

(No Model.)

2 Sheets—Sheet 1.

J. M. FOSTER.
PRESSURE REGULATING VALVE.

No. 414,975.

Patented Nov. 12, 1889.

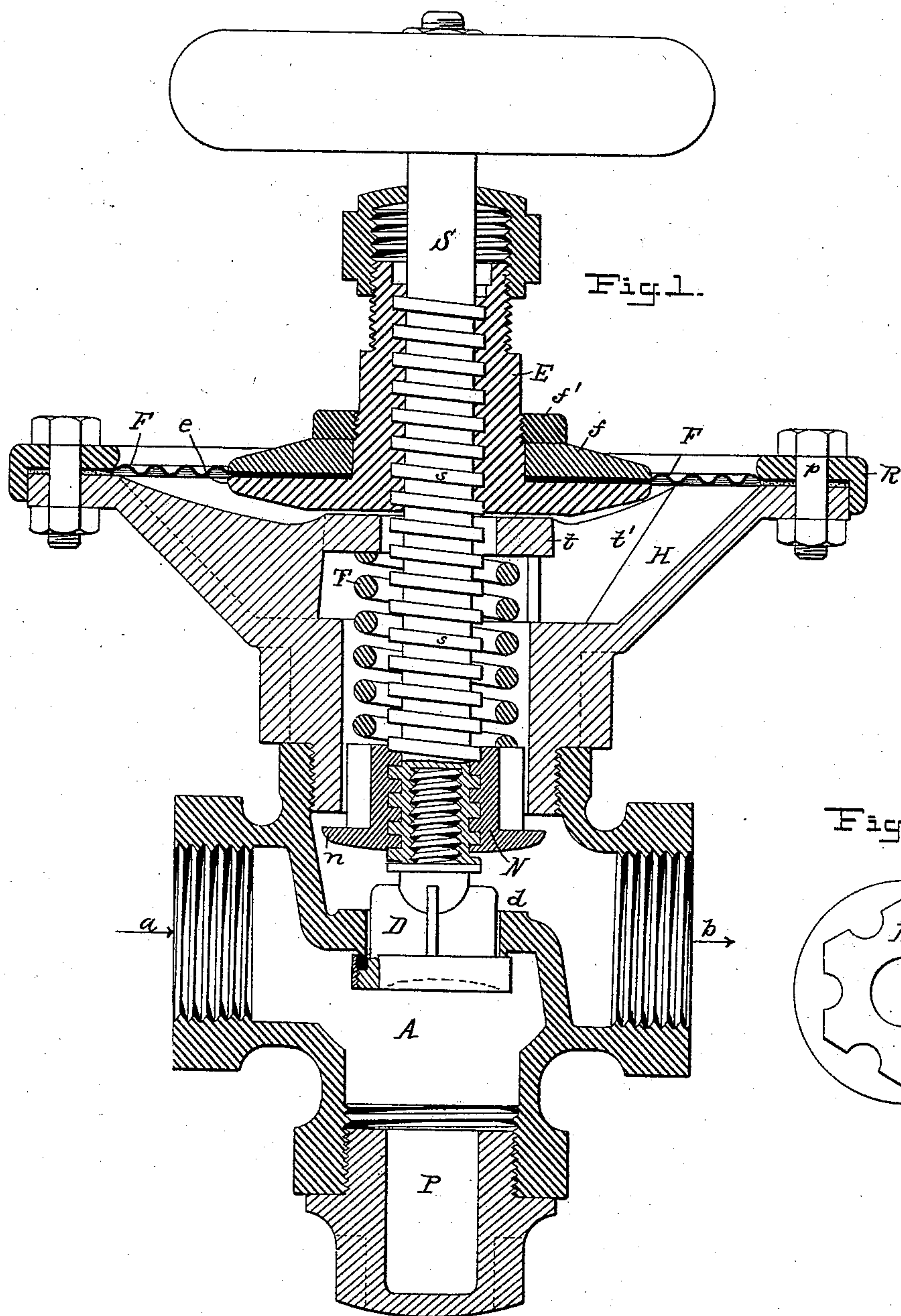
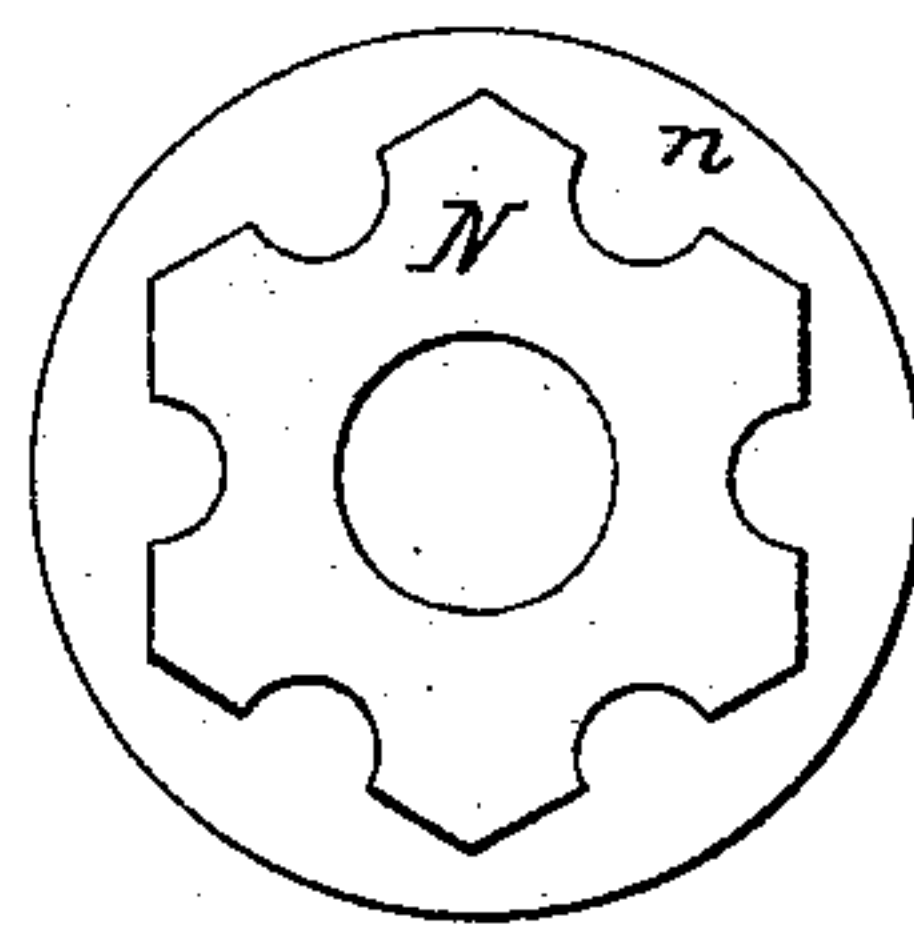


Fig. 1.

Fig. 2.



WITNESSES:

E. J. Griswold
George Baumann

INVENTOR

John M. Foster
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Howson and Howson
his ATTORNEYS

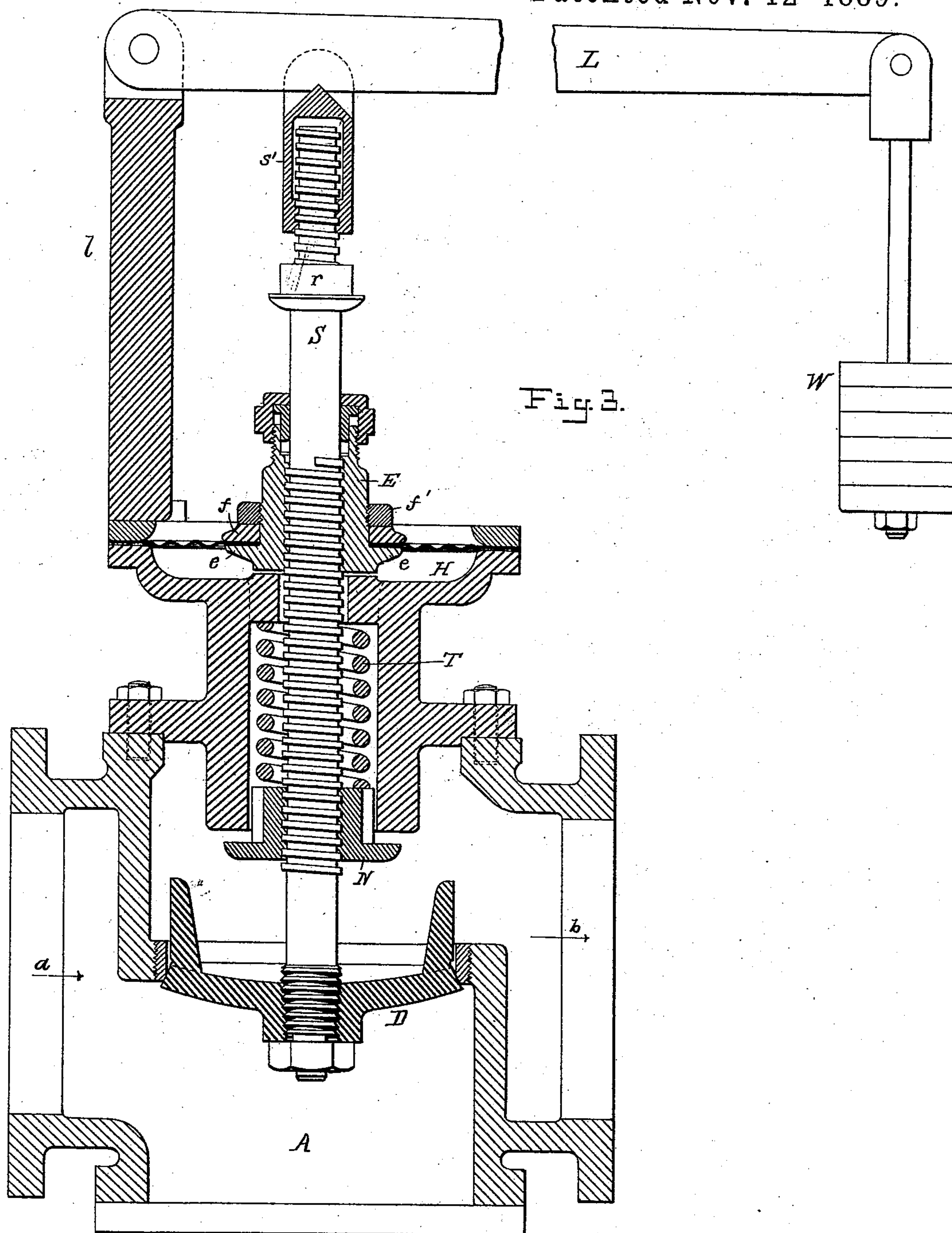
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UNITED STATES PATENT OFFICE.

JOHN M. FOSTER, OF NEW YORK, N. Y.

PRESSURE-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 414,975, dated November 12, 1889.

Application filed October 8, 1889. Serial No. 326,316. (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 New York city, New York, have invented Improvements in Pressure-Regulating Valves, of which the following is a specification.

My invention consists of certain improvements in the combined pressure-regulating valve and governor for which I have obtained Letters Patent of October 30, 1888, No. 391,786.

One of the main objects of my present invention is to so construct the device as to provide a ready and convenient means for adjusting the tension of the spring, and a further object is to prevent excessive lift and possible bulging of the flexible diaphragm.

In the accompanying drawings, Figure 1 is a vertical section of a pressure-regulating valve and governor provided with my improvements. Fig. 2 is a detached plan view of the adjustable nut or collar against which the regulating-spring bears. Fig. 3 is a vertical sectional view showing the application of my improvements to another form of regulating-valve and governor.

Referring to Figs. 1 and 2, A is the valve-casing, with an inlet *a* and an outlet *b*, and with a seat *d* for the valve D. The stem S of this valve is threaded at *s* and adapted to a corresponding thread in the stuffing-box E, carried by the flexible diaphragm F. In the present instance the rim of this flexible diaphragm is secured by a ring R and bolts or screws *p* within the rim of the dish H, which is fitted to the valve-casing and is in effect a part thereof. The stem of the valve may be provided on the outside with a square or a polygonal head for the application of a suitable operating handle or tool, or it may be provided with a hand-wheel or lever-handle. By adjusting this stem the valve D may be brought toward or removed from its seat in proportion to the pressure of steam or other fluid required on the distributing side of the valve. The lower end of this valve-stem is threaded, and this may be a continuation of the thread formed to work in the stuffing-box. Upon this lower threaded portion of the stem is mounted the adjustable collar or nut N, which is constructed so that it cannot turn with the stem, but can move longitudi-

nally therewith. For this purpose, as in my former regulator, the periphery of the nut is made polygonal and adapted to a corresponding opening in the casing. The spiral spring T at its lower end bears upon this nut or collar, and at its upper end bears upon the shoulder *t*, carried by the wings *t'* of the dish or casing.

The operation of the parts described is substantially the same as that described in my above-mentioned patent. In the regulator of my former patent when it was desired, however, to change the tension of the spring T it became necessary to remove the bottom plug P and to unscrew the nut end from the stem after first removing the valve.

By my present invention I provide a simpler way of changing the tension of the spring by making the stuffing-box E, which is carried by the flexible diaphragm, capable of being freed or detached from the diaphragm, so that it can be turned thereon. For this purpose the stuffing-box E is provided with a flange *e*, between which and a ring *f* the diaphragm is clamped by screwing down the nut *f'* upon the exterior of the stuffing-box onto the ring *f*.

When it is desired to change the tension of the spring, the nut *f'* is released, so as to free the stuffing-box from the diaphragm and enable the stuffing-box to be turned independently of the latter. The stuffing-box is then turned in whichever direction it may be necessary to increase or decrease the tension of the spring, and, as the collar or nut N cannot (owing to its confinement within the casing) turn with the stem, the relative distance between the nut and the stuffing-box or collar *t* will be changed as the stuffing-box is turned. The stuffing-box is then firmly re-clamped to the diaphragm simply by screwing up the nut *f'*.

In order to prevent the accidental bulging of or other damage to the diaphragm from turning on the pressure when the valve happens to be screwed down, I provide a projection or projections *n*, preferably in the form of a flange on the lower edge of the nut or collar N to come into contact with the casing if the pressure tends to raise the diaphragm beyond a given limit.

In the modification illustrated in Fig. 3 I have shown my invention as applied to a valve of much larger capacity than that shown in Fig. 1; but my improvements in the two cases are substantially alike. The valve D, carried by the threaded stem which is adjustable in the stuffing-box E in the casing, is of a somewhat different construction from that illustrated in Fig. 1. The nut N, against which the spring T acts, is substantially the same in construction as that already described, and the stuffing-box E in this case also is detachably secured to the diaphragm F by a clamp similar to that described. To assist the spring T, however, I have in this case provided also weights W, suspended from the end of a lever L, pivoted to the upper end of the standard l on the casing. This weighted lever L bears upon the top of a swivel s', which receives the upper threaded end of the valve-stem S. The latter is provided with a square r for the application of a tool to turn it to change the adjustment of the valve.

I claim as my invention—

25 1. The combination of a regulating-valve and casing carrying a diaphragm open to the fluid-pressure and a stuffing-box carried by but detachable from the diaphragm with a threaded valve-stem adapted to the said stuffing-box and a spring bearing on a nut or collar free to move longitudinally with the stem,

but not free to turn therewith, all substantially as described.

2. The combination of a regulating-valve and casing carrying a diaphragm open to the fluid-pressure and a stuffing-box adjustably clamped to the diaphragm with a threaded valve-stem adapted to the stuffing-box and a spring bearing on a nut or collar free to move longitudinally with the stem, but not free to turn therewith, all substantially as described.

3. The combination of a regulating-valve and casing carrying a diaphragm open to the fluid-pressure with a valve-stem carried by the diaphragm and having a nut or collar with a projection or projections to prevent excessive lift of the diaphragm, substantially as described.

4. The combination of a casing carrying a diaphragm open to the fluid-pressure and a valve adjustably mounted in the diaphragm with a spring and an adjustable weight to act upon the valve against the said fluid-pressure, substantially as described.

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

JOHN M. FOSTER.

Witnesses:

EDITH J. GRISWOLD,
JOHN REVELL.