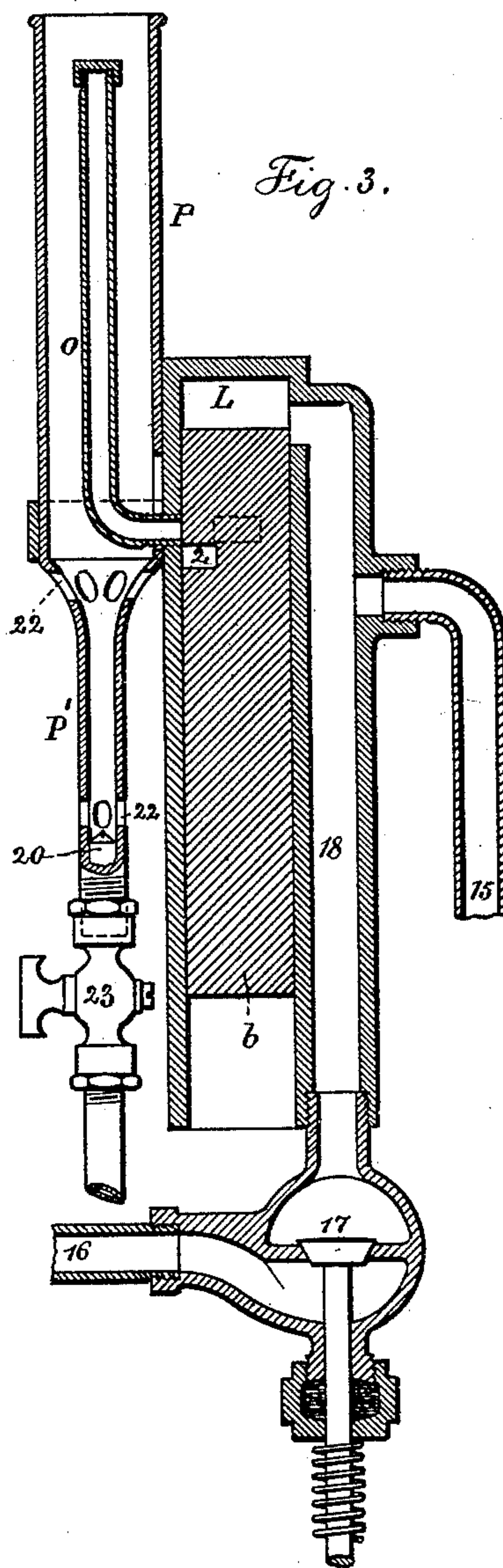
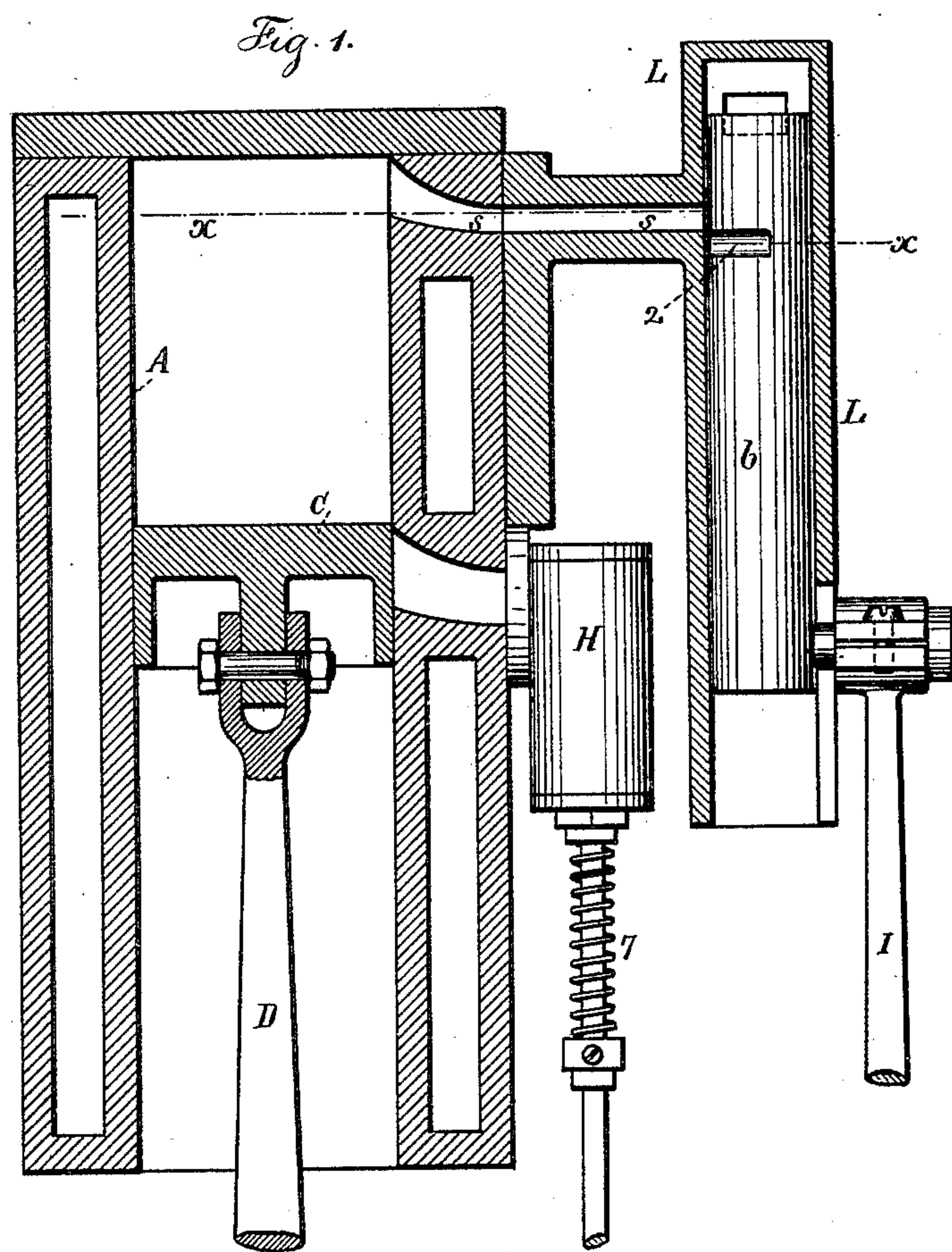
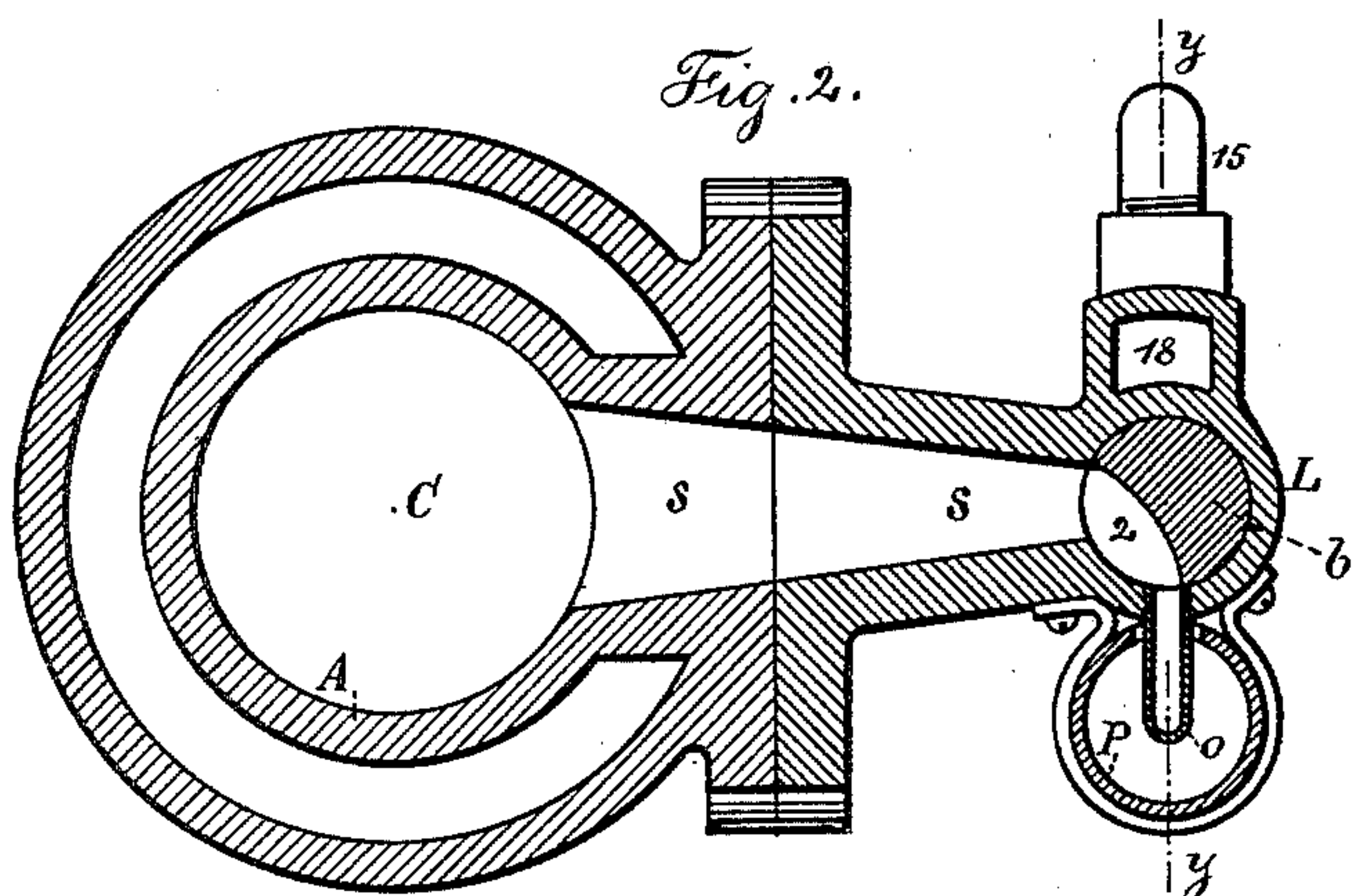


(No Model.)

S. LAWSON.
IGNITING DEVICE FOR GAS ENGINES.

No. 462,492.

Patented Nov. 3, 1891.



Witnesses:
J. Stail
Chas. H. Smith

Inventor:
Samuel Lawson
per *Lemuel W. Ferrell* atty.

UNITED STATES PATENT OFFICE.

SAMUEL LAWSON, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
ALONZO T. WELCH, OF SAME PLACE.

IGNITING DEVICE FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 462,492, dated November 3, 1891.

Application filed January 12, 1891. Serial No. 377,426. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL LAWSON, a citizen of the United States, residing in the city and State of New York, have invented an
5 Improvement in Igniting Devices for Gas-Engines, of which the following is a specification.

In Letters Patent No. 402,751, granted to me, an engine is represented in which the air
10 and gas are admitted, and there is a valve within a tubular case receiving its motion from a gear-wheel revolving once to every two revolutions of the engine-shaft.

My present invention is represented as applied to an engine of this character.

Before my invention an igniting device for a gas-engine had been made of a tube passing across a space heated by a flame or Bunsen burner.

20 In my present invention I am enabled to adapt an ignitor of this general character to the engine described in the aforesaid patent.

In the drawings, Figure 1 is a vertical section of the engine-cylinder and the valve-case. Fig. 2 is a horizontal plan at the line
25 xx , and Fig. 3 is a section at the line yy , Fig. 2.

The cylinder A is provided with a piston C, to which the rod D is connected, and II shows
30 the case for the exhaust-valve, which is closed by a spring 7 and opened by a cam, as in aforesaid patent.

The port s extends to the valve-case L, within which is a cylindrical plug b , forming the
35 valve, and this is moved by a rod I, extending to a crank-pin upon a wheel rotated once to every two revolutions of the main shaft of the engine, as in my aforesaid patent; but the valve or plug b , instead of being hollow, as in
40 the said patent, is solid and provided with a notch or port at 2. The air is admitted by a pipe 15 and gas is admitted by the pipe 16 and valve 17, and this valve 17 is raised by a cam at the proper time upon the engine-shaft,
45 and the parts are so timed that as the piston C descends the air and gas are mixed in the tube or chamber 18 as they pass into the case L and by the port s into the engine-cylinder A. As the piston C rises, the air and gases
50 in the upper part of the cylinder A are com-

pressed, and the parts are timed, so that the notch 2 in the valve B comes opposite the port s and in line with the ignitor O at the time the crank on the engine-shaft and the piston C reach their upward movement, and
55 at this moment the air and gas under pressure pass through this port s and notch 2 into the ignitor to be exploded, as next described. This ignitor O is in the form of a small tube bent at right angles and secured at one end
60 into a hole in the valve-case L, and such tube O stands vertically and is closed at the upper end. Around this tube O is a shield P to confine the Bunsen flame, which is produced by gas passing out at the jet-tube 20 into the
65 tube P' and mixing with a large volume of air admitted at the holes 22. The supply of gas is regulated by the cock 23. By this means the tube O is raised to a high temperature by the expenditure of a small quantity of gas,
70 and the temperature of said tube O is sufficient to ignite the mixture of air and gas that passes from the cylinder A into such ignitor O, and the gases explode in the port s and cylinder A, driving the piston downwardly
75 with a powerful force, due to the high pressure of the ignited gases.

In practice I find that the explosion of the air and gas and the movement of the piston produces a minus pressure or partial vacuum
80 in the ignitor O. Hence when the notch 2 coincides with the port s , the gas under pressure passes into this ignitor O, compressing any vapors that may remain in the same sufficiently to bring the fresh supply of air and
85 gas into contact with the hottest portion of the ignitor O; and it will be apparent that this ignitor O can be made of sufficient length to insure the proper contact of the fresh gases with the incandescent ignitor O to always in-
90 sure the positive ignition of the gases in the ignitor, the port, and the cylinder, and only a small flame is needed to keep the ignitor at the proper temperature, because the heat is applied at the bend in the igniting-tube and
95 the heated gases maintain the proper temperature of the upper part of the tube, and the fresh gases come directly into contact with the incandescent tube at the bend thereof, where the heat is most intense.

I claim as my invention—

The combination, with the cylinder and its port, of a valve-case parallel with the cylinder and air and gas inlet pipes, a cylindrical
5 valve, and means for sliding the same within the valve-case, a burner, and an igniting-tube with lateral connection to the valve-case, there being a port in the valve to connect the cyl-

inder-port to the ignitor, substantially as specified.

Signed by me this 6th day of January, 1891.

S. LAWSON.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.