

No. 754,001.

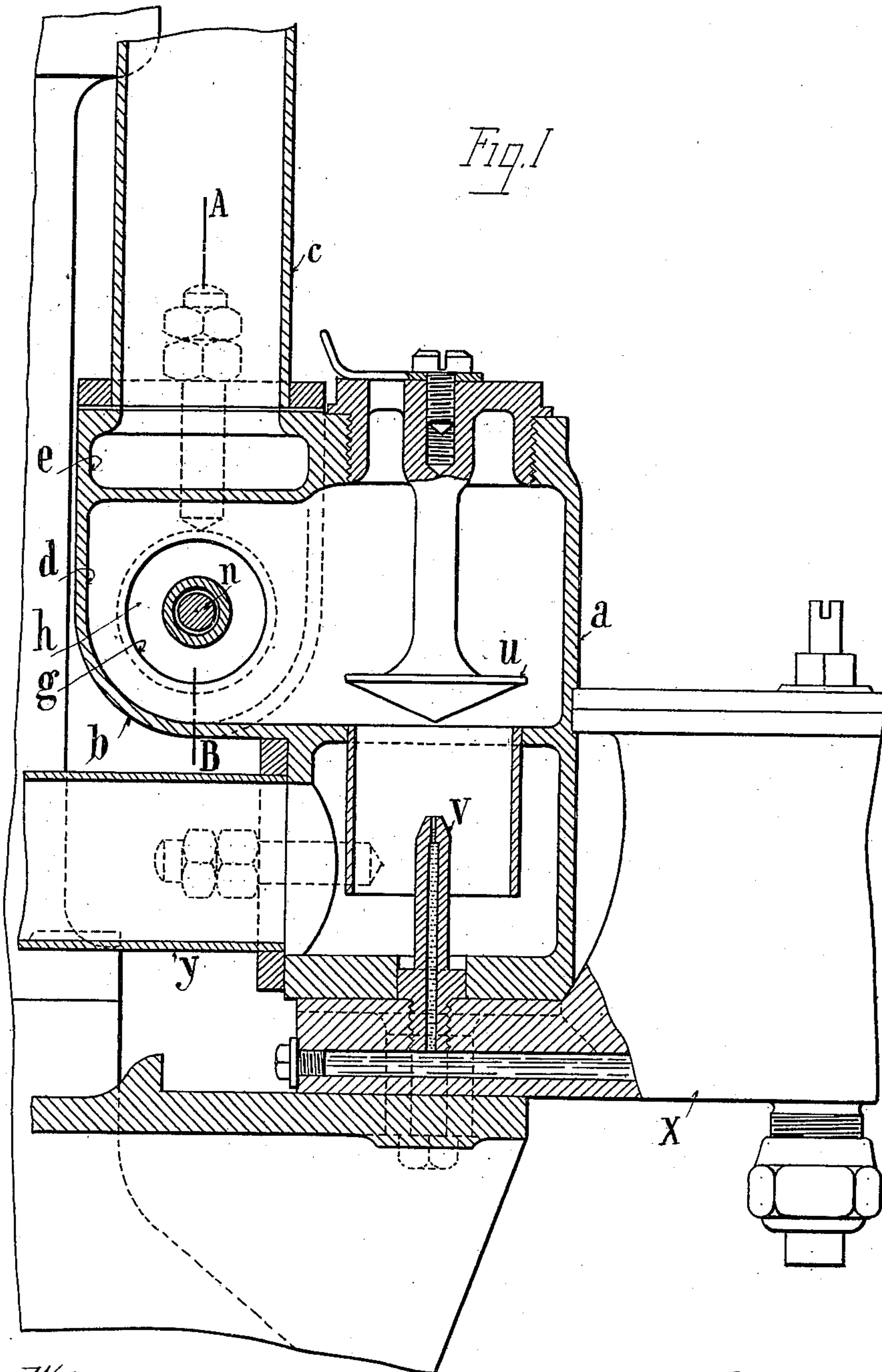
PATENTED MAR. 8, 1904.

M. MUTEL.
REGULATING DEVICE FOR ENGINES.

APPLICATION FILED OCT. 12, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2

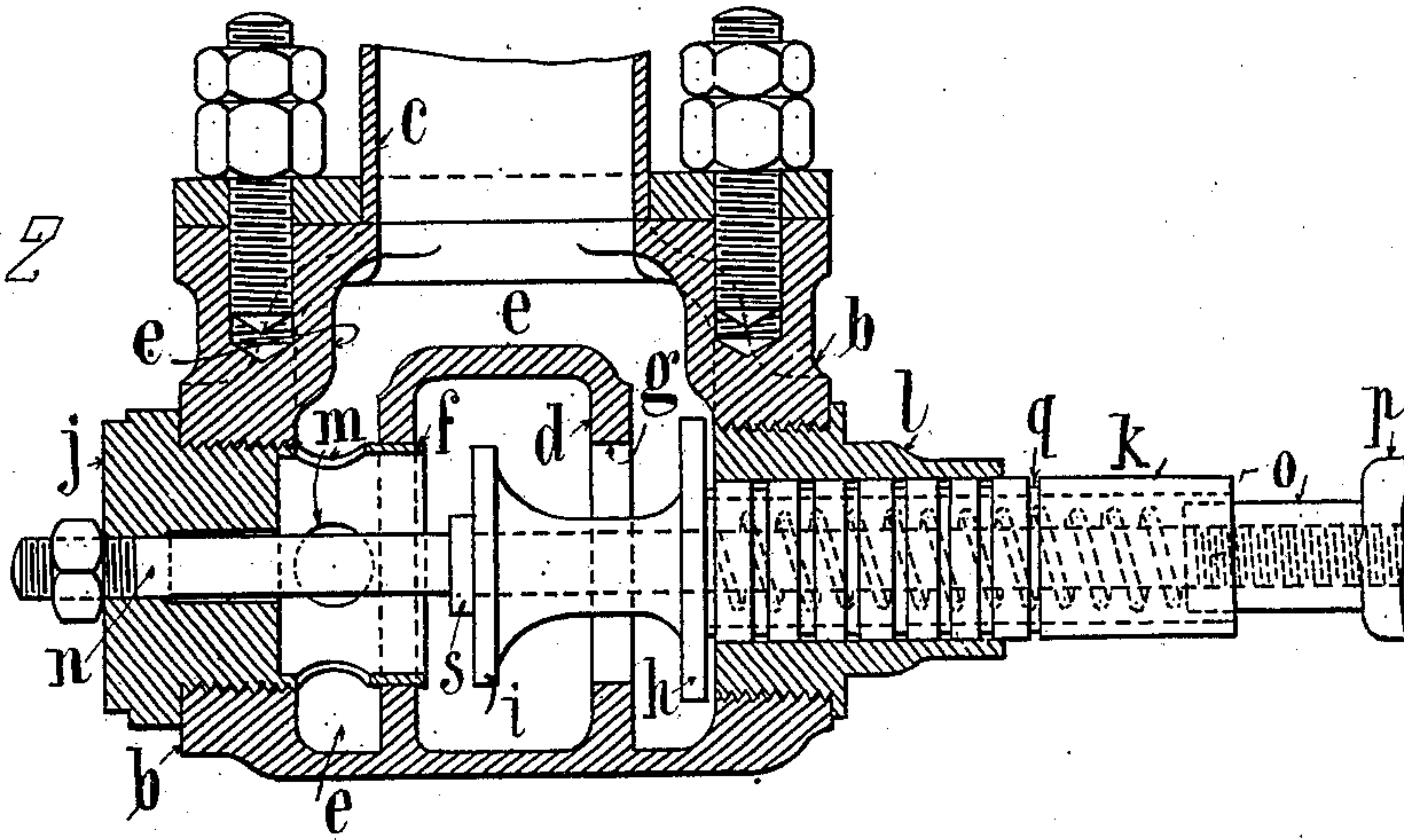


Fig. 3

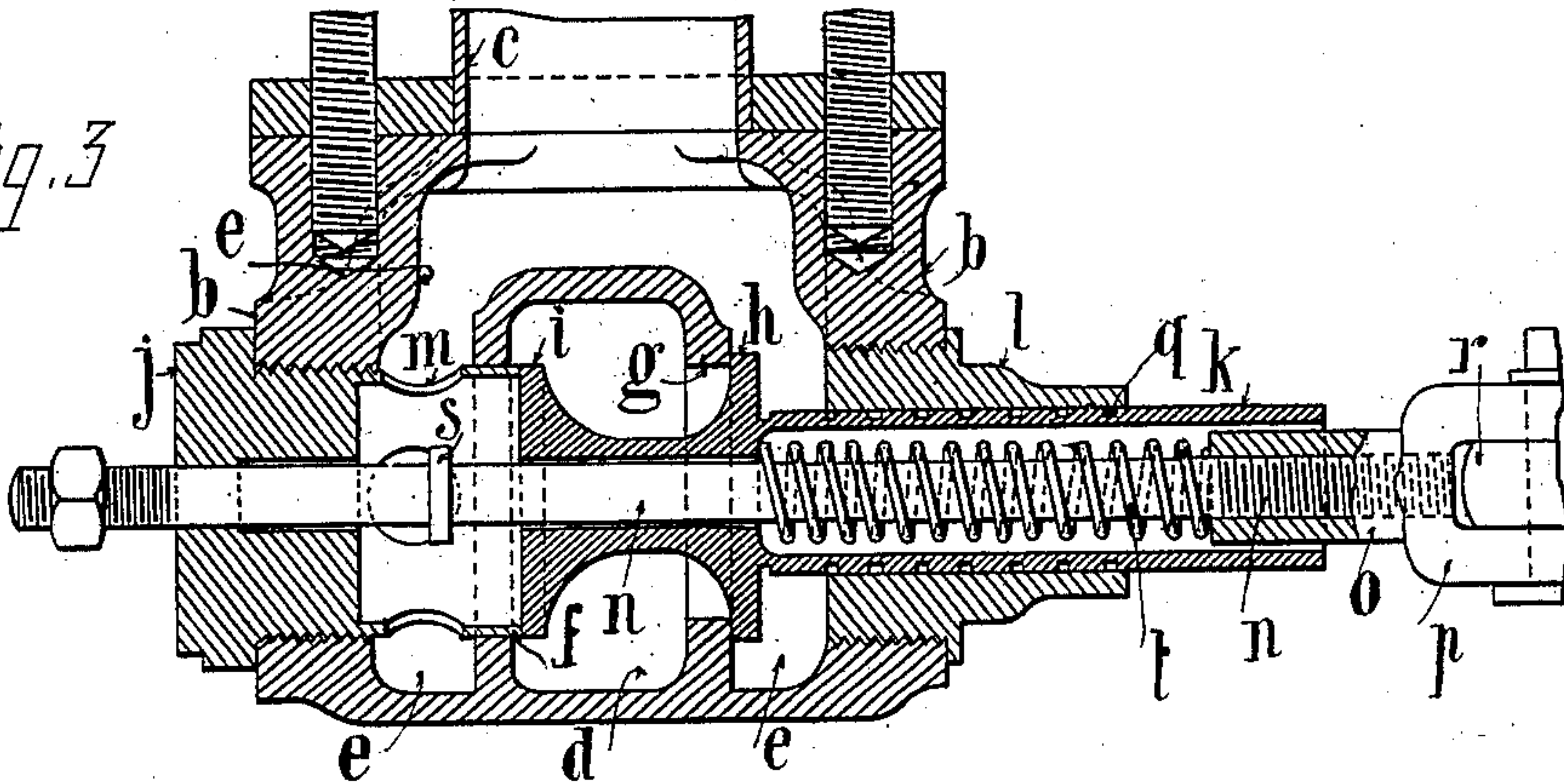
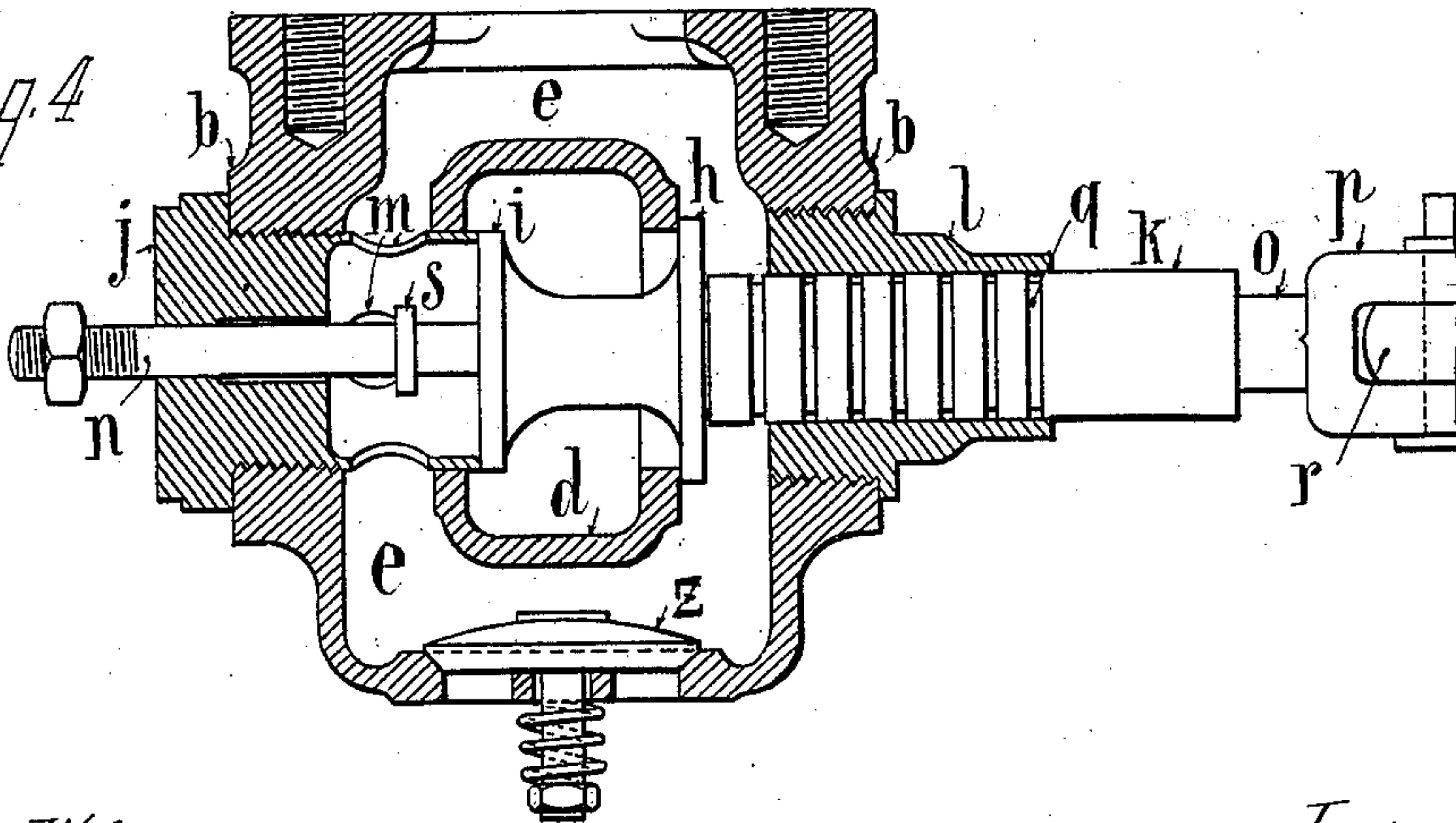


Fig. 4



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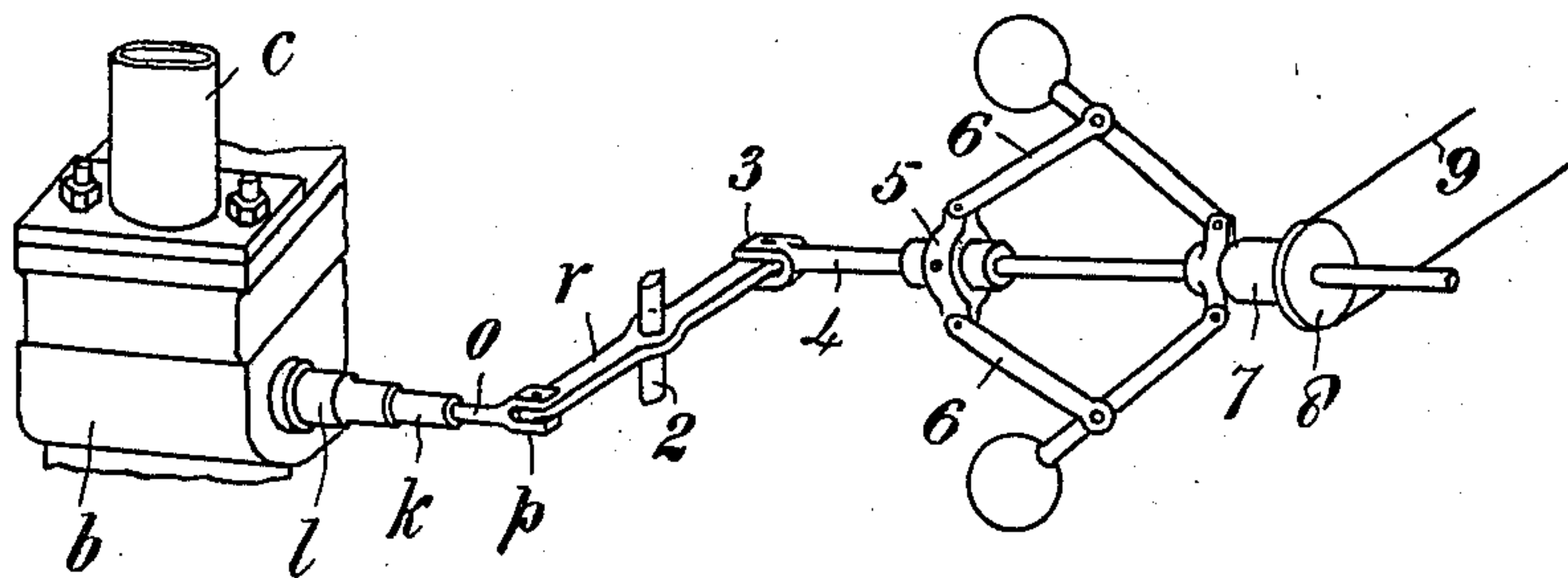
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Fig. 5



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UNITED STATES PATENT OFFICE.

MARCEL MUTEL, OF PARIS, FRANCE.

REGULATING DEVICE FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 754,001, dated March 8, 1904.

Application filed October 12, 1903. Serial No. 176,741. (No model.)

To all whom it may concern:

Be it known that I, MARCEL MUTEL, civil engineer, a citizen of the Republic of France, residing at 124 Rue St. Charles, Paris, in the Republic of France, have invented new and useful Improvements in Regulating Devices for Engines, of which the following is a specification.

The invention relates to a regulating device for engines, but particularly applicable to explosion-motors in which the governor acts on the admission-valve.

A characteristic feature of the device is that the governor is allowed to act on a double-seated balanced valve in order to open, to regulate, or to close the passage for the explosive mixture before it enters the admission-pipe.

Another characteristic feature consists in the elastic arrangement of the balanced valve on a rod actuated by the governor. The said valve thus becomes independent of the rod, carrying and moving the same after the valve rests on its seats, while its rod is further moved by the governor in the closing direction. One advantage of this arrangement is that the governor is allowed to continue its action in the closing direction without danger of damaging the seats of the valve by means of shocks or rough blows. Another advantage consists in the form and design which are given to the double-seat valve in order to submit its two exterior parts to oppositely-directed and practically equal forces of pressure, so that only an insignificant force is exerted on the rod moving the valve, and thus also on the regulator, this force being about the same as if the valve were placed in a medium without pressure.

In the annexed drawings, Figure 1 is a longitudinal section of the mixing-chamber provided with a casing containing a balanced valve. Fig. 2 is a cross-section on line A B of Fig. 1, showing a view of the balanced valve and its connection with the governor of the motor. Fig. 3 is a cross-section on line A B of Fig. 1, showing a cross-section of the balanced valve and its connection with the rod

actuated by the governor. Fig. 4 shows the same with the addition of an automatic valve for the admission of air to the cylinders while the balanced valve is closed. Fig. 5 is a perspective view illustrating the manner in which the apparatus may be connected with a governor.

The mixing-chamber *a* of a suitable carbureter is directly connected with a valve-casing *b*, preferably cast in one therewith. The casing *b* is arranged at the bottom of the admission-pipe *c* of the motor. It contains two chambers, an inner one, *d*, directly connected to the mixing-chamber *a*, and an outer one, *e*, directly connected to the pipe *c*. The vertical walls of the chamber *d* are provided with apertures *f g*, which give communication between the two chambers *d e*. The apertures *f g* serve as seats of the double-seated balanced valve *h i*, and the variation of opening or closing effected by the said valve is controlled by the governor in order to vary the admission of the mixture in the pipe *c*. The balanced double valve comprises in reality two valves *h i*, connected or formed together, the distance apart of which is such that the one bears against the outer wall of the chamber *d*, forming a seat in order to close the aperture *g*, while the other, *i*, is intended to close the aperture *f* and bears against an adjustable seat. This seat is formed by a hollow plug *j*, screwed into the valve-casing *b*, which plug is provided with holes *m* in order to allow a communication between the chambers *d* and *e* through the interior of the said plug *j*. A tubular projection *k*, fixed on the valve, is externally grooved at *q* to form an air-tight joint and to slide with very slight friction in a nipple *l*, screwed in the casing *b* opposite to the plug *j*.

A rod *n*, which passes freely the plug *j* and the valves *h i*, is fastened in the stem *o* of a fork *p*, connected with the lever *r*, which is moved by the governor of the machine in any suitable way. A collar *s*, fixed on the rod *n*, allows this rod to drag the valves *h i* along when it is moved in the direction of opening, Fig. 2. When, however, the rod *n* is moved

in the opposite direction, the collar *s* does not act on the valves after these latter are closed. In order that the valves may follow the rod *n* in its movement in the closing direction, a spring *t* is arranged around the rod *n* and within the tubular projection *k*, which is rigidly connected to the valves. This spring bears on the one end against the stem *o* and on the other end against the inner edge of the valve *h*. When the rod *n* is thus moved in the closing direction, the spring *t* causes the valves *h i* to move together with the rod *n*, Fig. 2. When, however, the valves have come in contact with their respective seats, the spring *t* can move them no farther; but the rod *n*, actuated by the governor may continue its movement in the closing direction. The valves thus become independent of the movement of the rod and remain closed while the spring *t* is compressed by the stroke of the stem *o*, Fig. 3. The valves remain closed as long as the governor does not move the rod *n* in the opening direction sufficiently far to bring the collar *s* again into contact with the valve *i* in order to open the port.

The sizes of the valves *h i* are different. The valve *i*, actuated by the pressure in the closing direction, is the smaller of the two, and the valve *h*, actuated by the pressure in the opening direction, is the larger. The difference of diameter is employed in order to compensate for the outer projection *k*, which is under the atmospheric pressure only. It thus serves as a compensator.

If owing to an excessive speed of the motor the valves *h i* are kept closed, it may be advantageous to admit fresh air into the cylinders. This condition is realized by the addition of an automatic valve *z*, Fig. 4, arranged on the casing *b* in a suitable position in order to allow the outer air to enter the chamber *e*.

The device can be combined with any mixing-chamber and with any desired system of carbureter. The drawing Fig 1 represents a mixing-chamber combined with a carbureter having a conical disintegrator *u*, against which the jet of the combustible liquid is directed. The jet comes from a mouthpiece *v*, fed by a suitable constant level reservoir *x*, and the air enters the chamber *a* by means of a pipe *y*. It will be obvious, however, that the valve is capable of regulating the admission of any working gas to an engine.

Fig. 5 illustrates the manner in which the apparatus may be connected to a governor. The lever *r*, connected to the fork *p* of stem *o*, is mounted on a fixed pivot at 2, and at its other end it is engaged by the fork 3 of a rod 4, connected to the sleeve 5 of a governor, the ball-arms 6 of which latter draw the sleeve 5 toward the stationary head 7 when they spread, owing the excessive speed communicated to them by the pulley 8 and belt 9, driven from a

suitable part of the engine in the well-known manner.

What I claim is—

1. In a regulating device for engines the combination with the governor of a rod connected therewith, a valve-casing through which the working gases must pass, a double-seated valve in said casing mounted loosely upon the governor-rod aforesaid therein, a spring connection between the governor-rod and the valve whereby the rod is allowed to move farther after the valve is closed on its seating, substantially as described.

2. In a regulating device for engines the combination with the governor of a rod connected therewith, a valve-casing through which the working gases must pass, a double-seated valve in said casing mounted loosely upon the governor-rod therein, the operating-faces of said valve being unequal, a tubular projection on the valve through which the governor-rod passes, a collar on said rod beyond the valve, and a spring in the tubular projection arranged in such manner as to tend to keep the valve pressed against its seatings or against the collar on the governor-rod.

3. In a regulating device for engines the combination with the governor of a rod connected therewith, a valve-casing through which the working gases must pass, a double-seated valve in said casing mounted loosely upon the governor-rod therein, the operating-faces of said valve being unequal, an adjustable seating for one operating-face of said valve in the casing, a tubular projection on the valve through which the governor-rod passes, a collar on said rod beyond the valve, and a spring in the tubular projection arranged in such manner as to tend to keep the valve pressed against its seatings or against the collar on the governor-rod.

4. In a regulating device for engines the combination with the governor of a rod connected therewith, a valve-casing through which the working gases must pass, a double-seated valve in said casing mounted loosely upon the governor-rod therein, the operating-faces of said valve being unequal, a tubular projection on one valve portion, a nipple on the valve-casing through which said projection passes, said projection thus being under atmospheric pressure whereby it serves to compensate the inequality of the valve-faces, a collar on the governor-rod beyond the valve and spring means tending to press the valve upon its seats or against the collar.

5. In a regulating device for engines the combination with the governor of a rod connected therewith, a valve-casing through which the working gases must pass, a double-seated valve in said casing mounted loosely upon the governor-rod aforesaid therein, a spring connection between the governor-rod

and the valve whereby the rod is allowed to
move farther after the valve is closed on its
seating and means for automatically admitting
air to the casing beyond the valve when said
5 valve is closed on its seating, substantially as
described.

In testimony whereof I have signed my name

to this specification in the presence of two sub-
scribing witnesses.

MARCEL MUTEL.

Witnesses:

P. CAYNET,

PAUL F. PAQUET.