

(No Model.)

J. H. DOUSMAN.
CUT-OFF.

No. 547,483.

Patented Oct. 8, 1895.

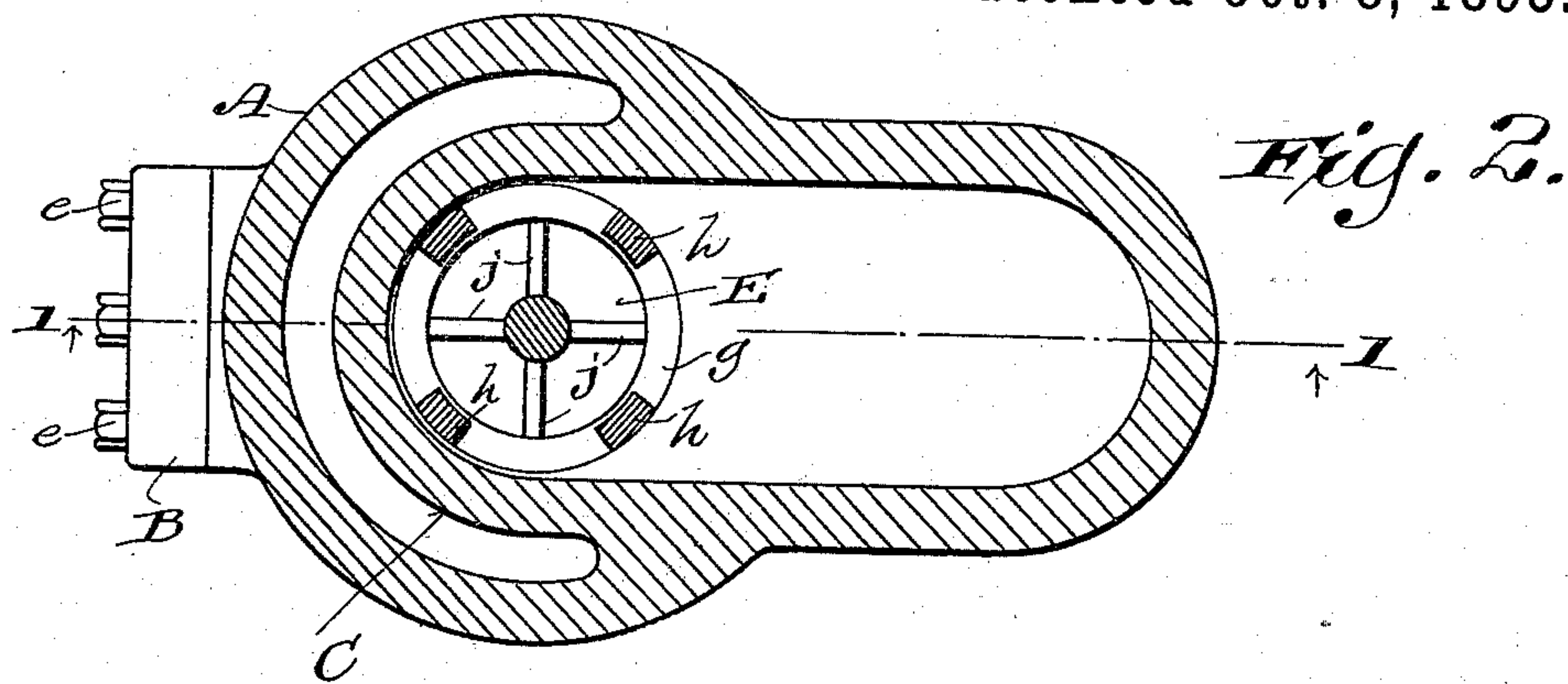
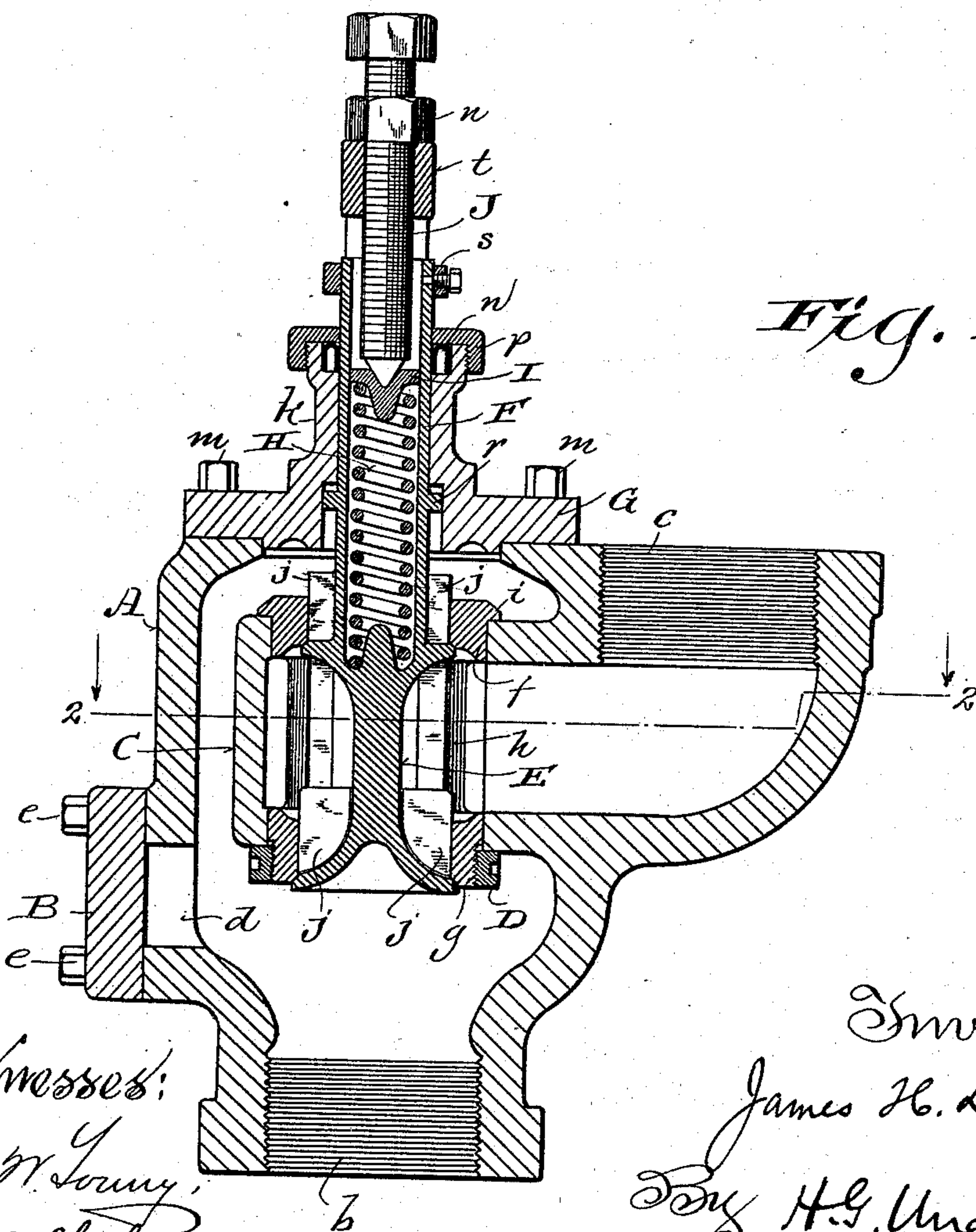


Fig. 1.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

JAMES H. DOUSMAN, OF MILWAUKEE, WISCONSIN.

CUT-OFF.

SPECIFICATION forming part of Letters Patent No. 547,483, dated October 8, 1895.

Application filed December 19, 1894. Serial No. 532,303. (No model.)

...o all whom it may concern:

Be it known that I, JAMES H. DOUSMAN, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Cut-Offs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to provide a simple, economical, and efficient automatic cut-off for use in fluid-circulating systems; and it consists in certain peculiarities of construction and combination of parts hereinafter set forth with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a vertical transverse section taken on line 1 1 of the succeeding figure, illustrating my device as it appears when the valve portion thereof is closed as the result of pressure exceeding a predetermined degree. Fig. 2 represents a horizontal section taken on line 2 2 of the preceding figure.

Referring by letter to the drawings, A represents a casing having two ports *b c*, either of which may be the inlet and the other the outlet, according to the application of my invention. The casing is herein shown as provided with a hand-hole *d*, normally covered by a plate B, held in place by screws *e* or other suitable means; but this structural detail being more of a convenience than a necessity, its omission would in no way affect the general construction and operation of my device.

A transverse chamber C, within the casing intermediate of the ports, has parallel openings for the reception of a cage consisting of apertured heads *f g*, joined by ribs *h*, the latter being arranged at suitable intervals apart. The cage-head *f* has a flange *i*, that overlaps the adjacent wall of the chamber C, and the other cage-head *g* has an exteriorly-threaded portion that extends beyond the chamber and is engaged by a correspondingly-threaded clamping-ring D, that may be operated through the hand-hole *d*, above specified. The inner face of the cage-head *f* and outer face of the cage-head *g* constitute seats for the ends of a valve E, the latter being provided with guide-wings *j*, that work in the apertures of said cage-heads. Extending in one direction from the valve is a hollow stem

F, that has longitudinal movement in a boss *k*, extending outward from a cap G, held on the casing by screws *m* or other suitable means. The boss is provided with a seat for suitable packing *n*, and a gland *p* is in screw-thread engagement with said boss to hold the packing in place. In some instances I prefer to provide the valve-stem with an exterior collar *r* and recess the casing-cap to obtain the necessary clearance for said collar. This collar acts to confine fluid in the adjacent recess coincident with movement of the valve in one direction, and another collar *s*, fast on that portion of said stem outward from the gland *p*, limits movement in of said valve in the opposite direction. A lug within the valve-stem centers a spiral spring H, and a washer I, having a centering-lug depending into said spring, is opposed by a tension-screw J, the latter being adjustable in a yoke *t* on the casing-cap, and, as herein shown, a set-nut *u* may be employed to maintain the tension-screw in adjusted position.

From the foregoing description of the construction and assemblage of parts it will be seen that the casing-cap, cage, and valve may be all withdrawn or placed at one time, the clamping-ring being detached from said cage to permit the desired operation.

When my device is arranged as herein shown, the port *b* of the casing is the inlet and the port *c* the outlet. I also show the valve closed, it being assumed that the fluid-pressure in the casing is greater than a predetermined degree and that the closing of said valve has taken place automatically to cut off the flow through said casing. It is to be observed that within the chamber C the valve is perfectly balanced, and exteriorly the end of said valve toward the port *b* of the casing has a greater area to fluid-pressure than the end from which the stem F extends.

For the purpose of illustrating the working of the valve we will assume that the differential areas are as three to one, that the tension of the spring is twenty-four pounds, and that said valve automatically closed when the fluid-pressure in the circulating system exceeded thirty-six pounds. On this basis it will be seen that when the fluid-pressure became thirty-six pounds on the large area of the valve there was twelve pounds pressure on

the small area and the spring exerting a force of twenty-four pounds, the valve balanced throughout. Therefore when said fluid-pressure exceeded thirty-six pounds on the large area of said valve the pressure on the small area and power of the spring were overcome. Consequently the cut-off or seating of the aforesaid valve was automatically effected.

As herein shown, my device is particularly applicable as a cut-off for laterals of water-mains when the fluid-pressure in these mains increases beyond a predetermined limit, the tension of the spring and the differential valve areas being proportioned to this limit.

By a reversal of the device it may be utilized as an automatic cut-off for a storage-tank when the static pressure therein exceeds a predetermined degree, and in any application of my device the employment of the collar on the stem F will result in the valve being cushioned as it comes on its seats because of a confining of the fluid by said collar in the adjacent recess.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports normally open to both and provided with seats, a valve balanced in the chamber to oppose said seats but having its extremities of differential area to external fluid-pressure, and a suitable spring arranged to exert its power on that extremity of the valve having the least area to said pressure.

2. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports normally open to both and provided with seats, a valve balanced in the chamber to oppose said seats but having its extremities of differential area to external fluid-pressure, and a suitable spring adjustable as to tension arranged to exert its power on that extremity of the valve having the least area to said pressure.

3. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports normally open to both and provided with seats, a valve balanced in the chamber to oppose said seats but having its extremities of differential area to external

fluid-pressure, a hollow stem leading from that extremity of the valve having the least area to said pressure, and a suitable spring in valve-stem.

4. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports normally open to both and provided with seats, a valve balanced in the chamber to oppose said seats but having its extremities of differential area to external fluid-pressure, a hollow stem leading from that extremity of the valve having the least area to said pressure, a suitable spring in the valve-stem, a washer on the spring, and a tension screw opposing the washer.

5. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports, a cage retained in openings in the chamber, an internally balanced valve that seats at its extremities against the cage, a hollow stem extending from one extremity of the valve, and a suitable spring opposing said valve within the stem.

6. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports, a cage having one head thereof overlapping the chamber and its other head extended through the same, a clamping-ring in screw-thread engagement with the latter head of the cage against said chamber, an internally balanced valve that seats at its extremities against the cage-heads, a hollow-stem extending from one extremity of the valve, and a suitable spring opposing the valve within the stem.

7. An automatic cut-off comprising a casing having two ports, a chamber intermediate of the ports normally open to both and provided with seats, a valve balanced in the chamber to oppose said seats, a hollow stem extending from one extremity of the valve, a suitable spring opposing the valve within the stem, and a collar on said stem movable in a recess within the casing.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JAMES H. DOUSMAN.

Witnesses:

N. E. OLIPHANT,
HENRY DANKERT.