

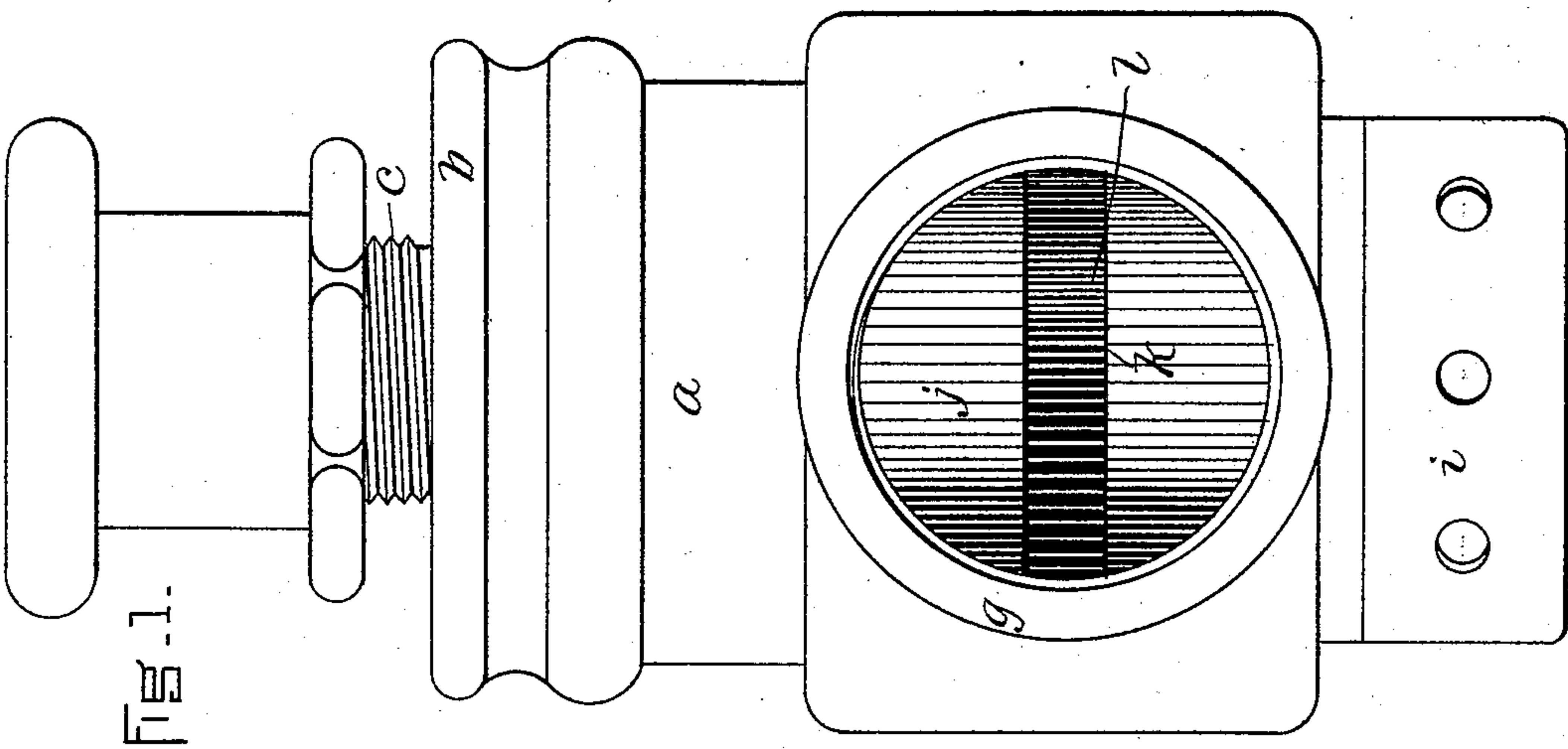
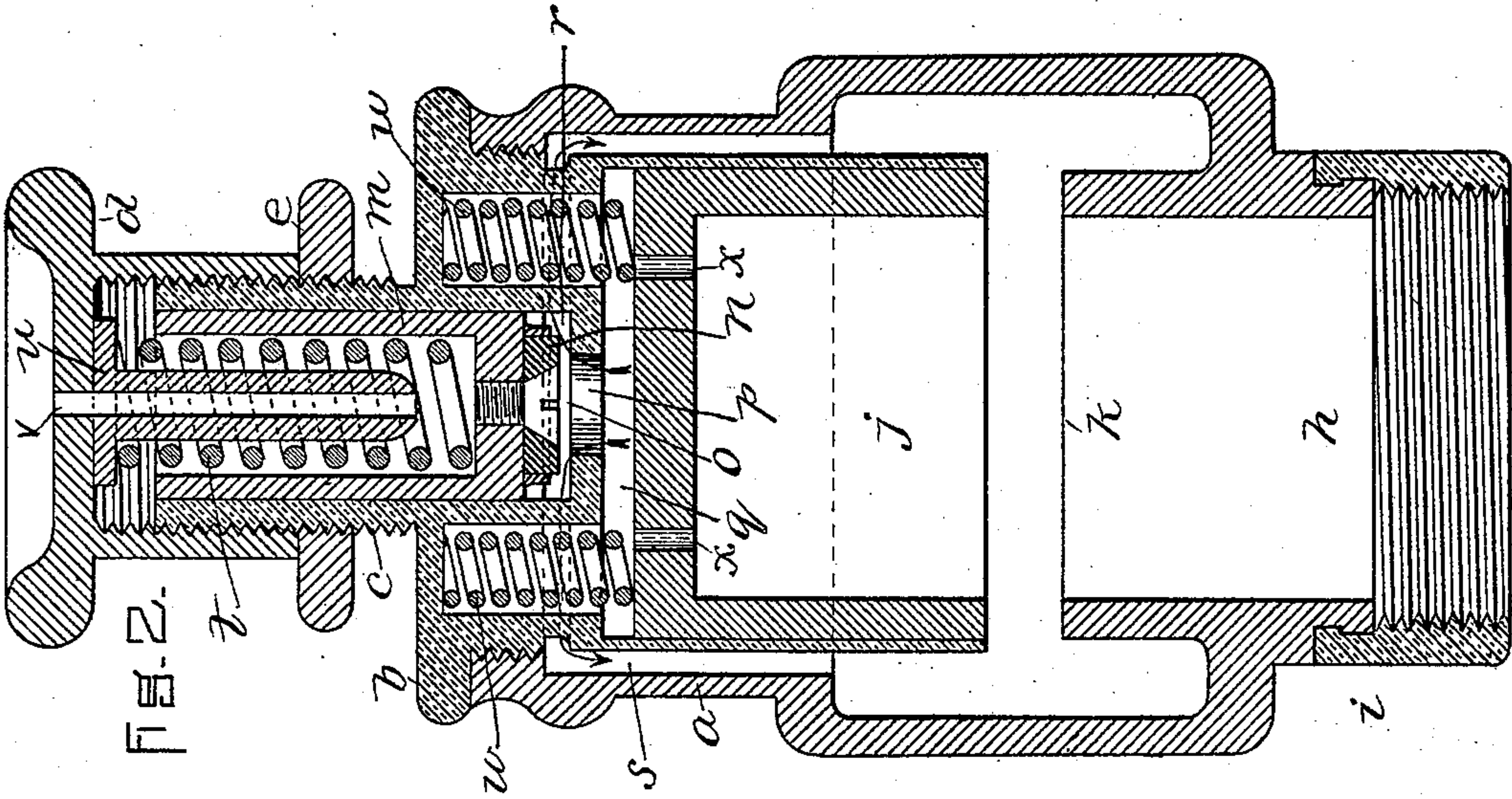
(No Model.)

2 Sheets—Sheet 1.

C. CALLAHAN.
RELIEF VALVE.

No. 487,991.

Patented Dec. 13, 1892.



WITNESSES:
A. D. Harrison.
P. A. McShane.

INVENTOR:
C. Callahan,
by Night, Brown & Henssley,
Attorneys

(No Model.)

2 Sheets—Sheet 2.

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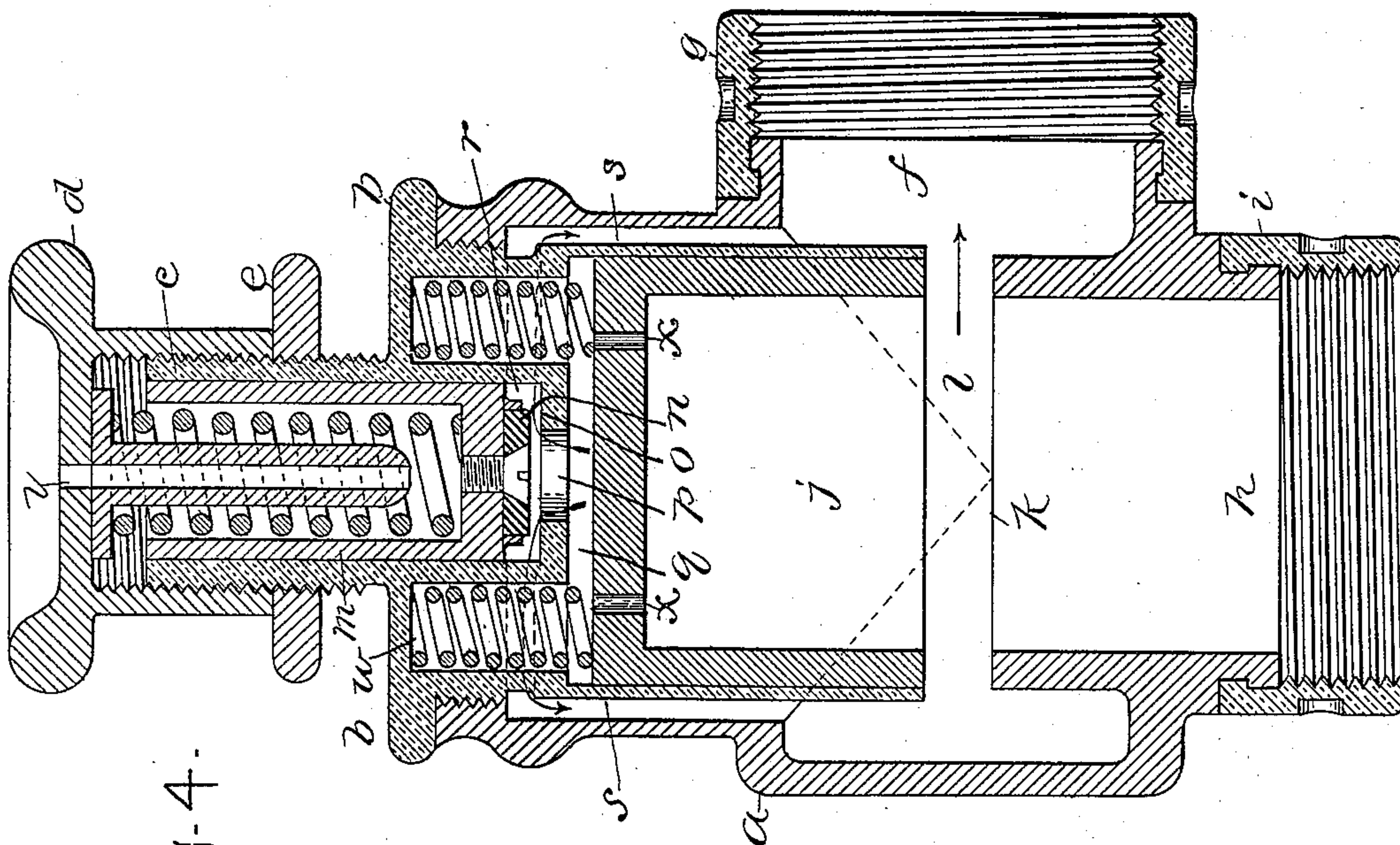


Fig. 4.

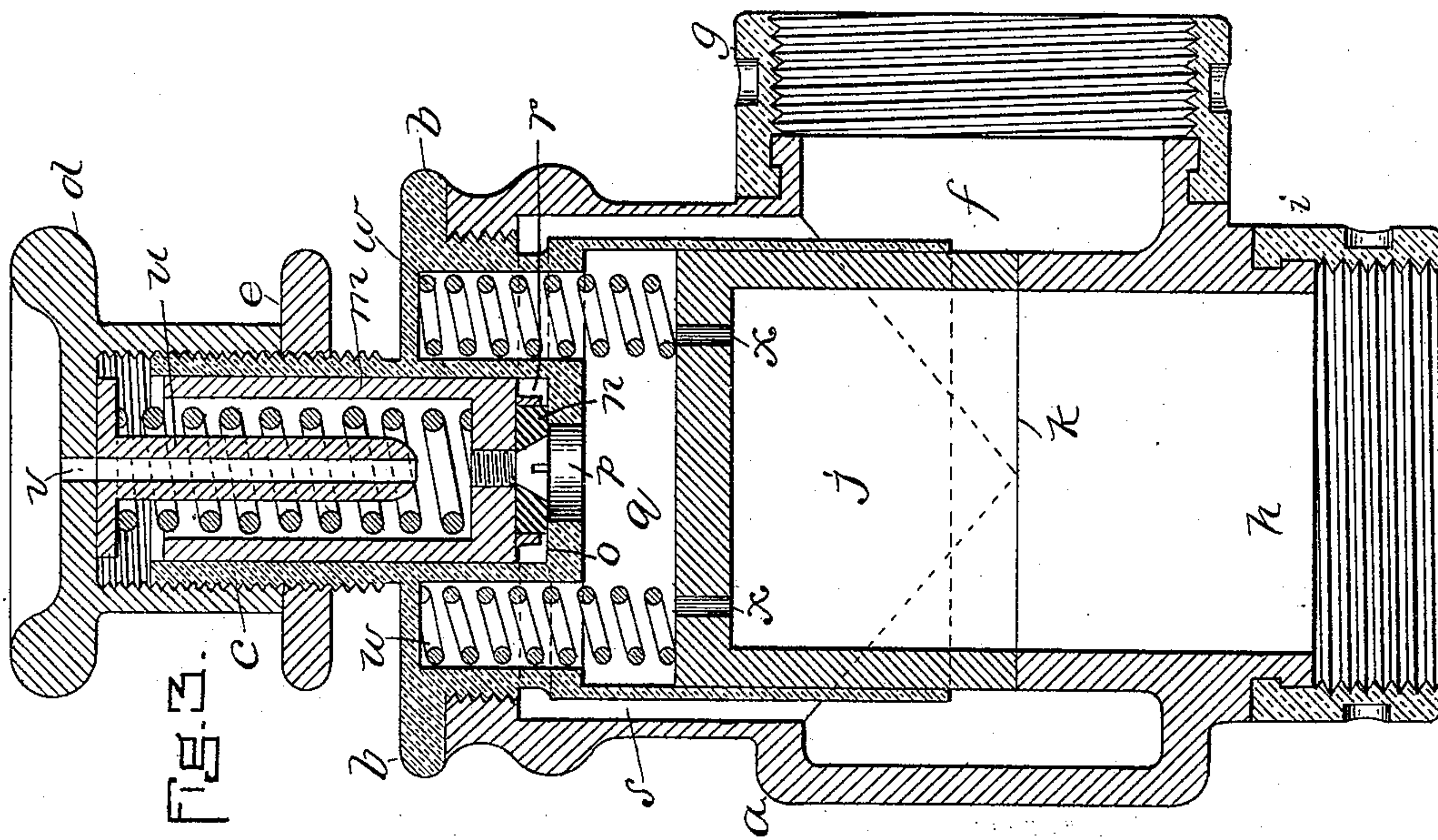


Fig. 3.

WITNESSES:
A. D. Harrison.
B. A. McShane.

INVENTOR:
C. Callahan.
by
Wright, Brown & Grosely,
ATTYS.

UNITED STATES PATENT OFFICE.

CORNELIUS CALLAHAN, OF BOSTON, MASSACHUSETTS.

RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 487,991, dated December 13, 1892.

Application filed January 9, 1892. Serial No. 417,458. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS CALLAHAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Relief-Valves, of which the following is a specification.

My invention relates to valves constructed and arranged to open when a dangerous pressure or shock occurs to allow the escape of water or other fluid; and it is adapted for use upon hydrants and pumps of all kinds, and particularly in connection with steam fire-engines and other contrivances employing shut-off nozzles to stop the flow of water.

It is the object of my invention to provide such improvements in relief-valves as will simplify the construction of the same and render them more efficient and quicker of response to undue pressure or shock than has been the case with relief-valves as heretofore constructed.

To these ends my invention consists of a relief-valve comprising the construction which I will now proceed to describe and claim.

Reference is to be had to the annexed drawings and letters marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

In the drawings, Figure 1 is a side elevation of my improved relief-valve. Fig. 2 is a vertical central sectional view taken from side to side as viewed in Fig. 1, the valves being represented as raised. Fig. 3 is a vertical central sectional view taken on a line running through from the front to rear as viewed in Fig. 1, the valves being shown as having been forced down upon their seats. Fig. 4 is a sectional view similar to Fig. 3, showing valves as in raised position.

In the drawings, *a* designates the outside casing of the valve.

b designates a cap screwed into the top of the casing *a* and provided with an externally-screw-threaded neck *c*, upon which is screwed an adjusting-cap *d*.

e designates a lock-nut, also screwed upon neck *c* below the cap *d* to maintain the latter in place.

f designates the outlet-port, provided with the female coupling part *g*, and *h* designates

the inlet-port, provided with a similar coupling part *i*.

j designates a vertically-movable valve fitted within the casing and adapted when closed or in lowered position to rest upon the annular-valve seat *k*, the construction and arrangement of the valve and its seat being preferably such that when the valve is raised the opening or port between the valve and its seat will be centrally opposite the exit-port *f*, as is represented at *l* in Fig. 1, where the valve *j* is represented as raised, as shown also in Figs. 2 and 4.

m designates a piston fitted within the chamber formed in the neck *c*, so as to be vertically movable therein, and constructed at its lower end as a valve *n*, adapted to rest upon a seat *o* and close or open a port *p*, leading from a chamber *q* to a chamber *r*, which communicates with an annular chamber or opening *s*, the latter in turn communicating with the exit-port *f*. Piston *m* is hollow and contains an adjustable spring *t*, which operates to hold the piston down upon its seat *o*.

u designates a follower, bearing at its upper end against the nut *d*, and between which and the bottom of the piston the spring *t* is adapted to bear, as shown.

v designates a vent or hole formed through the follower *u* and nut *d* to permit of the ready escape and inlet of air when the piston is operated, as will hereinafter more fully appear.

w designates springs bearing at their upper ends upon the cap *b* and resting at their lower ends upon the valve *j*, tending with light stress or strain to force the last-mentioned valve down upon its seat *k*.

x designates ports communicating between the interior of the valve *j* and the chamber *q*, the latter having, as will be seen, a greater water-bearing surface upon the valve than is had from the interior of the latter, so that normally water under pressure being admitted to the contrivance and passing through the ports *x* to the chamber *q* will tend to close the valve *j* or hold the same down upon seat *k* until the pressure in chamber *q* should be sufficient to overcome the stress exerted by the spring *t* upon the piston *m*, when the said piston will be raised, and the water flowing

into the chamber *r*, annular chamber *s*, and out through the exit-port *f* will relieve the pressure in chamber *q*, and so allow the valve *j* to be raised from the position in which it is represented in Fig. 3 to that in which it is shown in Fig. 4 and permit the water to flow freely through the exit-port *f*.

In use the cap *d* will be adjusted so as to hold the piston down upon its seat with the required force. If, however, the pressure of the water in the contrivance against the valve *j* should be unduly great—as, for example, when the valve is used in connection with the fire-engine—and the pumps are at work and the discharge-nozzle of the hose suddenly shut off, the pressure-water in the chamber *q* will become sufficient to raise the piston *m*, relieve the pressure in said chamber *q*, as before explained, and permit the valve *j* to be raised by the pressure of the water, allowing the latter to flow out through the exit-port *f* upon the street or be returned back into the suction-chamber.

It is obvious that various changes may be made in the form and construction of parts comprising my invention without departing from the nature or spirit thereof.

Having thus described my invention and set forth a way of making and using the same, though without attempting to explain all the forms in which it may be made and all of its modes of use, I declare that what I claim is—

1. A relief-valve comprising in its construction an inlet-port and an exit-port, a valve to control the exit-port, a chamber *q* outside

of the said valve having a water-bearing surface on the valve of greater area or extent than the water-bearing surface on the interior or reverse side of the valve, a piston-chamber communicating with the said exit-port and containing a spring-pressed piston, a port leading from the interior of the valve to the chamber *q*, a port leading from the said chamber *q* to the piston-chamber, a valve carried by said piston for closing the last-mentioned port, and springs bearing upon the controlling-valve, as set forth.

2. A relief-valve comprising in its construction an inlet-port and an exit-port, a valve *j* to control the exit-port, a chamber *q* above said valve having a water-bearing surface on the valve of greater area or extent than the water-bearing surface on the lower face of the valve, ports *x*, leading from the lower surface of the valve to the chamber *q*, a chamber *r*, communicating with the exit-port, a port *p*, communicating with the chambers *q* and *r*, a valve constructed and arranged to control the port *p*, an adjustable spring bearing on the valve, and springs *w*, arranged to bear upon the valve *j* and hold the same normally down upon its seat, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 19th day of December, A. D. 1891.

CORNELIUS CALLAHAN.

Witnesses:

WM. B. PUDER,
JOHN F. CULLUM.