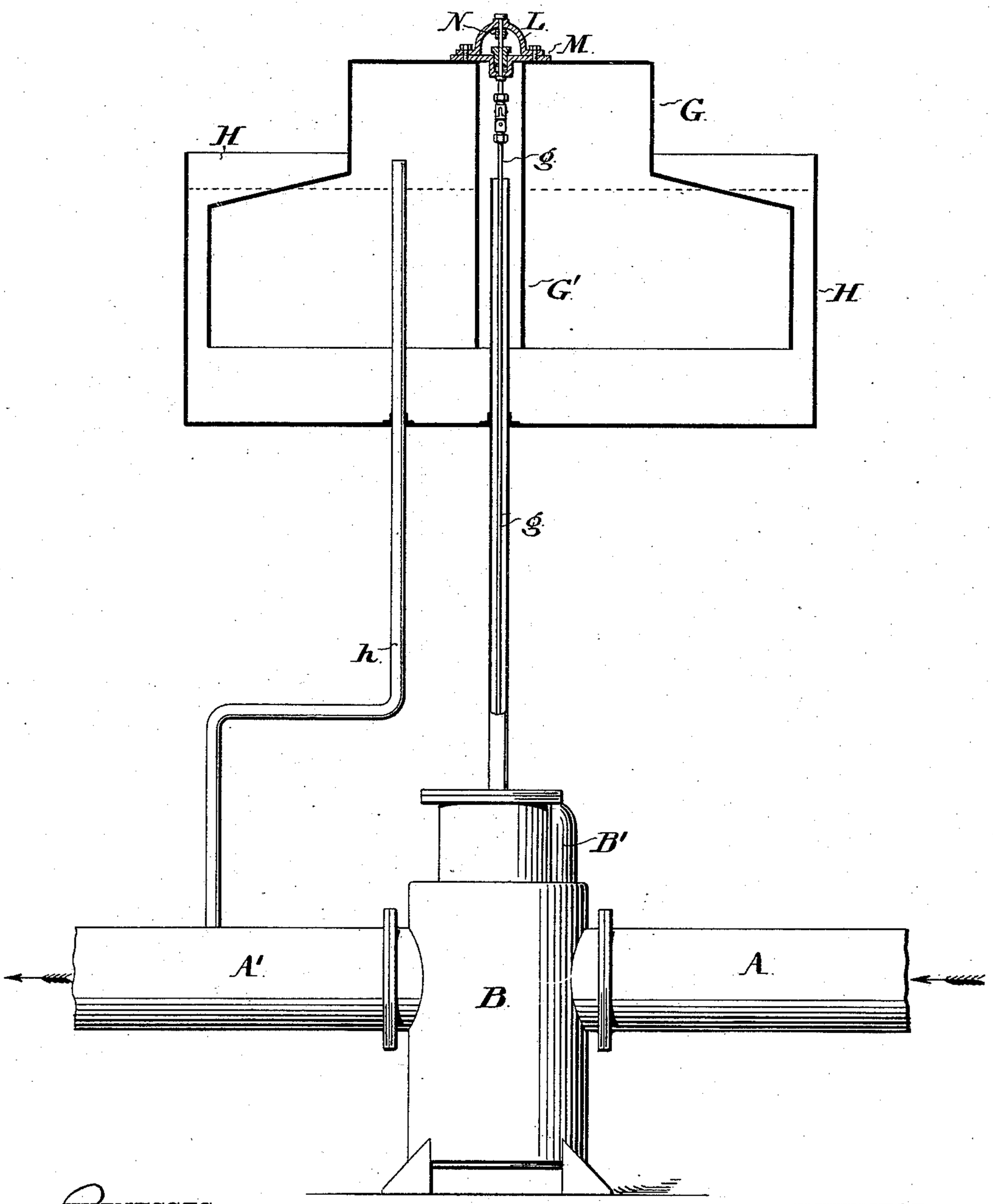
(No Model.) 3 Sheets—Sheet 1.

F. V. MATTON.

PRESSURE REGULATOR.

No. 524,970. Patented Aug. 21, 1894.

FIG. 1.



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(No Model.)

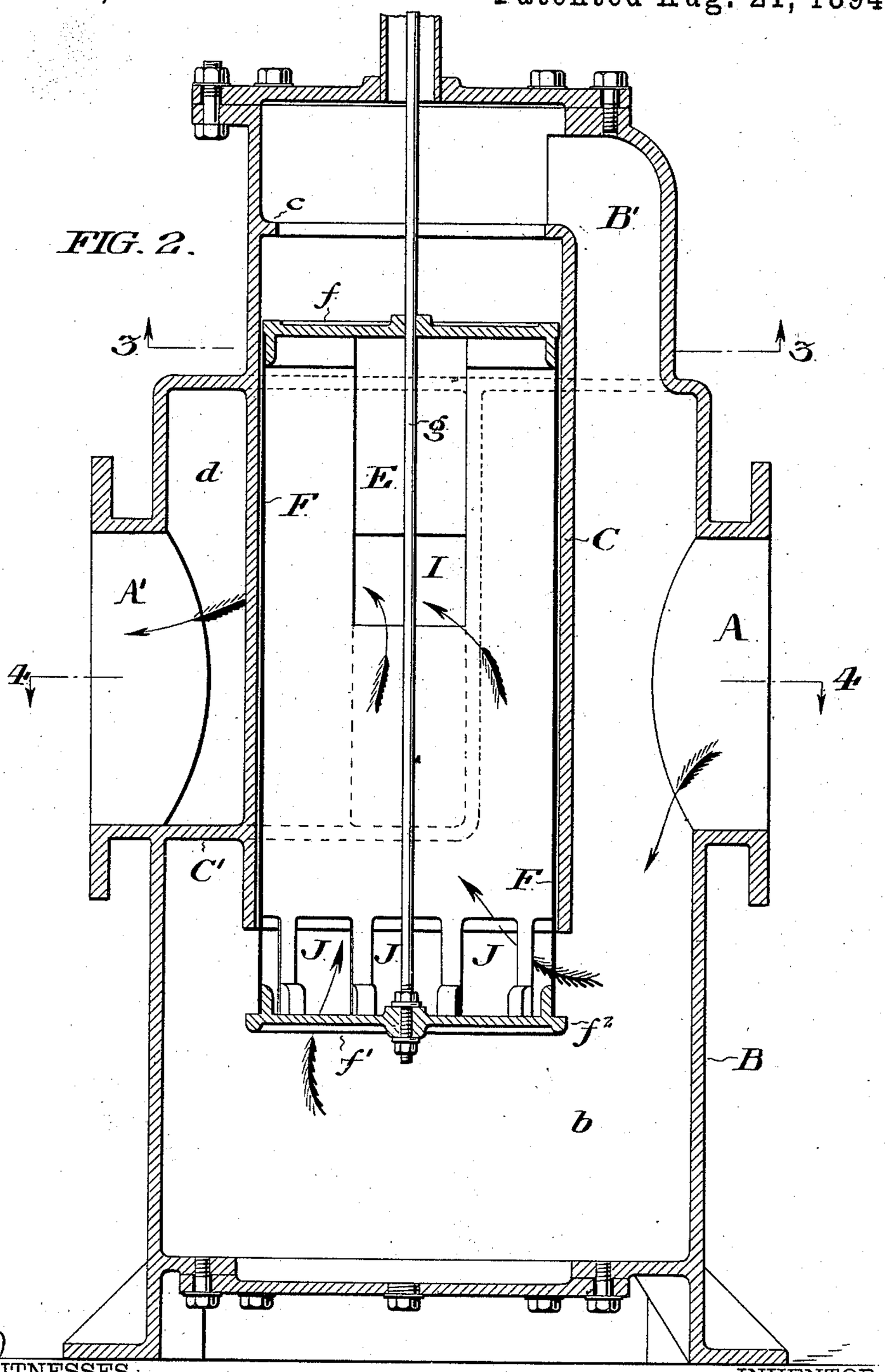
3 Sheets—Sheet 2.

F. V. MATTON.

PRESSURE REGULATOR.

No. 524,970. Patented Aug. 21, 1894.

FIG. 2.



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(No Model.) 3 Sheets—Sheet 3.

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PRESSURE REGULATOR.

No. 524,970. Patented Aug. 21, 1894.

FIG. 3.

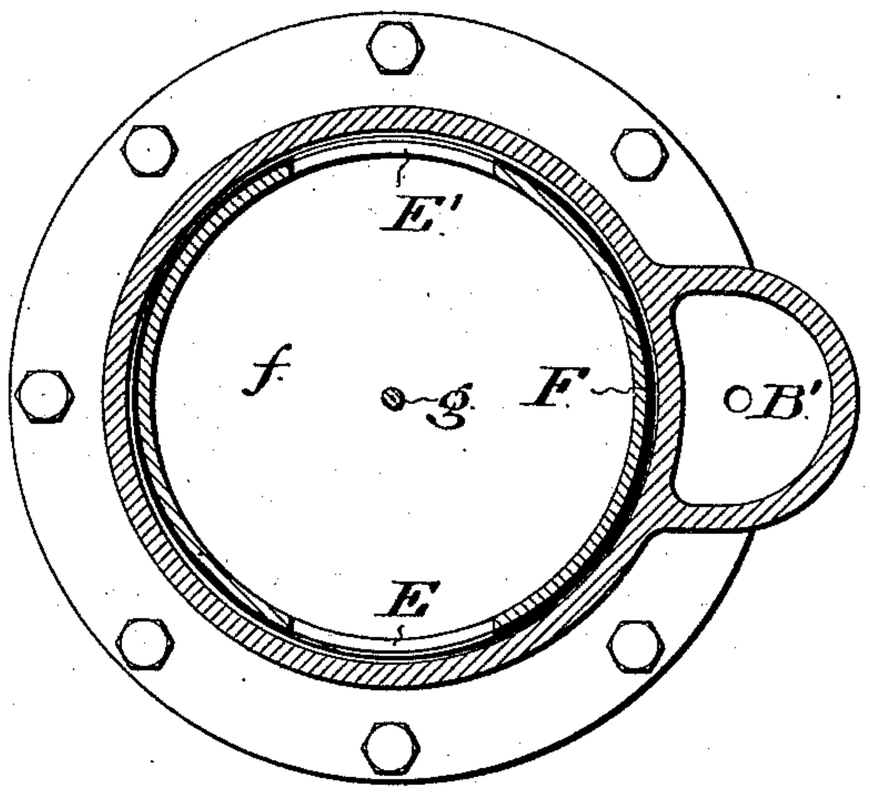


FIG. 4.

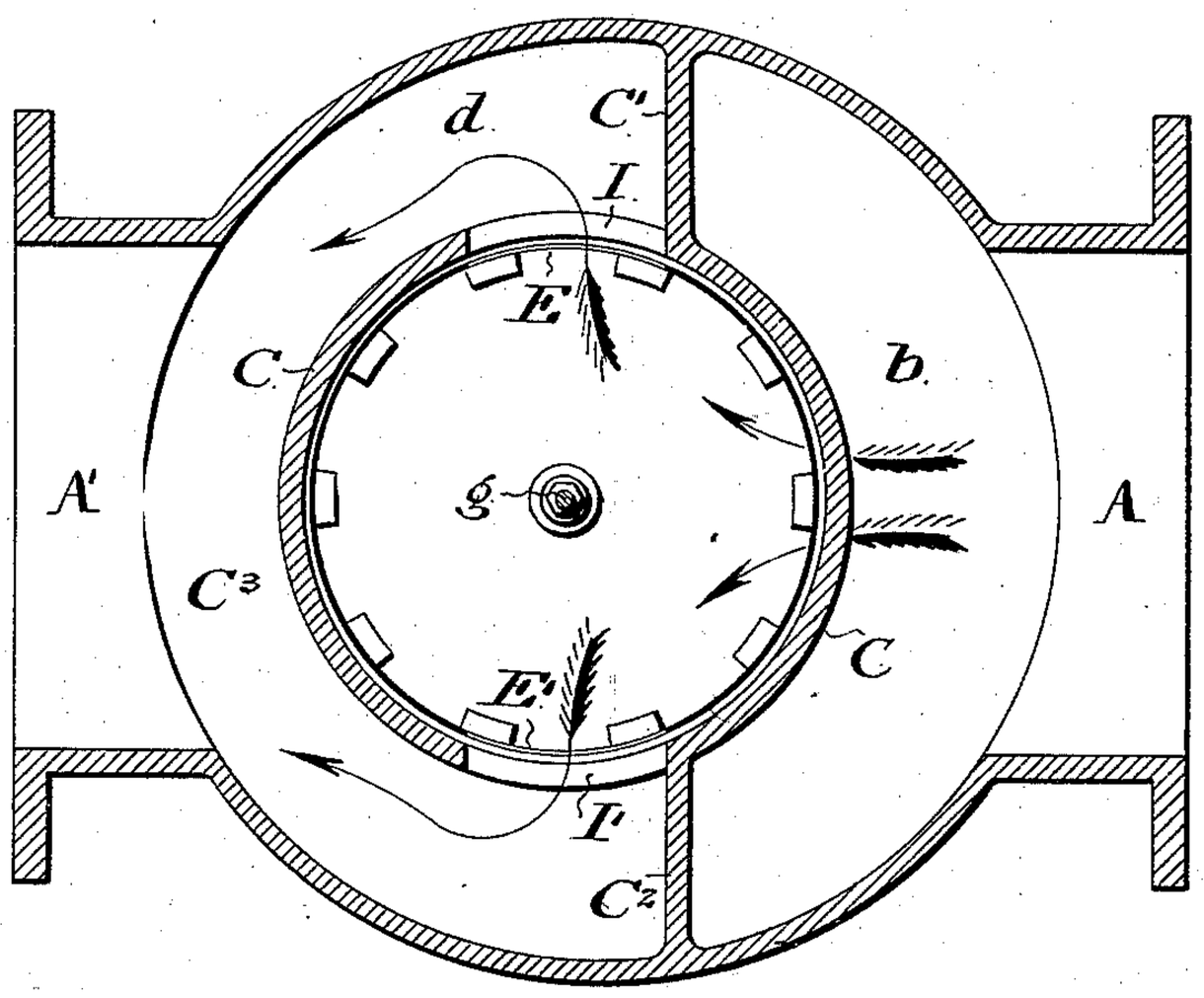
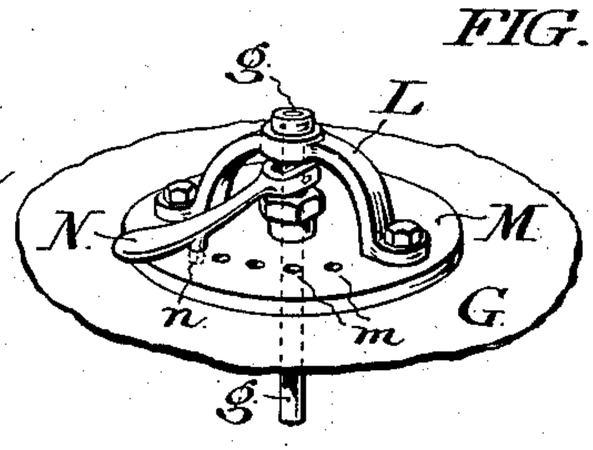


FIG. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK V. MATTON, OF CAMDEN, NEW JERSEY, ASSIGNOR TO THE CAMDEN IRON WORKS, OF SAME PLACE.

PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 524,970, dated August 21, 1894.

Application filed January 18, 1894. Serial No. 497,284. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK V. MATTON, of Camden, in the State of New Jersey, have invented certain new and useful Improvements in Governor-Valves for Gas-Pressure Regulators, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to what are known as automatic pressure regulators, such, for instance, as the device shown and described in Letters Patent of the United States, No. 328,681, dated October 20, 1885; and the principal object of my improvements is to facilitate the movement of the valve member in such an apparatus, while at the same time permitting it to completely cut off the flow under certain circumstances.

It will of course be understood that the broad principle of construction, whereby the valve member is moved in accordance with the demands of the distributing system, is not of my invention; but I have, for convenience of illustration, shown my improvements as embodied in a system whose main features are like that of the patent above mentioned.

In the accompanying drawings Figure 1 illustrates an exterior view of the valve-box, and the supply and distributing conduits, the actuating device for the valve being illustrated, diagrammatically, in vertical section. Fig. 2 represents a vertical central section, on an enlarged scale, through the valve-box, valve chamber and valve. Fig. 3 is a transverse section on the line 3, 3, of Fig. 2, looking upward. Fig. 4 is a transverse section on the line 4, 4, of Fig. 2, looking downward. Fig. 5 is a detail view showing the method whereby the valve rod is attached to the actuating device.

Referring to the general view of Fig. 1, A represents the supply pipe, communicating with the gas holder, or other reservoir of gas under pressure, and A′ the distributing pipe, the communication between said pipes being controlled within the valve-box, B, by means of a movable valve attached to a rod, *g*, which is suspended from a bell-float, G, partly submerged in water within a tank, H.

Communication between the distributing pipe, A′, and the interior of said bell-float is maintained by means of a pipe, *h*, in such manner that the rise or fall of the bell-float occurs in conformity with increase or diminution of pressure in the distributing main, the movements of the bell-float, in one direction or the other, actuating the valve in the direction proper for increasing or diminishing the flow of gas to the desired extent.

Referring now to the remaining figures, the nature of my improvements will be set forth.

Within the valve-box, B, is a cylindrical valve chamber, C, open at top and bottom, but connected with the wall of the valve-box by means of continuous vertical partitions, C′, C^2, and a horizontal partition, C^3, which partitions divide the valve box into two compartments, one of which, *b*, is in direct communication with the supply pipe, A, the other compartment, *d*, being in direct communication with the distributing pipe, A′.

Lateral openings, I, I′, formed in the wall of the valve chamber, C, afford a direct communication between the interior thereof and the compartment, *d*, while the valve chamber communicates directly at its lower end with the compartment, *b*, and indirectly at its upper end by means of the duct B′.

The valve, F, which controls the communication, consists of a cylinder of sheet metal, having a closed top, *f*, and bottom, *f′*, the latter of which is of slightly greater diameter than the cylindrical portion so as to afford an annular flange, f^2, around the exterior. The cylindrical portion of the valve fits loosely within the valve chamber so that there is substantially no frictional contact between it and the wall thereof.

Lateral openings, E, E′, are formed in the sides of the valve, corresponding in location with the openings, I, I′, respectively, in the valve chamber. A series of lateral openings, J, is formed around the lower portion of the valve to permit free communication between the interior thereof and the compartment *b*.

In the upper portion of the valve chamber, and at a height above the lower end thereof, which exactly corresponds with the distance between the face of the valve flange, f^2, and the outer rim of the valve top, *f*, is formed an internal annular flange, *c*, whose under surface is adapted to make a snug joint with the

upper surface of the rim of the valve top, *f*, when the valve is in its highest position, a close joint being also formed at the same time, between the flange, f^2, and the lower end surface of the valve chamber, C.

The operation of the parts just described, is as follows: In the position shown in Fig. 2, the valve is partly open, as the lower portions of the lateral openings, E, E′, overlap the upper portions of the openings, I, I′, in the valve chamber C. The series of openings, J, is also below the lower end of the valve chamber, and the gas flows freely through in the direction of the arrows. There being no frictional contact between the cylindrical portion of the valve and the wall of the casing, perfect freedom of movement is insured, so that the apparatus responds to very minute changes of pressure within the distributing pipe, and hence insures delicate regulation. During the period when the valve is open, there is of course a slight leakage from the supply pipe into the distributing pipe, owing to the looseness of the fit between the valve and its chamber, but this may be disregarded, as it has no practical effect during the period of substantial flow. When, however, the valve rises so as to completely cut off the communication between the openings, E, E′, and I, I′, the exterior flange, f^2, will come into close contact with the lower edge of the valve-chamber, and simultaneously the outer rim of the top, *f*, will come into close contact with the flange, *c*, making a practically close joint, the pressure upon the respective ends of the valve being very nearly balanced under these circumstances, and the slight excess at the lower portion tending to insure close contact.

To afford means for regulating very minutely the area of the valve openings, I provide the device shown in Fig. 5.

The upwardly projecting end of the rod, *g*, by which the valve is suspended, is carried through the top of the bell, G, and is hung upon an arched bridge-piece, L, secured to a plate, M, mounted upon the top of the bell, G. An arm, N, is pivotally secured to the rod, *g*, beneath the bridge, L, said arm being provided with a downwardly depending stud, *n*, adapted to enter any one of the holes, *m*, in the plate, M. When the stud, *n*, is in one of said holes, the rod is of course locked against horizontal movement; but by lifting the arm, N, so as to clear the stud, it can be turned to rotate the rod, *g*, axially throughout a considerable arc. Such rotation of the rod will of course rotate the valve, F, and will change the relation of the openings, E, E′ thereof to the openings, I, I′, so that the extent of communication can be adjusted as desired, the operation of the apparatus in other respects remaining of course as above stated.

Having thus described my invention, I adopt the following terms to avoid undue prolixity of my claim, viz: By the term actuating float I indicate the bell-float in communication with the distributing pipe and provided with a suitable tank containing liquid; by the terms supply division and exit division I indicate, respectively, the compartment, *b*, of the valve box in communication with the supply pipe, A, and the compartment, *d*, of the valve-box in communication with the distributing pipe, A′.

I claim—

A gas pressure regulator system comprising supply and discharge pipes, an intermediate divided valve box, an actuating bell-float, a passage between the bell-float and the discharge pipe, a chamber in said valve box, said chamber communicating at its side with the exit division and being open at its lower end and supported above the supply division, a valve closed at its ends fitting loosely in said chamber and projecting below the open bottom of the valve chamber, the valve having lateral openings in communication, respectively, with the supply division and the exit division, a flange at the lower end of said valve below the open end of said valve chamber and adapted to make a close joint with the lower end of said chamber, a flange at the upper end of the valve chamber adapted to make a close joint with the upper end of the valve, and means whereby said valve is operatively connected with the actuating float, substantially as described.

FREDERICK V. MATTON.

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