

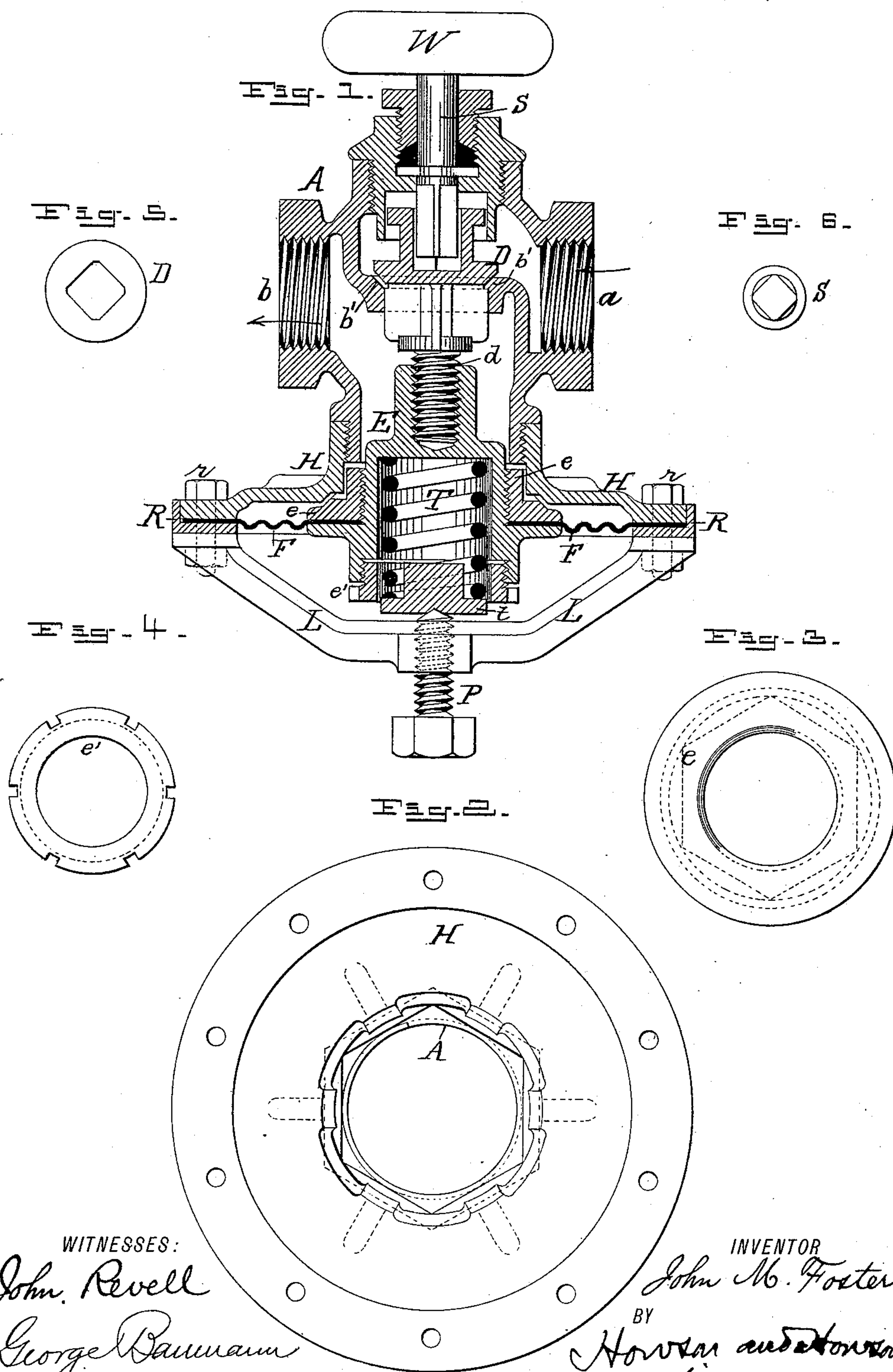
(No Model.)

2 Sheets—Sheet 1.

J. M. FOSTER.
AUTOMATIC REGULATING VALVE.

No. 483,979.

Patented Oct. 4, 1892.



WITNESSES:

John. Revell
George Baumann

INVENTOR

John M. Foster
BY
Horton and Son
his ATTORNEYS

(No Model.)

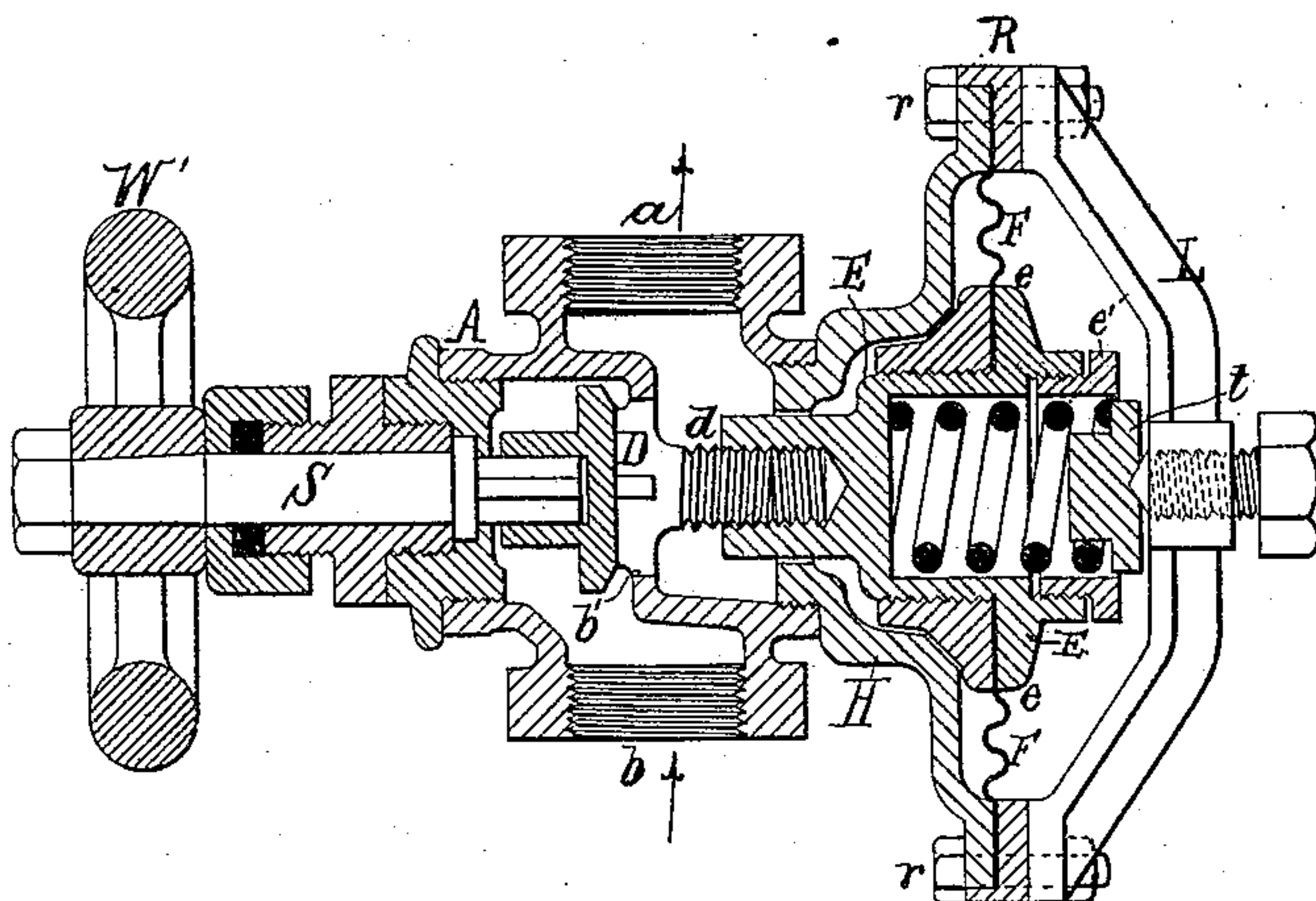
2 Sheets—Sheet 2.

J. M. FOSTER.
AUTOMATIC REGULATING VALVE.

No. 483,979.

Patented Oct. 4, 1892.

FIG. 7.



WITNESSES:

George Baumann
James Gracie

INVENTOR

John M. Foster

BY

Horton T. Horton
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN M. FOSTER, OF CRANFORD, ASSIGNOR TO THE FOSTER ENGINEERING COMPANY, OF NEWARK, NEW JERSEY.

AUTOMATIC REGULATING-VALVE.

SPECIFICATION forming part of Letters Patent No. 483,979, dated October 4, 1892.

Application filed May 15, 1891. Serial No. 392,908. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. FOSTER, a citizen of the United States, and a resident of Cranford, Union county, New Jersey, have
5 invented an Improved Automatic Regulating-Valve, of which the following is a specification.

The object of my invention is to construct a simple and easily-adjusted automatic regulating-valve.

In the accompanying drawings, Figure 1 is a vertical section of one form of my improved automatic regulating or reducing valve. Fig. 2 is an inverted plan view of the casing with
15 the diaphragm removed. Figs. 3, 4, 5, and 6 are views of details. Fig. 7 is a vertical section of a modified form of my regulating-valve.

The regulator is, in general principles of construction, somewhat similar to my regulating valve and governor, for which I have
20 obtained Letters Patent of the United States No. 414,975, dated November 12, 1889, and also to the fluid-pressure governor for which G. Kimball obtained Letters Patent of September
25 23, 1890, No. 436,858.

A is the valve-casing, with an inlet *a* and outlet *b* and a seat *b'* for the valve D. The stem of this valve is threaded at *d* and engages with a corresponding thread in the hub E,
30 carried by the diaphragm F. In the present instance the rim of this flexible diaphragm is secured by a ring R and bolts or screws *r* within the rim of the dish H, which is fitted to the valve-casing and is practically a part
35 thereof.

To counteract the pressure of the fluid upon the inner side of the diaphragm, I provide on the outside a spiral spring T, resting at one end upon the hub of the diaphragm and hav-
40 ing at its outer end a bearing-nut *t*. Upon this nut bears the inner end of the adjusting bolt or screw P, which is threaded through and is adjustable in a yoke L, carried by the casing. By turning this bolt or screw the
45 tension of the spring may be readily adjusted, according to the counteracting effect desired, against fluid-pressure upon the diaphragm. For economy in space and convenience of construction, I make the hub E of the diaphragm
50 hollow where it passes through the diaphragm, and I arrange the ring T within the depressed

cup thus formed. An adjustable screw-collar *e'* is preferably provided at the mouth of this cup to serve as a stop by coming against the yoke L to prevent undue expansion of the
55 diaphragm.

The nut, by which the diaphragm is clamped to the hub E, is made of a polygonal shape, Fig. 3, and the corresponding part of the dish H, Fig. 2, is made of a similar shape to receive
60 the nut *e*, in order that this nut may be held by the dish in tightening up or loosening the connection with the diaphragm by the application of a tool to the hub outside the diaphragm. In order to lessen the liability of
65 this nut *e* sticking in the dish when it ought to be free to move under the fluid-pressure, I make the nut and the polygonal opening of the tapering form illustrated in Fig. 7.

As the valve has its stem threaded into the
70 inner end of the hub of the diaphragm, the valve can be adjusted easily in relation to the diaphragm without changing the tension of the regulating-spring. For this purpose a spindle S, passing through a stuffing-box in
75 the casing, has its inner end squared or of other polygonal form and adapted to a corresponding opening in the back of the valve, Figs. 1, 5, 6, and 7. This spindle is provided
80 on the outside of the casing with a wheel or handle, by turning which the valve may be turned to increase or diminish the opening without changing the tension of the spring. This can be done with great ease, as there is
85 no strain on the thread of the valve-stem by the fluid-pressure or the counteracting spring.

In the constructions shown a hand-wheel W is employed, whereby the device may be used as a stop-valve as well as a regulating
90 and reducing valve.

It will be observed that the regulator of Fig. 1 is shown as arranged with the diaphragm end downward, while in Fig. 7 the regulator is shown as placed horizontally. I do not wish to restrict myself to either of these arrange-
95 ments of the regulator, as the latter may be placed in any position that may be convenient; but either of the positions shown has the advantage that the chamber on the inside of the diaphragm gets more or less filled with water
100 or condensed steam, which acts somewhat in the nature of a dash-pot and prevents the

regulator from "chattering." The same object is attained, however, by constructing the hub of the diaphragm and the neck in which it works so that there shall be a comparatively
 5 reduced annular opening for the passage of the steam to act on the diaphragm.

I claim as my invention—

1. The combination of the casing of an automatic regulator having inlet and outlet ports
 10 and a valve with a diaphragm open to the fluid-pressure and having a hub which carries the said valve, a polygonal nut on the hub to clamp the diaphragm and a part of the casing having a polygonal opening to receive and hold the nut from turning, substantially as set forth.
 15

2. The combination of the casing of an automatic regulator having inlet and outlet ports and a valve with a diaphragm open to the fluid-pressure and having a hub which carries the valve and a polygonal nut for clamping the diaphragm to the hub, the casing having a polygonal opening to receive the said nut, the nut and opening being tapered, substantially as and for the purpose set forth.
 20 25

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

JOHN M. FOSTER.

Witnesses:

ALBERT POPKINS,
 HUBERT HOWSON.