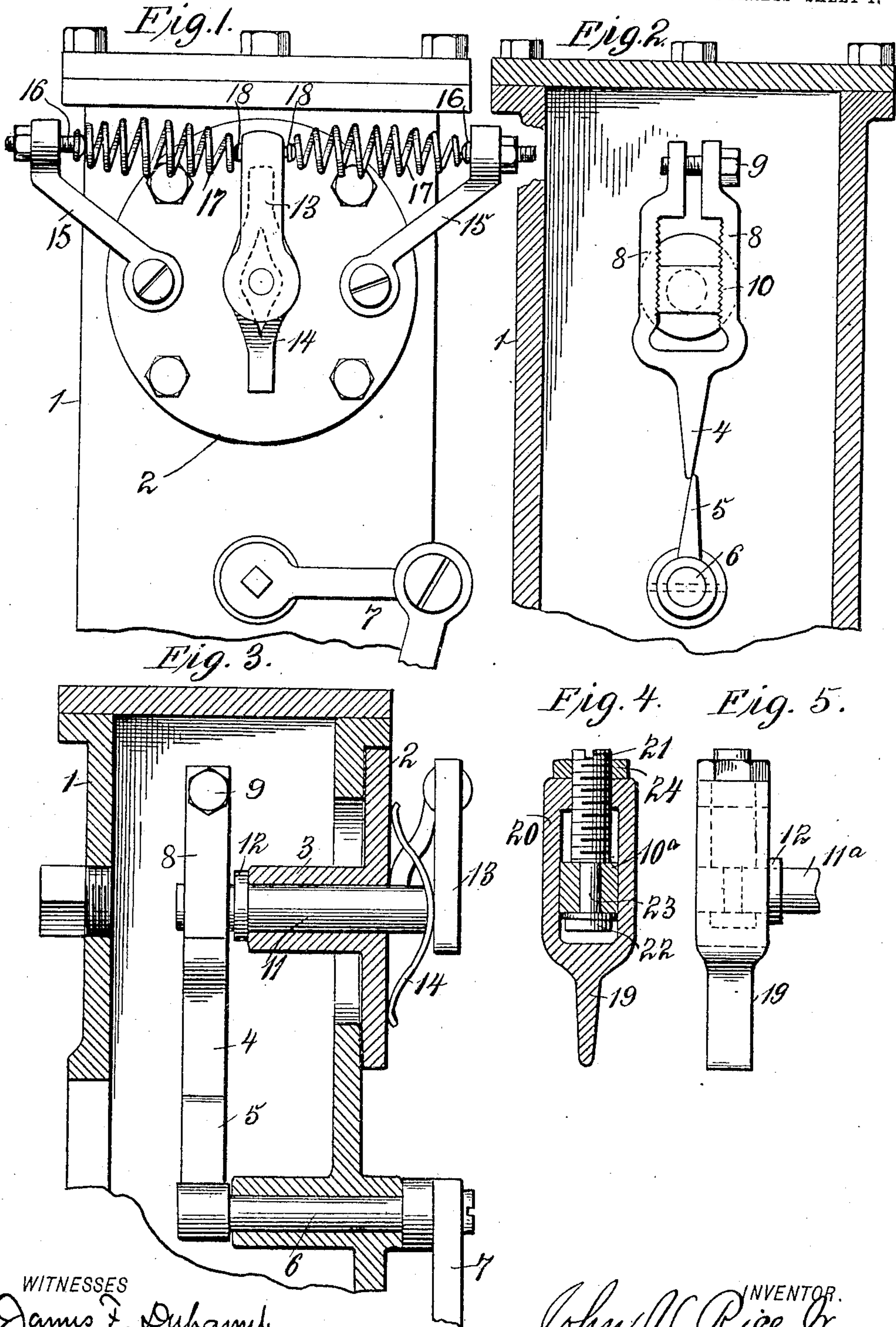
J. V. RICE, JR.

PATENTED MAR. 17, 1908.

IGNITING DEVICE FOR GAS ENGINES.

APPLICATION FILED JUNE 5, 1906.

2 SHEETS—SHEET 1.



WITNESSES
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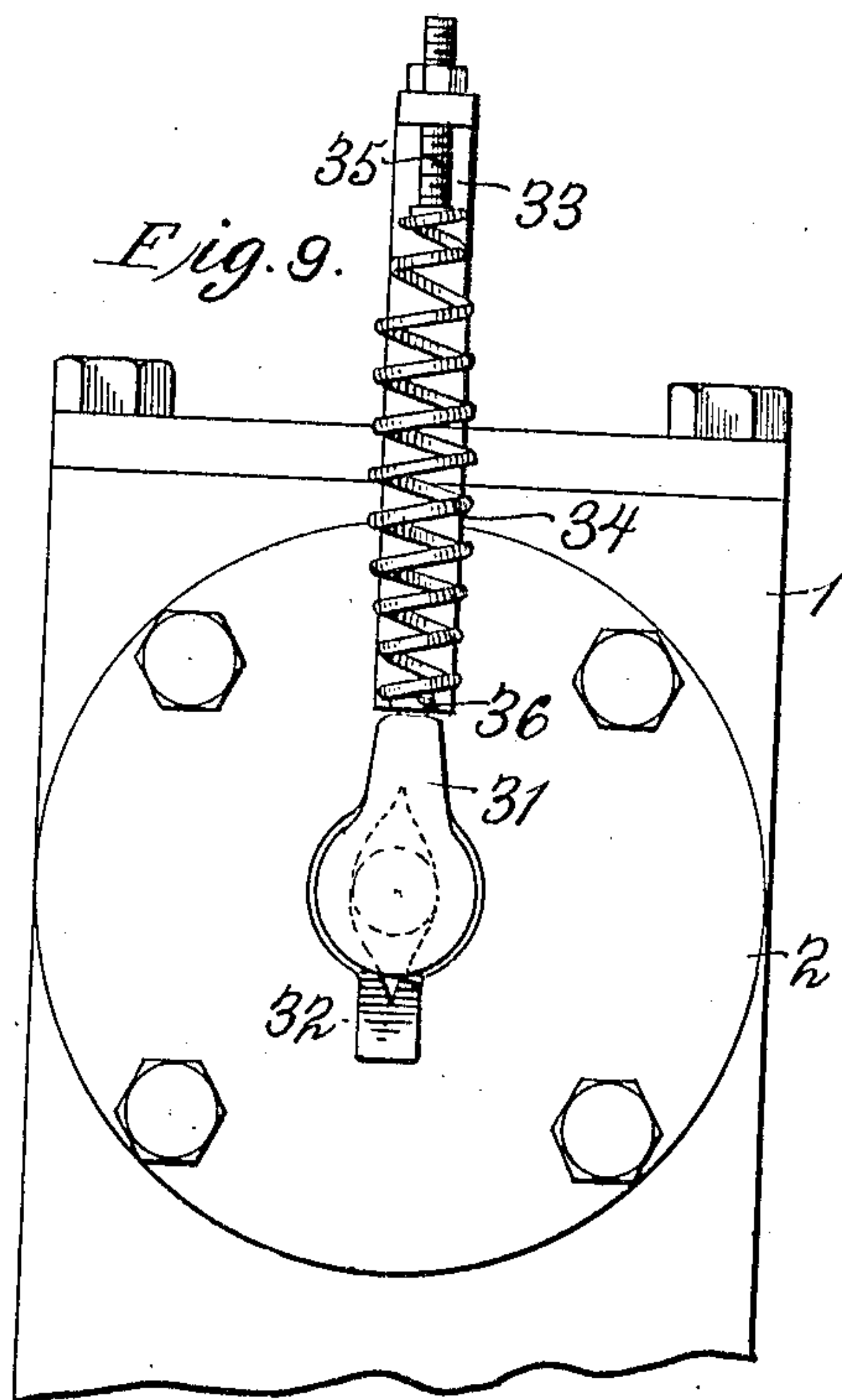
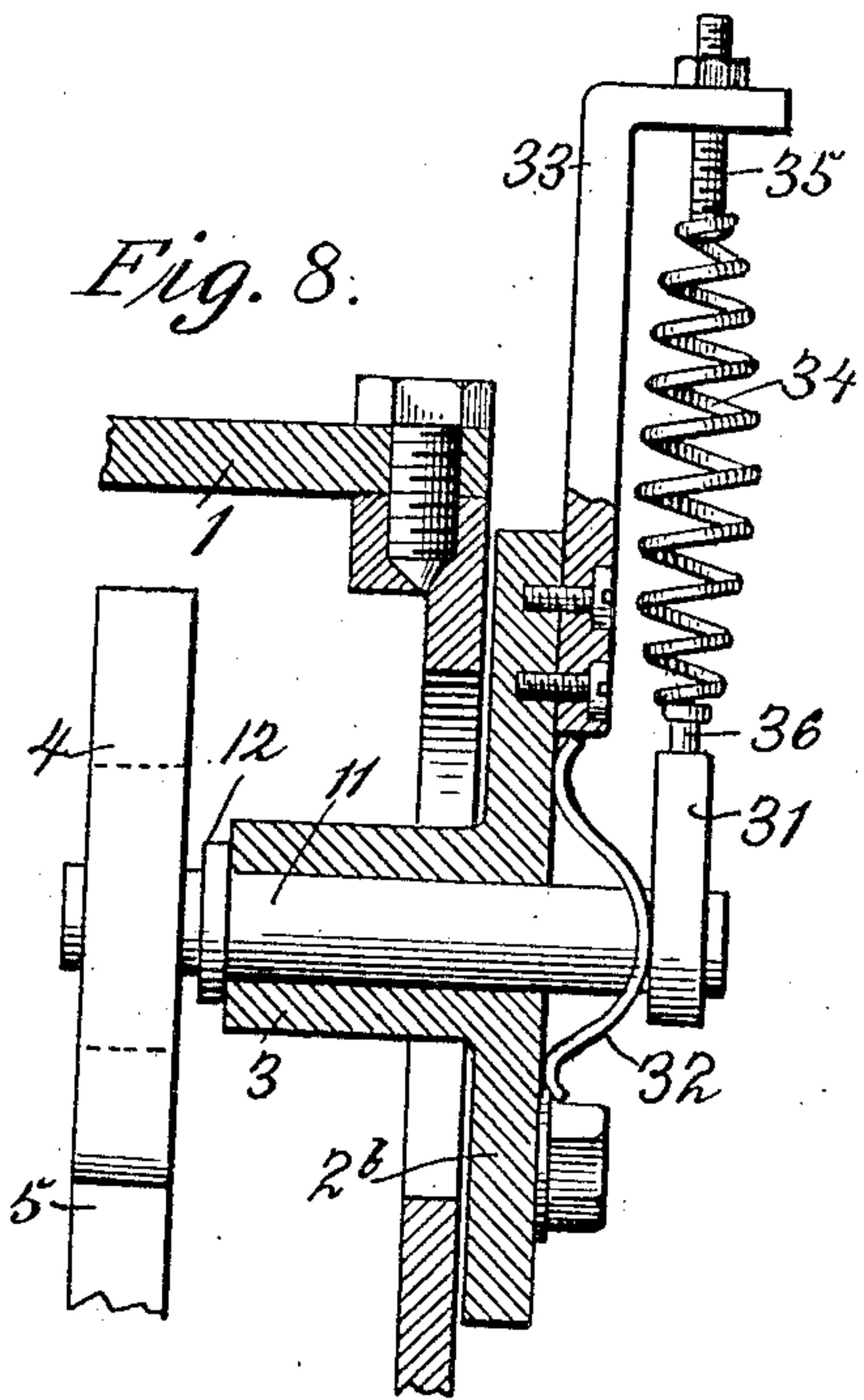
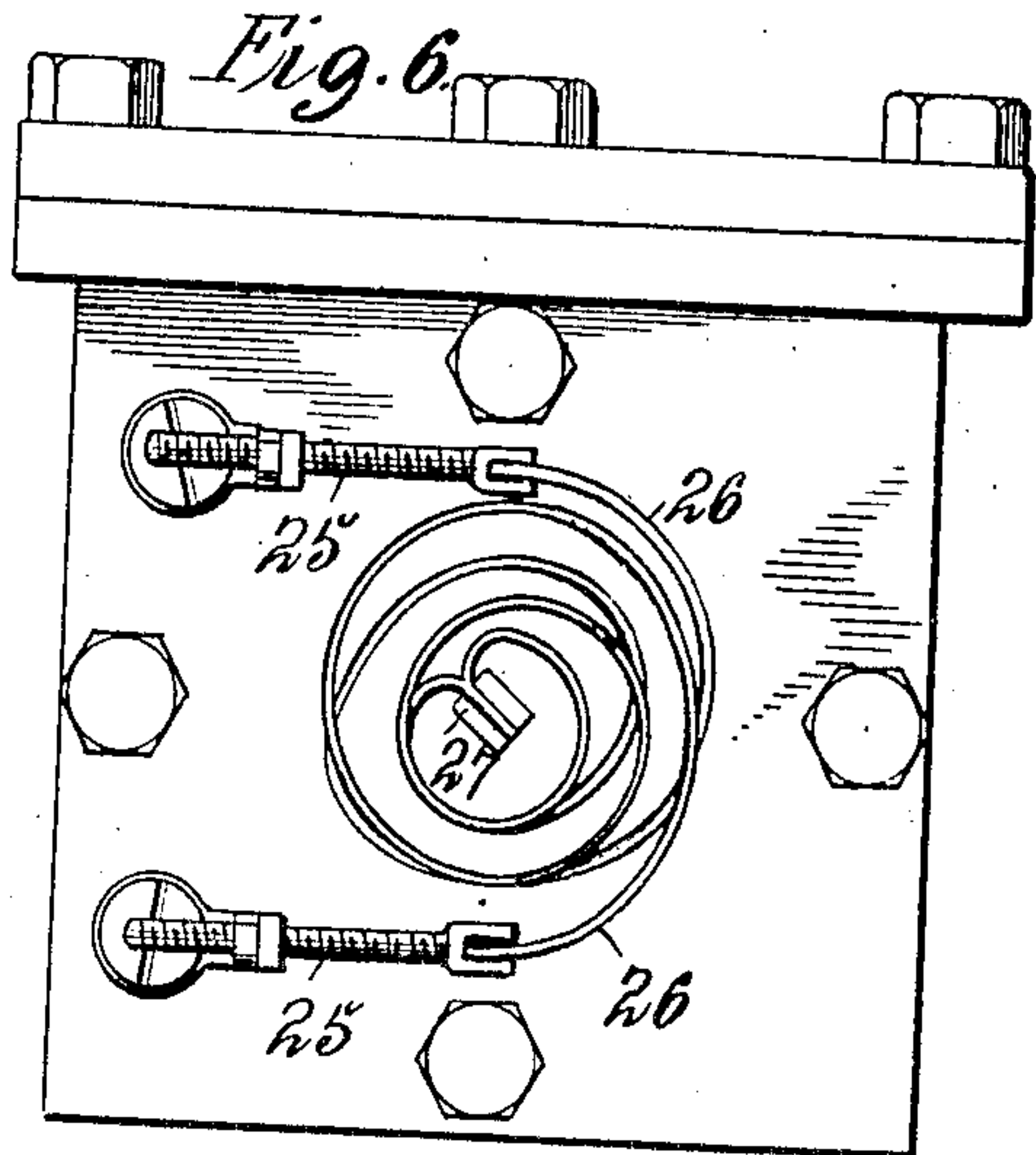
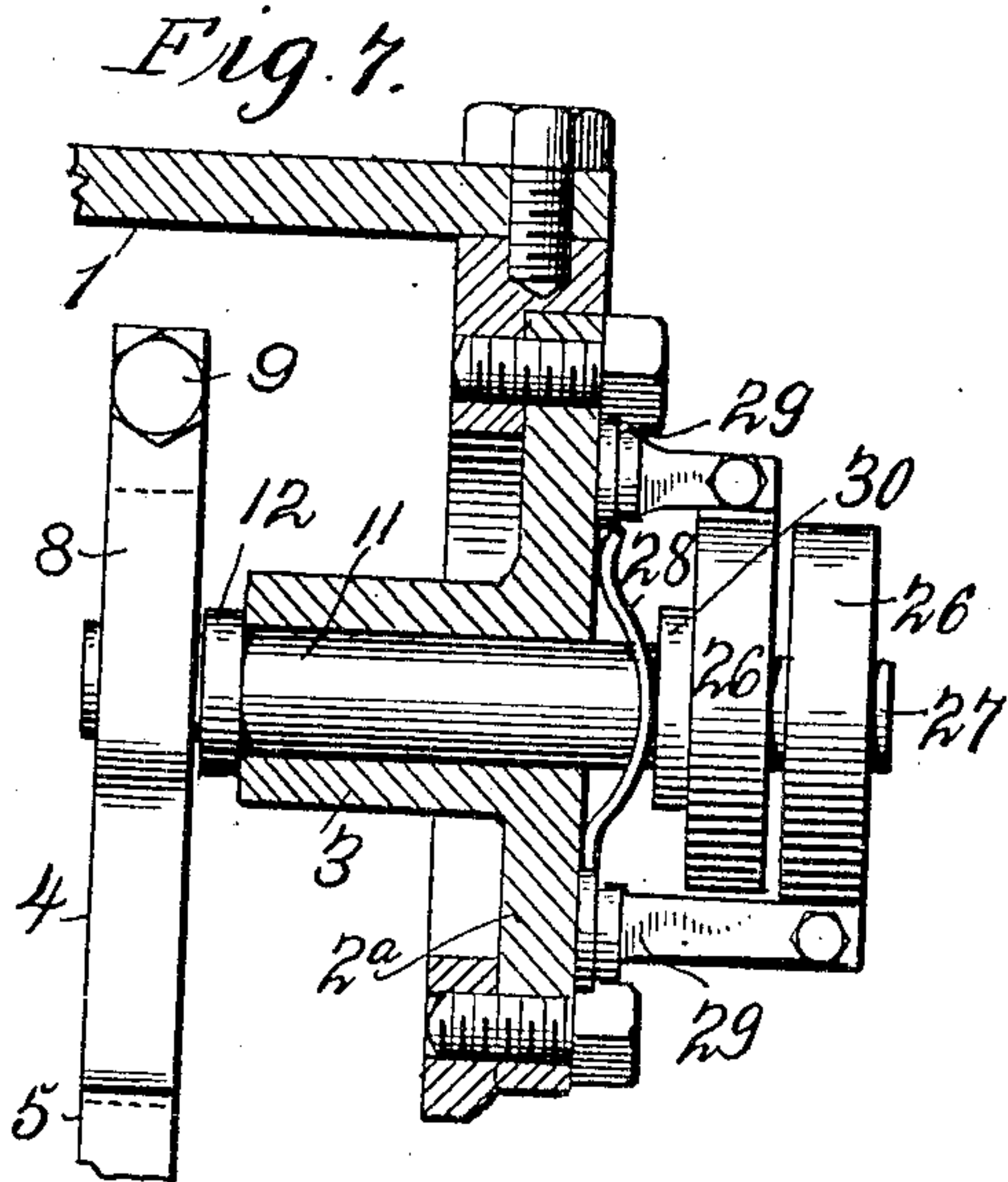
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2 SHEETS—SHEET 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN V. RICE, JR., OF BORDENTOWN, NEW JERSEY.

IGNITING DEVICE FOR GAS-ENGINES.

No. 881,953.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed June 5, 1906. Serial No. 320,230.

To all whom it may concern:

Be it known that I, JOHN V. RICE, Jr., a citizen of the United States of America, and a resident of Bordentown, county of Burlington, State of New Jersey, have invented certain new and useful Improvements in Igniting Devices for Gas-Engines, of which the following is a specification.

My present invention has reference to certain improvements in igniting devices for gas engines, the object in view being to secure the production of as efficient a spark as is possible with the least wear upon the parts that rub together in the making of such spark, and the invention therefore consists essentially in the construction, arrangement and combination of mechanical features, substantially as will be hereinafter more fully set forth and then specifically stated in the claims.

In the accompanying drawings illustrating my invention: Figure 1 is a side elevation of the outer surface of a portion of an explosion chamber or cylinder, showing the externally situated parts of my improved igniting device. Fig. 2 is a sectional view of the chamber showing the interiorly arranged electrodes and other accompanying features. Fig. 3 is a transverse sectional elevation taken at right angles to the section of Fig. 2. Fig. 4 is a sectional view of a modified form of the springing electrode. Fig. 5 is a side view of the same. Fig. 6 is an outer view of a cylinder showing the exterior parts of a modified form of my improved igniting device. Fig. 7 is a sectional view of the same. Fig. 8 is a sectional view representing a still other modified form of my improved igniting device. Fig. 9 is an elevational view of the same.

Like numerals of reference designate like parts throughout the different figures of the drawing.

1 denotes an explosion chamber or cylinder intended for use with a gas or other explosive engine. Within the cylinder are the two electrodes 4 and 5, whose ends are adapted to contact with each other in the production of the spark. The electrode 5 is the positively driven one, being secured rigidly to the shaft 6, which is supported in a bearing in the cylinder 1 as shown in Fig. 3, the outer end of said shaft 6 being connected to the link 7 which is operated from some moving part of the engine so that the electrode 5 has a steady and uniform vibration through a greater or less arc, as is cus-

tomary in gas engines. The electrode 4 has its tip in the path of the tip of the electrode 5 and is thus arranged to be struck by electrode 5 during its movements, the electrode 4 yielding when so struck and rubbing over the end of the electrode 5 in the production of the spark, the normal position of the electrode 4 being consequently as shown in Fig. 2.

The electrode 4 is preferably formed integrally with a rectangular frame having sides 8, 8, said frame being split at one end, in order to provide these sides 8, 8 and the ends of the sides being connected together by means of a set bolt or screw 9. The inner opposing edges of the sides 8, 8 are notched or serrated as shown, to engage the notched or serrated edges of a square section 10 of a pin 11, that is supported in a horizontal bearing 3, preferably formed as a boss on a removable plate 2, that is supported in an insulated manner in a lateral opening in the wall of cylinder 1. Of course I do not wish to be restricted to this manner of supporting the pin 11, but simply present it as one convenient means for properly holding said pin. The serrated sides 8 of the electrode frame enable said electrode to be adjusted for the purpose of compensating for wear. In effecting such adjustment the only thing necessary is to loosen the bolt 9, make the adjustment and then tighten the bolt once more. On the outer end of the pin 11 is a rigid vertical arm 13.

In order that there may be a tight joint at the inner end of the boss 3, a rigid collar 12 is placed on the pin 11, and a flat spring 14 is situated between the outer face of the plate 2 and the arm 13, for the purpose of drawing the pin outwardly, so as to hold the collar 12 tightly against the end of boss 3. On the outer face of plate 2 are rigidly secured the oppositely projecting inclined arms 15, 15, at the outer ends of which are the headed screws 16, provided with nuts and adjustable in the ends of the arms 15. The spiral springs 17 are connected to the bolts 16, and likewise to headed pins 18 in the upper end of the vertical arm 13. By adjusting the bolts 16 the tension of the spring 17 may be increased or diminished. It will thus be seen that by this arrangement of springs the electrode 4 is made elastic or yielding, and when vibrated to the right or to the left will immediately be brought back to its central position upon the

release of the agency which causes the vibration.

In Figs. 4 and 5 I have shown a modification of the yielding electrode. 19 denotes such electrode and it is made integral with a non-elastic rectangular frame 20, through the end of which passes an adjusting screw 21, on which is a nut 24 external to the frame 20. The inner end of the screw 21 has a head 22, and a diminished pin like section 23, that engages a section 10^a of the rotative pin 11^a. Thus it will be seen that by adjusting the screw 21, the electrode 19 can be changed in position sufficiently to compensate for any wear that may take place, due to the frequent rubbing together of the tips of the electrodes.

In the form of the invention represented in Figs. 6 and 7, a plate 2^a similar to the plate 2 is supported in an insulated manner in a lateral opening in the wall of the explosion chamber, said plate 2^a having a boss 3 and supporting the horizontal pin 11, which is provided with an internal collar 12, and also with an external collar 30, a spring 28 similar to spring 14 being located between the face of the plate 2^a and said collar 30 for the purpose of making a tight joint at the collar 12. On the outer face of plate 2^a are horizontally projecting screws or arms 29, 29 through which at right angles pass screw-threaded nut-provided pins 25, 25, to which are attached oppositely wound springs 26, 26, whose ends are rigidly fastened to the end 27 of the pin 11. These springs 26, 26 have the same function as the spring 17 of Fig. 1 in returning the yielding electrode 4 to its central position after sparking.

In the other modification of my invention represented by Figs. 8 and 9, a plate 2^b is supported in an insulated manner in the wall of the explosion chamber, said plate having a boss 3 receiving the pin 11, on the outer end of which pin is a vertical arm 31, between which and the face of the plate 2^b is the spring 32, which keeps a tight joint at the collar 12, and in the upper end of the arm 31 is a headed screw 36. A right angled standard 33 is secured to the plate 2^b or to some other suitable support, and in its horizontal

portion is arranged an adjustable screw 35. A coiled spring 34 is attached to the head of the screw 35 at one end, and at the other end to the head of the screw 36. This spring 34 acts to return the arm 31 to its vertical upright position and thus return the electrode 4 to its central position after sparking, said spring 34 being consequently for the same purpose in this modification, as the springs 17 are in the form of the invention shown in Fig. 1, and the springs 26 in that example illustrated in Figs. 6 and 7.

Having thus described my invention, what I claim as new, and desire to secure by Letters-Patent, is:—

1. In an igniting device for gas engines, the combination with the positively rocking electrode, of a yielding electrode, a frame with which it is formed integrally, said frame having elastic sides serrated on their inner opposing edges and provided with a clamping device for securing them together, and a support that is engaged by the serrated sides, substantially as described.

2. In an igniting device for gas engines, the combination with the rocking electrode, of a yielding electrode having an integral rectangular frame, said frame having elastic sides serrated on their edges, a supporting pin on which said frame is clamped, said pin being provided with an external arm, and spring devices attached to the opposite sides of said arms substantially as described.

3. In an igniting device for gas engines, the combination of rocking electrode, a yielding electrode having an integral rectangular frame, said frame having elastic sides serrated on their inner opposing edges, a supporting pin to which said frame is clamped, said pin having an external arm, a flat spring bearing against said arm, spiral springs attached to the upper end of said arm, and means for adjusting the tension of said spiral spring.

Signed at New York this 29th day of May 1906.

JOHN V. RICE, JR.

Witnesses:

JOHN H. HAZELTON,
C. B. SCHROEDER.