

No. 702,026.

Patented June 10, 1902.

J. F. McELROY.
VALVE REGULATOR AND GOVERNOR.

(Application filed Mar. 13, 1899.)

(No Model.)

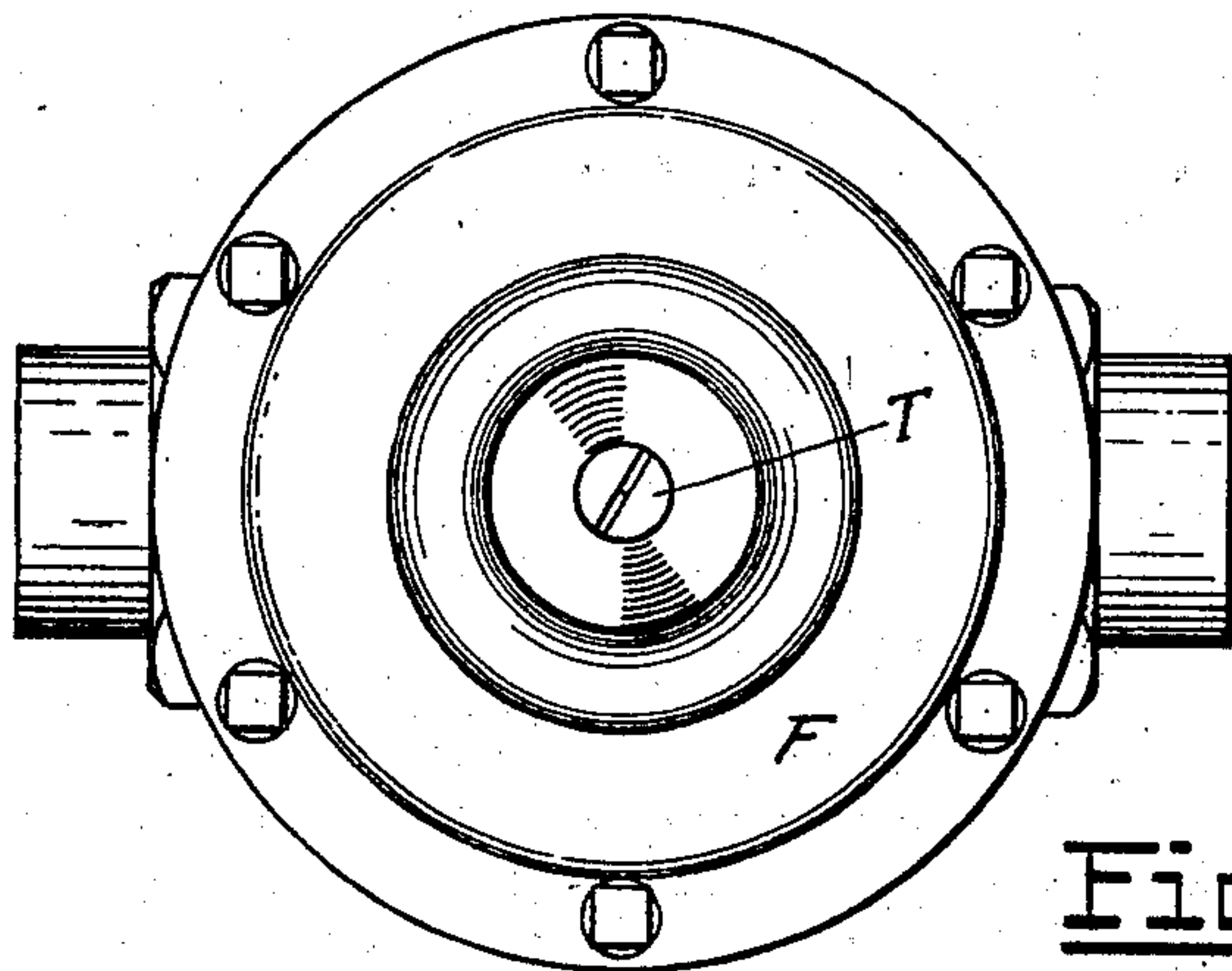


Fig. 1.

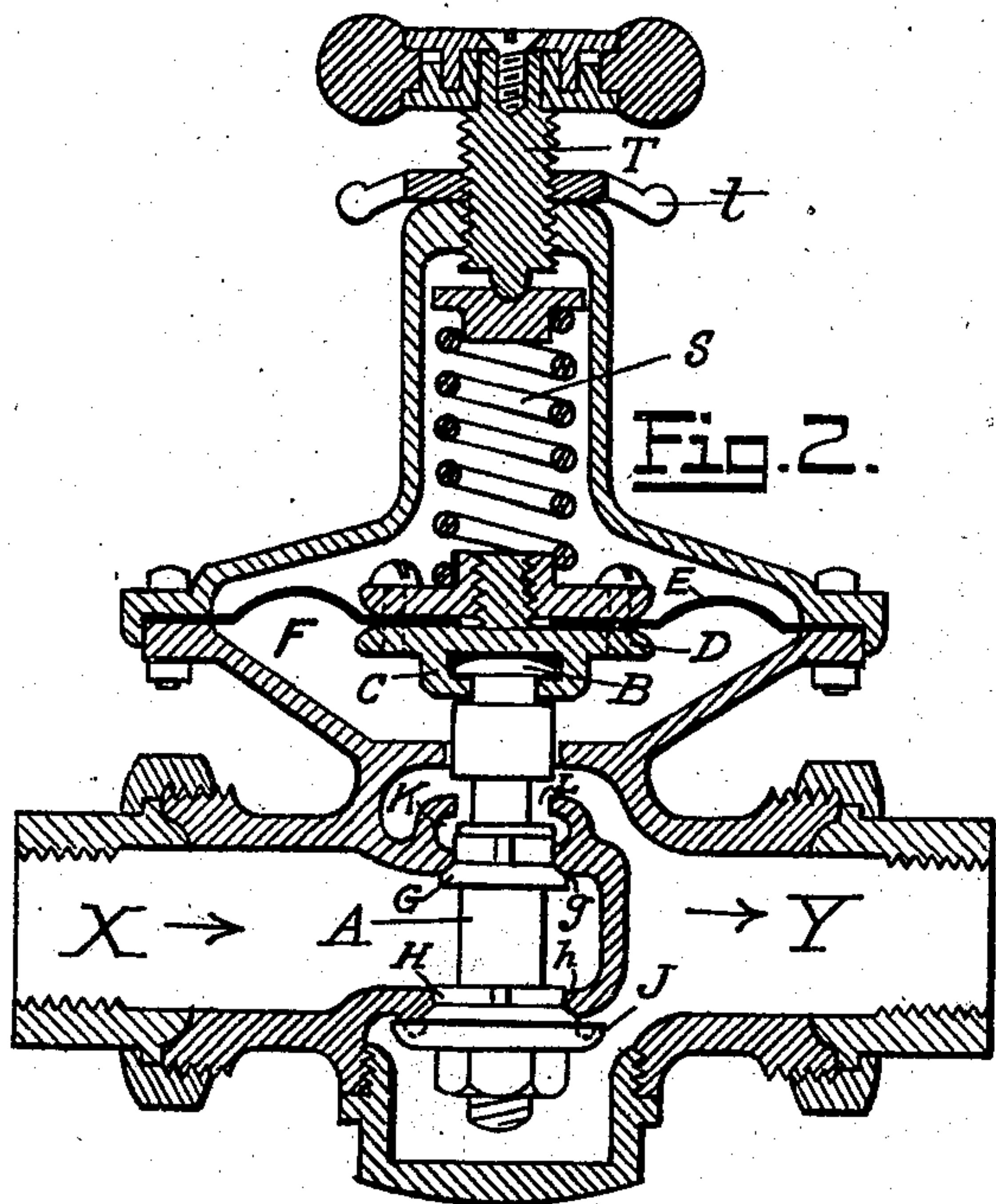


Fig. 2.

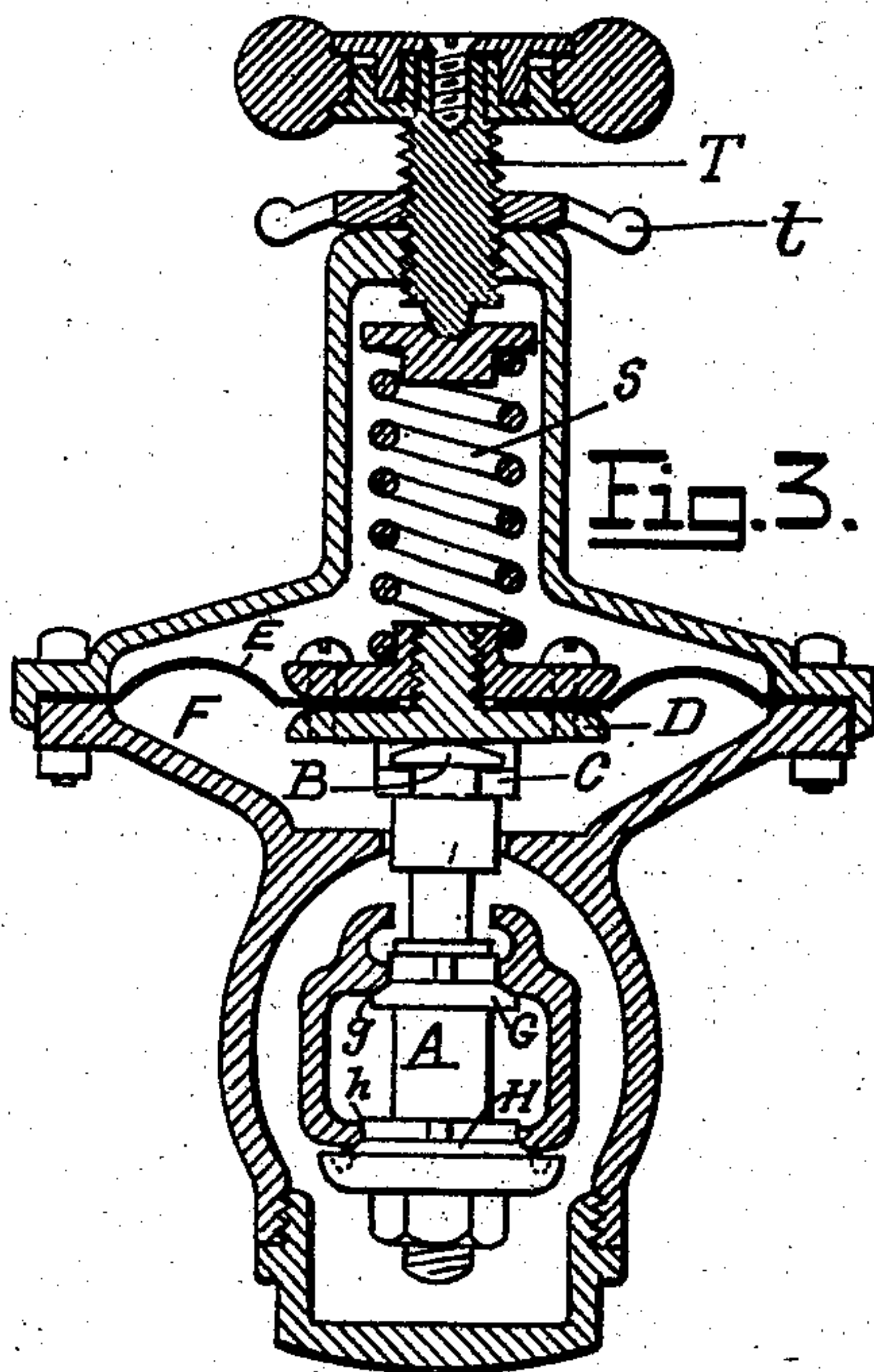


Fig. 3.

Witnesses

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Attys

UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR-HEATING COMPANY, OF ALBANY, NEW YORK, A CORPORATION OF WEST VIRGINIA:

VALVE REGULATOR AND GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 702,026, dated June 10, 1902.

Application filed March 13, 1899. Serial No. 708,856. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States of America, and a resident of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Valve Regulators and Governors, of which the following is a specification.

My invention relates to valve regulators and governors; and the object of my invention is to provide a regulator in which the opening and closing of the valve shall depend upon the combined pressure and flow of the fluid. I attain this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is a longitudinal section, and Fig. 3 is a cross-section.

Similar letters refer to similar parts throughout the several views.

X represents the inflow and Y the outflow chamber.

A is a valve-stem, which is preferably provided at one end with a partially-rounded head B, adapted to engage with the lugs C on the casting D, to which the diaphragm E is attached. It will be noticed that the head B of the valve-stem may be placed in its position in the casting very readily and removed therefrom without interfering with other parts of the diaphragm connection; also, that having its head slightly rounded a movement of the diaphragm to one side or the other will not affect the alinement of the valve-stem, and therefore will not in any way tend to cause a binding of the valve-stem.

The diaphragm E is preferably secured in the valve-casing along the outer edges at suitable points and is secured in the casting D in any suitable manner. On the casting D the spring S has a seat, which spring is regulated by a suitable bolt T and nut *t* or in any convenient way. The adjustment of the bolt T regulates the intensity of the spring upon the valve-casing. The chamber F, in which the diaphragm is placed, communicates with the outflow-chamber Y by means of a very restricted opening around the sides of the valve-stem A, which valve-stem passes

through a portion of the outflow-chamber Y. I have shown the valve-stem provided with two valve-disks G and H, adapted to engage with the valve-seats *g* and *h*, respectively, thus making a balanced valve. I do not wish to limit myself to this construction, since I may attain the same results with a single seat-valve. I preferably arrange one of the disks H of the valve with a projecting disk J, which projecting disk is placed beyond the seat *h*. As thus arranged when the valve-disk H is forced from its seat *h* the fluid passing through it will impinge on the disk J, tending to open the valve still wider, and thus the flow of the fluid through the opening will tend to increase that opening. I also arrange in connection with the valve-seat *g* or adjacent thereto, as illustrated in the accompanying drawings, a cell K, provided with a restricted opening L into the outlet-chamber Y, which may be made in the form shown in Figs. 2 and 3 or in any other form, the function of the cell being to cause the flow of the fluid contained in the chamber X to be restricted in its passage after entering the cell K, and thus tend to force the disk G farther from its seat *g*, thus increasing the flow of the fluid into the chamber Y.

Heretofore in regulating-valves when the system has been reduced in pressure, which allows the spring to force open the valve, the flow into the system is just as little whether the pressure in the outflow-chamber is reduced fifty per cent. or only five per cent. It is desirable to have the flow very much greater when the system has become very much reduced. In other words, the flow into the system should be proportioned to the pressure in the system, the object of a regulating-valve being to maintain pressure or quantity of fluid in the system connected with the outflow-chamber at a certain predetermined amount. When, therefore, excessive drafts are made upon the system, which reduce the pressure on the diaphragm and allow the fluid to pass into the system, the result desired to be attained is to have the system come up as quickly as possible to the predetermined degree. It will be some time doing

this under the circumstances suggested unless the valve is opened as wide as possible under any circumstances, and the wider the valve can be opened the quicker the system
5 will be in its proper working condition. This is provided for in my invention. Just as soon as the valve is opened at all the flow of the fluid will tend to force it open as far as possible and allow just as much escape of
10 the fluid as can be had, the flow continuing, of course, until the pressure upon the diaphragm counteracts the energy of the spring and closes the valve completely.

By my construction of the valve-stem in
15 such a manner that it can be inserted readily into the casting D and by my arrangement of the diaphragm within the casing along its edges I can readily remove the parts for the purpose of repairing the same or replacing
20 broken members, and at the same time I can by this means effectively pack the diaphragm, so that there shall be no escape of the actuating fluid above the diaphragm. By my construction of the valve-stem head I can also
25 insure the positive movement of the valve-stem, and thus make a connection between the valve disk and seat which will not leak.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a regulating-valve, a valve-stem, a valve-disk, a seat, with a cell adjacent to the valve-seat provided with a restricted opening leading to the outlet-chamber, so arranged
35 that the flow of the fluid into the cell and its retention there because of the restricted discharge, will tend to force farther open the valve from the seat, and permit a greater flow of fluid to the system, substantially as described.

2. In a regulating-valve, a valve-stem, provided with a rounded head, a casting, a diaphragm secured to said casting, lugs attached to said casting adapted to engage with said valve-head, permitting the movement of the
45 diaphragm on the valve-stem without destroying the alinement of the valve-stem, substantially as described.

Signed by me at Albany, New York, this 11th day of March, 1899.

JAMES F. McELROY.

Witnesses:

W. W. ERWIN,

CHAS. B. MITCHELL.