

No. 775,908.

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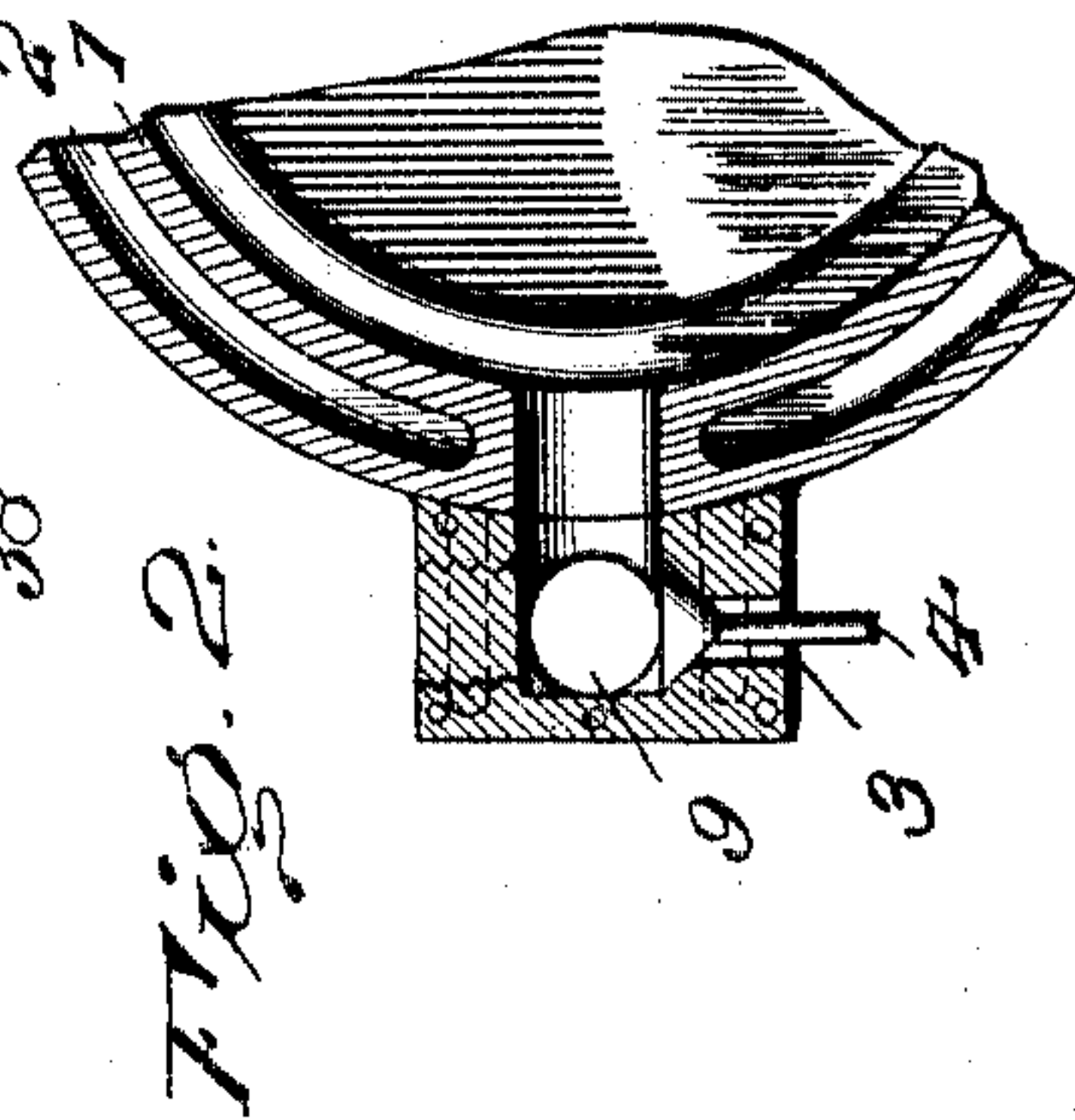
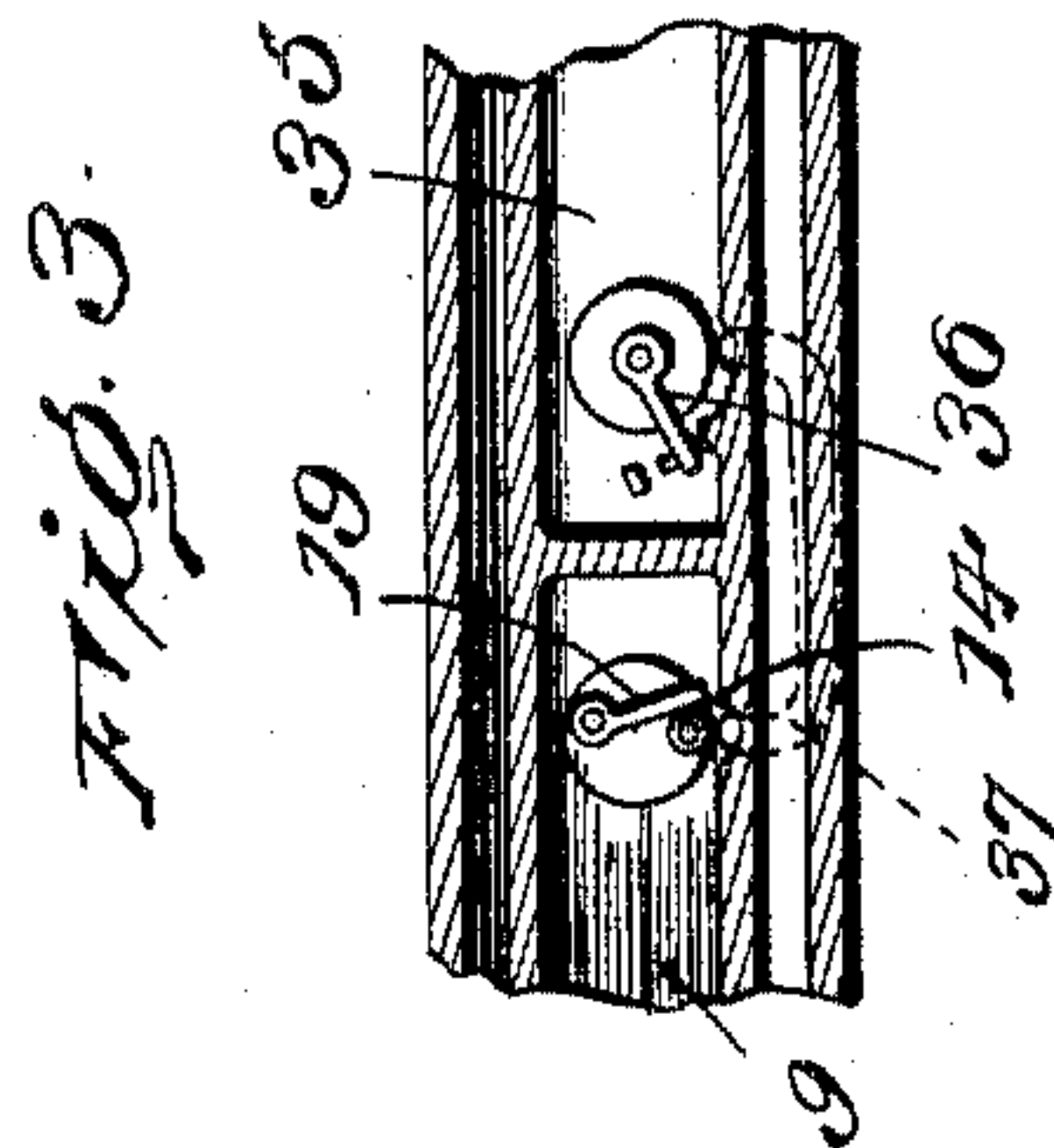
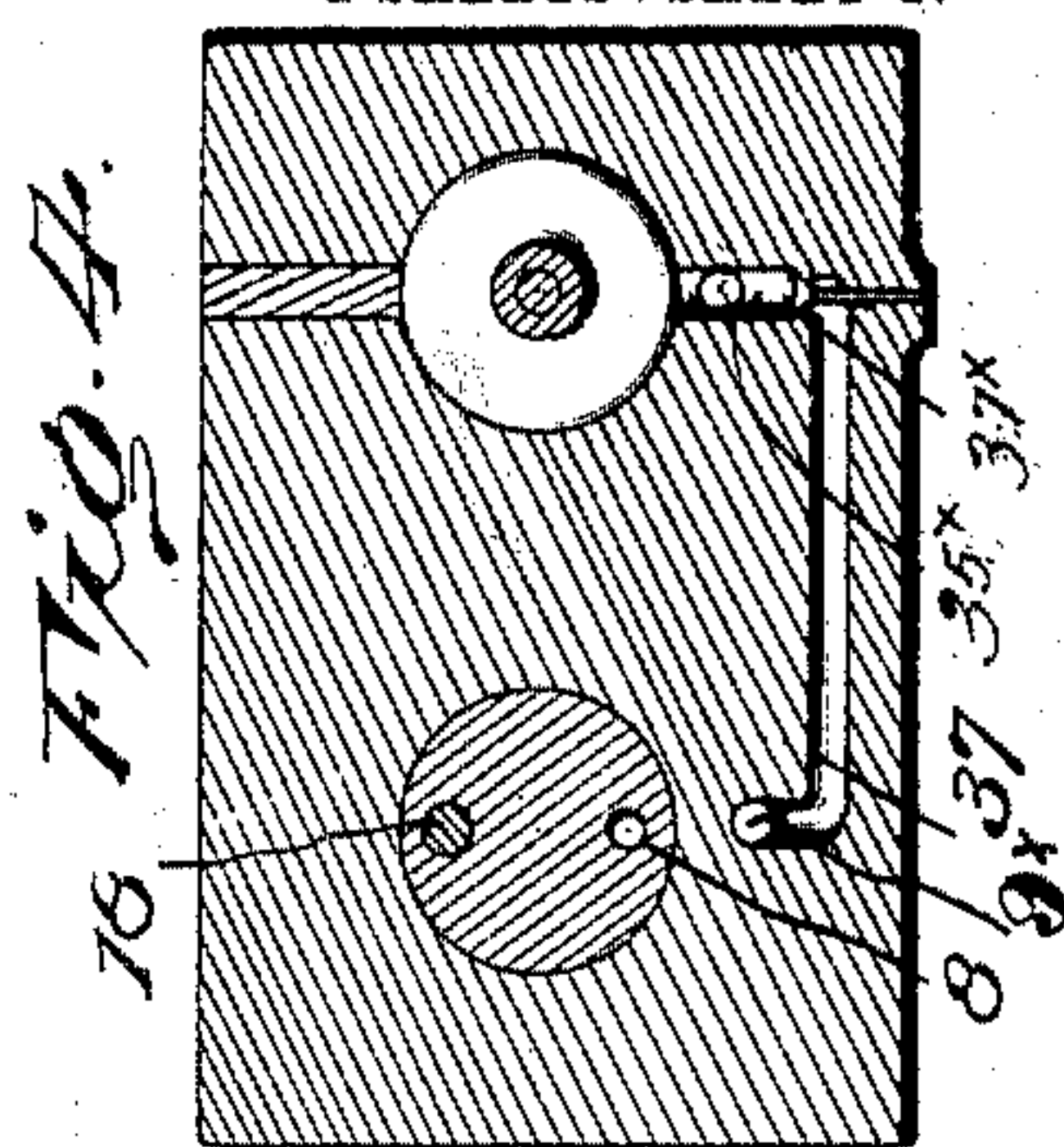
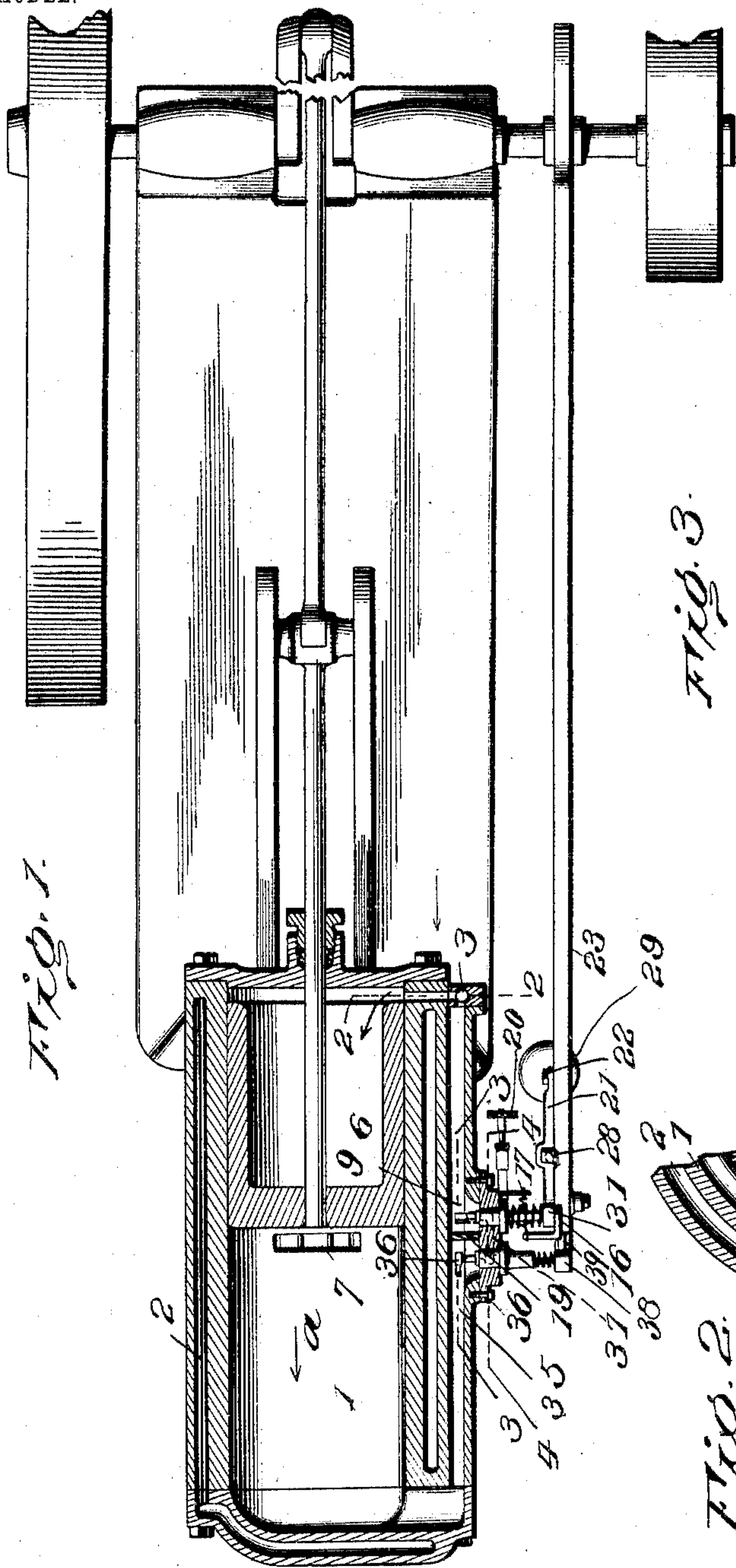
J. S. LOSCH.

SPEED REGULATOR FOR EXPLOSIVE ENGINES.

APPLICATION FILED MAY 28, 1902.

NO MODEL.

2 SHEETS-SHEET 1.



Witnesses

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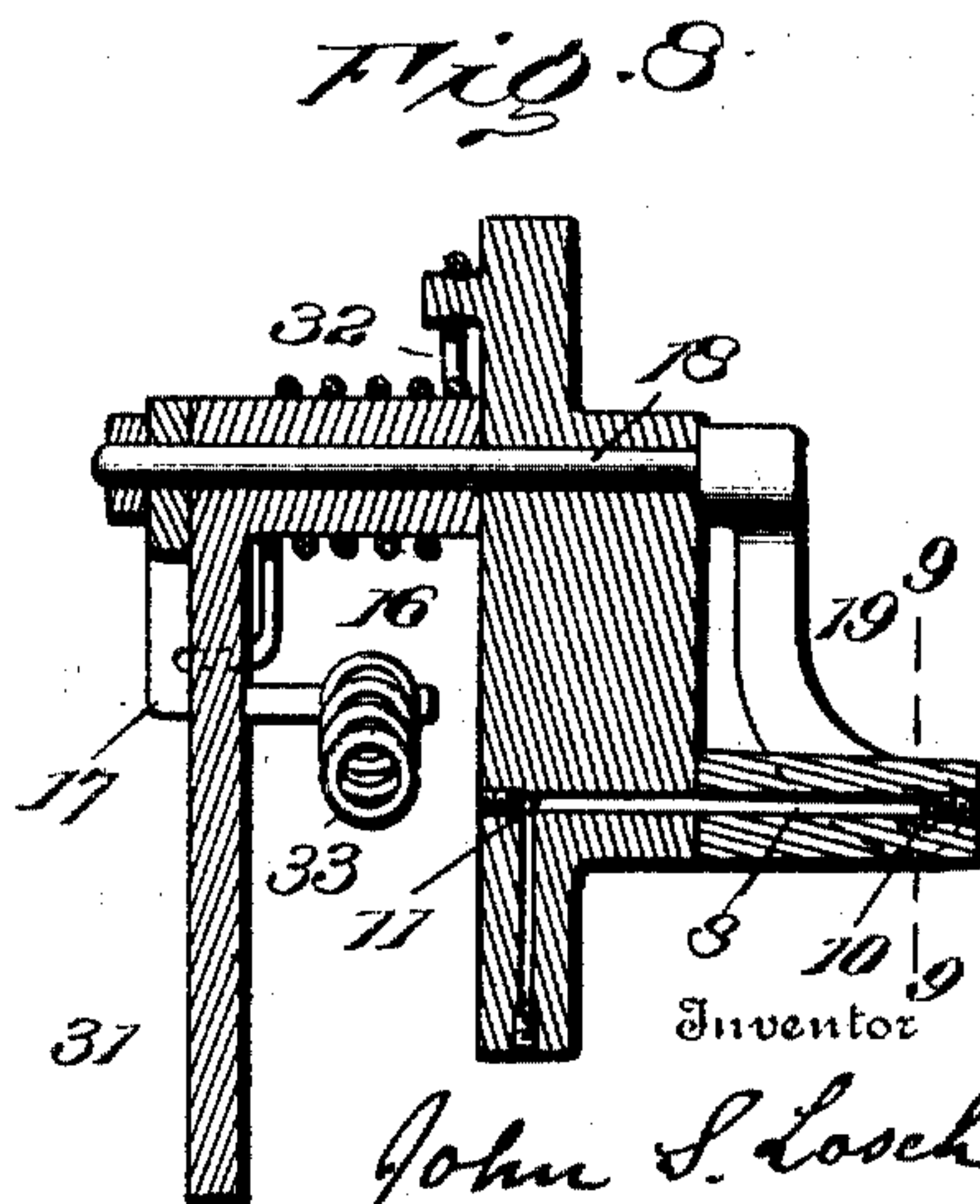
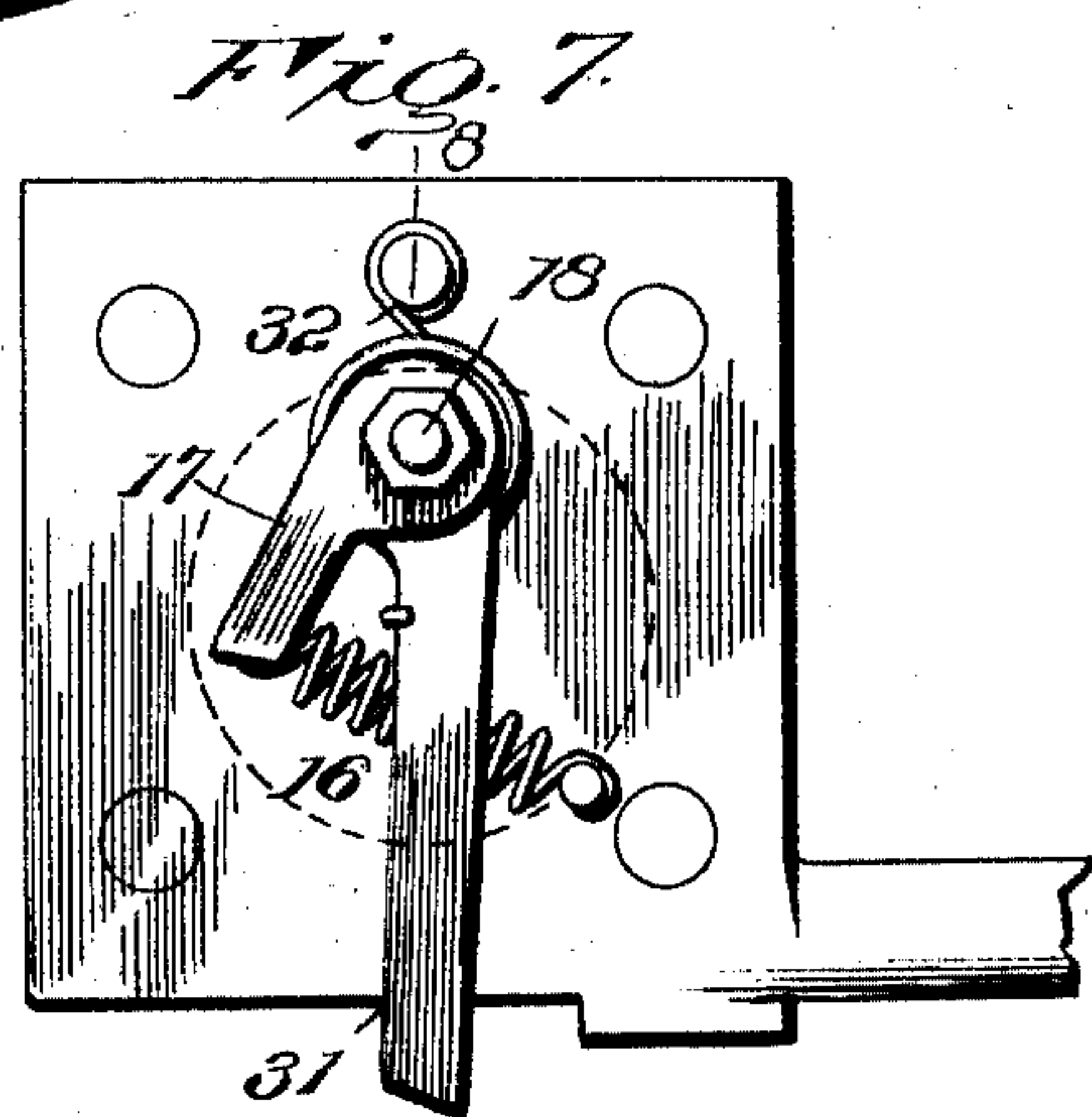
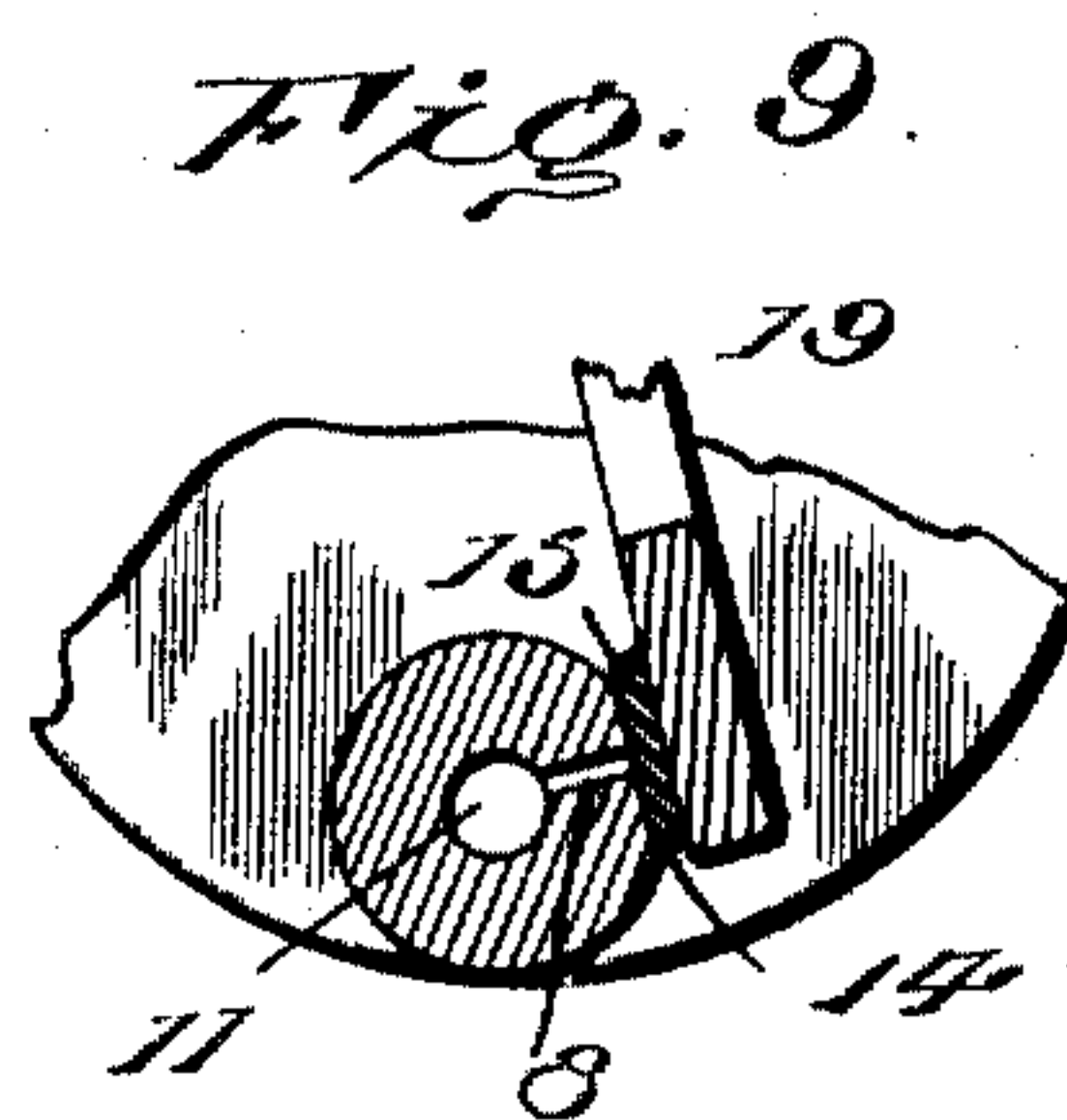
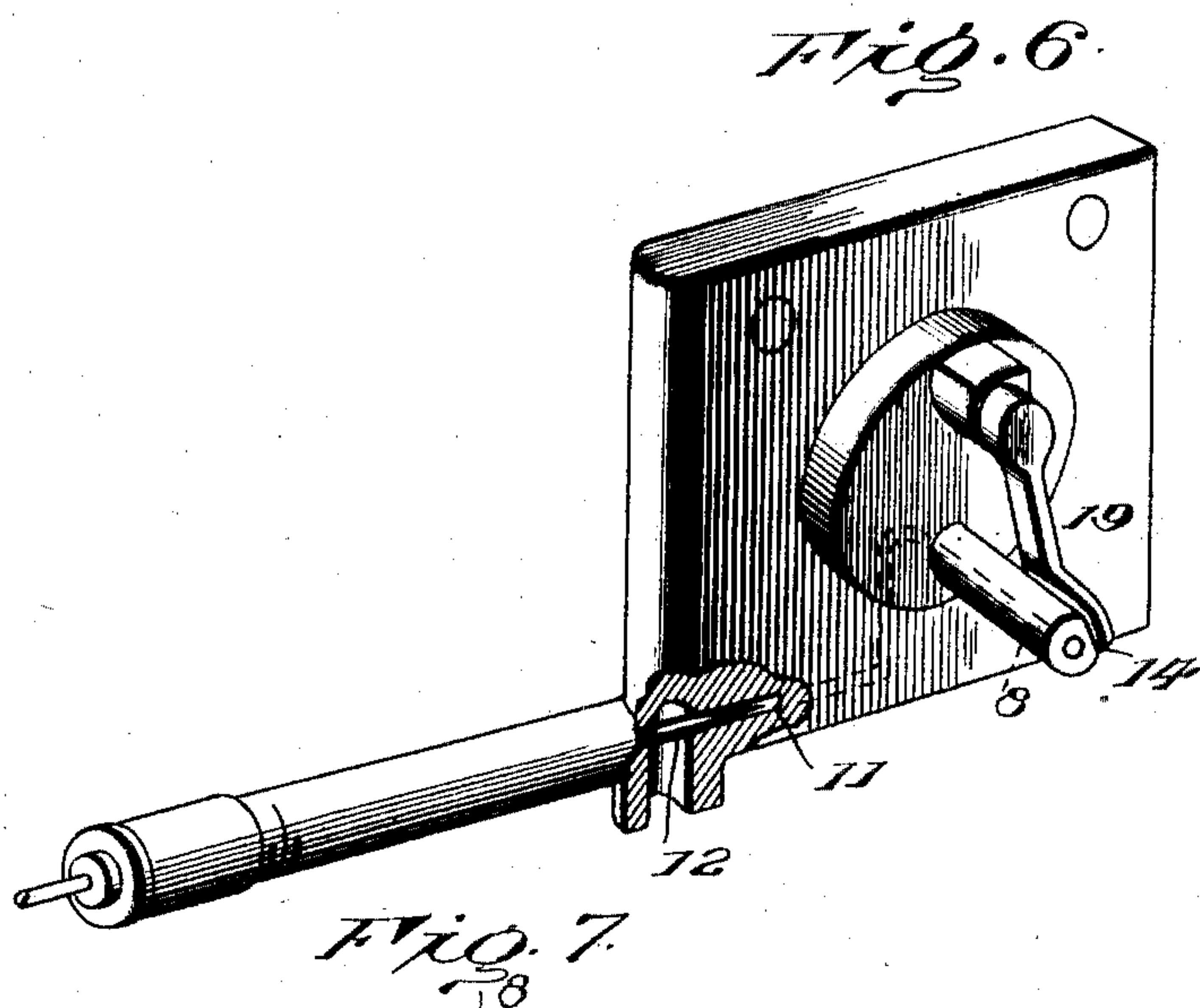
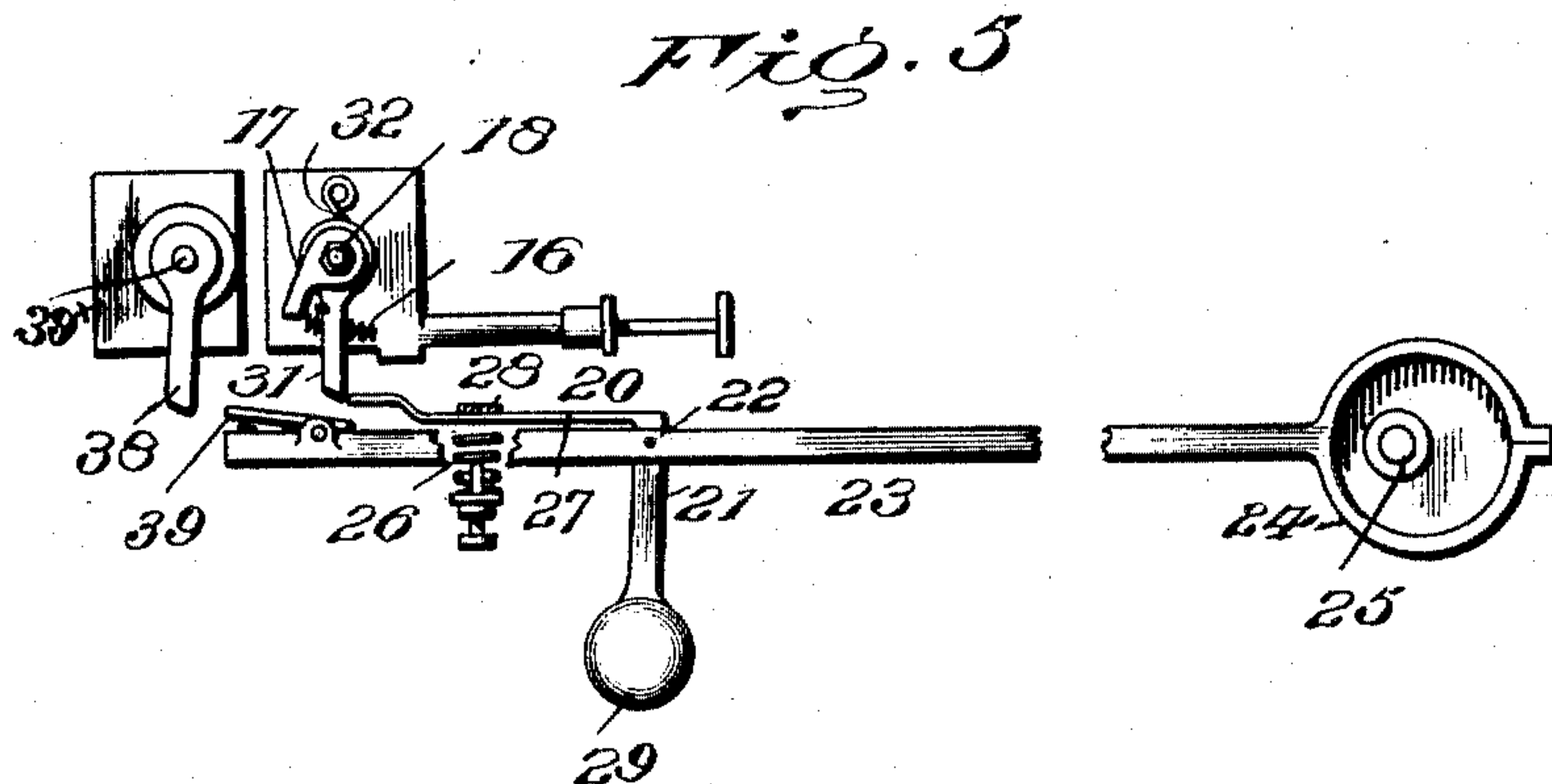
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SPEED REGULATOR FOR EXPLOSIVE ENGINES.

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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN S. LOSCH, OF POTTSVILLE, PENNSYLVANIA.

SPEED-REGULATOR FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 775,908, dated November 22, 1904.

Application filed May 28, 1902. Serial No. 109,283. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. LOSCH, a resident of Pottsville, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Speed-Regulators for Explosive-Engines; and I do hereby 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 pertains to make and use the same.

The invention relates to explosive-engines, and has for its object to simplify and cheapen their construction, increase their efficiency, prevent leakage, and insure uniform and regulable action of such engines.

The invention consists in the construction herein described and pointed out.

In the accompanying drawings, Figure 1 is a longitudinal section of the engine-cylinder, showing connected parts. Figs. 2, 3, and 4 are enlarged sections taken on the lines 2-2, 3-3, and 4-4, respectively, of Fig. 1. Fig. 5 is a side elevation of a governor for the admission of fuel, a sparking device being indicated. Fig. 6 is a perspective of devices for the supply and admission of fuel. Fig. 7 is a plan of the opposite side of the construction shown in Fig. 6. Fig. 8 is a section on line 8-8 of Fig. 7. Fig. 9 is a section on line 9-9 of Fig. 8.

Numeral 1 denotes a cylinder closed at its ends and surrounded by a water-jacket 2. An air-port is denoted by 3, and 4 denotes a check-valve. Said port alternately admits air to the cylinder and to the air and fluid mixing chamber within the hollow piston 6, according to the movement of the said piston.

As indicated in Fig. 1, a movement of the piston in the direction of the arrow *a* draws in outside air through port 3 and also compresses air in front of the piston moving in the direction of the arrow *a*. When the piston moves in the opposite direction, air is compressed in front of and within the hollow piston 6, being heated by such compression, as it is also on the other side of the piston when compression occurs by the above-described movement of the piston, which draws air in through port 3.

7 denotes an exhaust-port, which is covered by the piston except when the latter has moved to or near to the end of its path, as shown in Fig. 1, at which time it is uncovered to exhaust the products of an explosive combustion.

8 denotes a fluid-inlet, and 9 a mixing-chamber in which heated compressed air from the cylinder and a fluid fuel are mixed.

10 (see Fig. 8) denotes a fuel-admission port, and 11 a fuel-supply conduit having a needle-valve 12 of usual form to cut off the fuel-supply. This port is the exit-mouth of inlet 10, which receives fluid fuel from the conduit 11.

The admission-port 10 is normally closed by a valve 14, made of soft metal, to insure sufficient wear to provide a fluid-tight seat upon the face 15, in which said fuel-supply port 10 is situated.

The valve 14 is normally held upon its seat by a spring 16, arranged as shown and pulling on the end of an arm 17, fixed on a rotatable valve-stem 18, having a valve-supporting arm 19. The arm 19 is normally held by the spring 16, acting through arm 17 and stem or shaft 18 in manner to close the valve 14 over the admission-port 10.

20 is a valve-governor consisting of a bell-crank lever 21, pivoted at 22 to the rod 23 of an eccentric-strap 24, operated by an eccentric on the main shaft 25. A spring 26, bearing against a strap 28, carried by the rod 23, normally holds the arm 27 of the bell-crank lever against a stop 28, also carried on the eccentric-rod. 29 denotes a weight on the end of one arm of the bell-crank governor. The eccentric-rod may be supported in any usual manner, as by a rocking or swinging arm pivotally connected to and supported by the engine and loosely connected to the rod.

The spring 26 normally holds the upper arm of the bell-crank lever against the stop 28 and in range with an arm 31, loosely supported on the valve-stem 18, so that said arm is pushed by the governor-arm 27 at every forward movement of the eccentric-rod, whereby said arm 31 is moved against a transverse extension of arm 17, (see Fig. 8,) fixed on the

valve-stem 18, thereby turning the shaft or stem 18 and arm 19 and valve 14 and opening the admission-port.

32 denotes a returning-spring for the arm 31.

5 If, however, the speed of the engine increases beyond that desired and for which as a maximum the parts are adjusted, the eccentric in returning the eccentric-rod and the governor which is pivoted to it throws the
10 governor-weight toward the eccentric, and thereby overcomes the spring 26 and depresses the upper arm 27 of the governor-lever, so that it passes below and by the arm 31 and leaves the admission-valve closed.

15 39 denotes a finger carried by the eccentric-rod at every rotation of the engine-shaft against an arm 38 on a sparker-shaft 39^x.

The fuel, admitted as above described, is mixed with heated air in the chamber or conduit 9 under pressure which forces it through
20 conduit 37 into chamber 35, where the mixture is compressed and ignited by an electric sparking or some other suitable igniting device 36. The explosion thereby caused acts
25 through the chamber 35 upon the piston 6 and drives it forward until the exhaust-port 7 is uncovered, whereupon by the return of the piston by the main shaft 25 the operation is repeated, and the engine is thus continuously
30 driven. The direction of the inflow of air after entering through port 3 is controlled by an automatically-actuated valve 37^x in a conduit 37, having a port 35^x, communicating with chamber 35, and a port 9^x, communicating
35 with the air and fuel mixing chamber 9. The valve 37^x is closed by the action of the piston moving in the direction of the arrow by pressure through chamber 35 and port 35^x, and after explosion it is opened by pressure
40 from chamber 5, through port 9^x, the action in each case being aided by an exhausting effect on the opposite side of the valve.

It will be understood that the herein-described fuel-admission-valve construction is
45 such that no stuffing-box is required, thus avoiding leaking and other objections to the use of such devices.

By the compression of air in both movements of the piston that sent to the mixing-chamber is preheated, as also is the air forced
50 into the ignition-chamber, whereby the use of kerosene, gasolene, naphtha, or any inflammable fluid is facilitated, the heat of these chambers and their contents being maintained thereby. The engine can also be easily
55 adapted to the use of gas.

The use of a soft-metal easily-renewable valve in conjunction with a hard-metal valve-seat secures a perfect seating of the valve and
60 a constant closure of the admission-port, thus avoiding all leakage. By the use of such valve and of the described valve-actuating devices it is possible to avoid all loss of fuel and the disagreeable odor heretofore produced in
65 explosive-engines.

It will also be understood that the piston acts as a valve for the exhaust-port and that there is but one impulse to every revolution of the shaft, whereby the strain on the engine is less. The construction is also thereby
70 much simplified, friction and weight reduced, and other advantages secured.

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

75 1. In an explosive-engine having a fuel-supply conduit and an admission-port, a rocking valve-stem having an arm, and a valve on said arm adapted to be moved to and from the admission-port to control admission of fuel, said
80 valve being normally held closed, and a governor adapted to act on said arm to open the valve.

2. In an explosive-engine having a fuel-supply conduit and an admission-port, a rocking
85 valve-stem having an arm, and a valve on said arm adapted to be moved to and from the admission-port to control admission of fuel, said valve being normally held closed, and a governor adapted to act on said arm to open the
90 valve, the governor comprising a bell-crank weighted lever, an eccentric-rod loosely carrying the said weighted lever, and a stop to prevent overthrow of the governor.

3. In an explosive-engine having a fuel-supply conduit and an admission-port, a rocking
95 valve-stem having an arm, and a valve on said arm adapted to be moved to and from the admission-port to control admission of fuel, said valve being normally held closed, a governor
100 adapted to act on said arm to open the valve, the governor comprising a bell-crank weighted lever, an eccentric-rod loosely carrying the said weighted lever, a stop to prevent overthrow of the governor, and a spring to normally hold the governor-lever against the stop
105 and in range with a valve-opening part or arm.

4. In an explosive-engine, a valve normally closing the fuel-admission port and having a
110 rocking stem, an arm loosely connected to a suitable support by a spring, a fuel-admission governor movable against said arm and adapted to move it and compress the spring, an arm fixed on the valve-stem, and a spring acting
115 through the valve-stem to keep the valve closed, said latter arm being in the path of the loose arm whereby the valve may be opened by the governor.

5. In an explosive-engine, a valve normally closing the fuel-admission port and having a
120 rocking stem, an arm loosely connected to a suitable support by a spring, a fuel-admission governor movable against said arm and adapted to move it and compress the spring, an arm
125 fixed on the valve-stem, and a spring acting through the valve-stem to keep the valve closed, said latter arm being in the path of the loose arm whereby the valve may be opened by the governor, said governor being
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thrown out of range with the loose arm by excessive speed, to leave the valve closed.

6. In an explosive-engine, an admission-valve normally closed, a governor comprising
5 a weighted bell-crank lever pivoted to an eccentric-rod and adapted to open said valve, a stop fixed on and carried by said rod, a spring to hold the governor normally against said stop, an igniter having an arm in the path of
10 the rod, and an eccentric to which said rod is connected.

7. In an explosive-engine, an admission-valve normally closed, a governor comprising

a bell-crank lever pivoted to an operating-rod and adapted to open said valve, a stop fixed
15 on and carried by said rod, a spring to hold the governor normally against said stop, and an igniter having an actuating-arm in the path of the rod.

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

JOHN S. LOSCH.

Witnesses:

BENJ. R. CATLIN,
C. M. CATLIN.