(No Model.)

A. S. THOMS.

RELIEF VALVE.

No. 480,528. Patented Aug. 9, 1892.

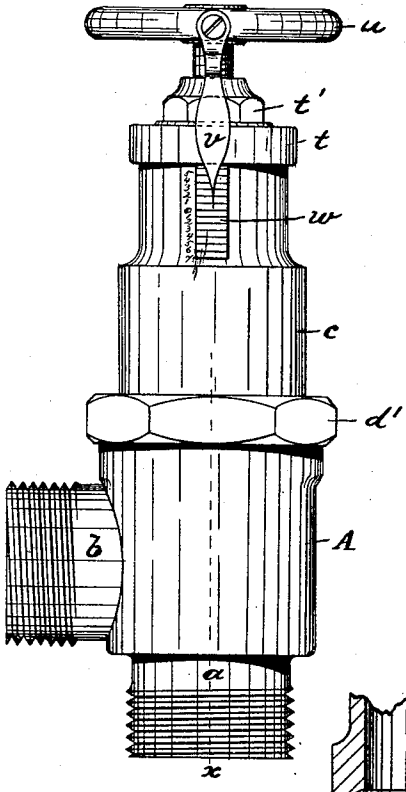

Fig. 1.

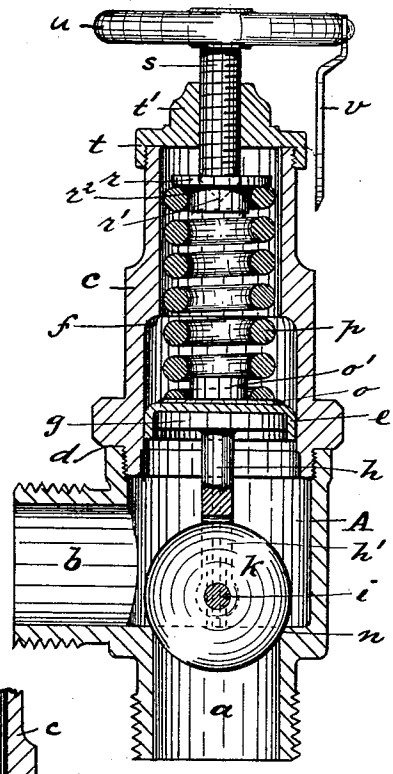

Fig. 2.

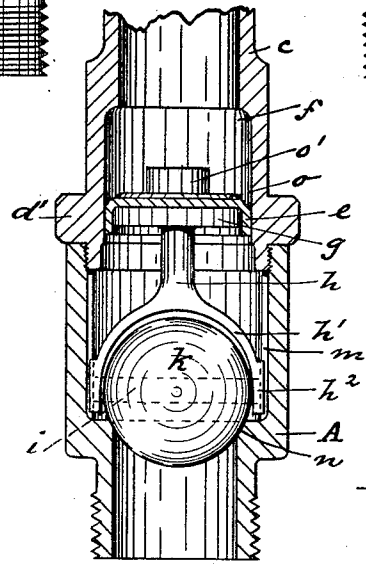

Fig. 3.

WITNESSES:

Wm. D. Bell

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ATTORNEYS

UNITED STATES PATENT OFFICE.

ALEXANDER S. THOMS, OF PATERSON, NEW JERSEY.

RELIEF-VALVE.

SPECIFICATION forming part of Letters Patent No. 480,528, dated August 9, 1892.

Application filed March 18, 1892. Serial No. 425,490. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER S. THOMS, a citizen of the United States, residing in Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Relief-Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a convenient and reliable valve for relieving and regulating the pressure of water, more especially in the pumps of a steam-engine, easily and readily applied to any engine, simple in construction, and not liable to get out of order.

The invention consists in the improved valve and pressure indicator, and the combination and arrangements of the various parts thereof, substantially as hereinafter described, and finally embodied in the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a side elevation of the valve, showing the indicating mechanism. Fig. 2 is a vertical transverse section with the hand-wheel turned one-quarter around, showing the indicator; and Fig. 3 is a detail view on line x, showing in section the valve mechanism, the ball-valve being shown in full.

In said drawings, A indicates a chamber with inlet-pipe connection b and outlet-pipe connection a, made integral therewith and threaded on their outside peripheries. The inlet b is connected to a branch of the discharge-port and the outlet a to a branch of the suction part of the pump. The upper part of the valve-chamber is threaded on the inside to receive the lower threaded end of a shell or casing c. This shell is provided with an annular shoulder d, adapted to fit and rest upon the upper part of the valve-chamber, the outer surface of the annular shoulder being polygonal, as shown at d', Fig. 1, to receive a wrench. Within the lower part of the shell c is arranged and adapted to reciprocate an annular cup-shaped plunger e, the extent of motion of said plunger in the shell being limited by an inner annular shoulder f. Within the hollow portion of the plunger e is closely fitted a circular disk g, secured to or made integral with a valve-stem h. The lower end of this valve-stem is forked, the ends of the prongs h' of said fork being provided with holes to serve as bearings for a spindle i. To this spindle is secured or made integral therewith a ball-valve k, adapted to revolve with said spindle in its bearings. Upon the outer surface of the prongs h' are formed elongated lugs or guides h^2, adapted to fit and be reciprocated in corresponding slots m on the inside of the valve-chamber, as shown in Fig. 3. The diameter of the ball-valve is a little larger than the diameter of the outlet connection, and a valve-seat n of less area than the plunger e is arranged on the inside of the valve-chamber, as shown in Figs. 2 and 3, (when the valve is closed.) On the top of the plunger e rests a disk o with central upward projection o'. Outside of this projection and resting upon the disk o is a spiral spring p, extending upward within the shell c, as shown in Fig. 2. Upon the top of the spring p rests a disk r with downward extension r' within the spring p, the disk and extension being centrally and conically socketed, as shown at r^2, to receive the lower conical end of a threaded spindle s. The top of the shell c is threaded on the outside to receive a threaded inclosing cap t, with upwardly-extending shoulder t', this cap and shoulder being provided with a central threaded hole to receive the threaded spindle s. Upon the top of said spindle is secured a hand-wheel u, to the outer periphery of which is secured in any desired manner an indicator or pointer v, adapted to rest opposite a graduated scale w when the hand-wheel is turned into the proper position.

The scale w is preferably graduated from the center or zero-line in both directions, as shown in Fig. 1, and when the point of the indicator is at the zero-mark on the scale it represents a normal or average pressure of the water on the valve. The pressure on the valve can be regulated by turning the hand-wheel to the right or left, and the said pressure must be such that it equals the pressure of the pump.

When the pump is in operation and the dis-

charge open, the water enters the pump through its suction-pipe and from there is forced through the discharge or hose connection pipe without passing through or operating the valve. Should the discharge from the hose connection be shut off, the water in the pump immediately enters through valve-inlet *b* into the valve-chamber and acts on the plunger *g*, whereby the ball-valve *k* is raised and the water allowed to pass through outlet *a* into the suction-pipe of the pump, thence into the pump, thus preventing the pump from jarring or running away as the engine is churning the water in the pump at the previous working pressure.

As already stated, the pressure in the valve has to be equal to the pressure in the pump, and this is effected by turning the hand-wheel *u* to the right or left until its indicator *v* rests with its lower pointed end opposite a graduation-mark on the scale *w*, which corresponds in valve to the mark which the hand on the pump-gage indicates.

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

In a relief-valve, the combination, with the valve-chamber A, provided with inlet *b* and outlet *a*, arranged at right angles to each other, a valve-seat arranged in the valve-chamber and surrounding the inner opening of outlet *a*, a shell *c*, secured to the top of said valve-chamber and opposite to the outlet-pipe *a* and provided with an inner annular shoulder *f*, a cap *t*, secured to the top of said shell, a plunger *e*, adapted to be operated in said shell by the pressure of the inflowing water and limited in its up motion by said annular shoulder, a stem *h*, secured to the said plunger and provided at its lower end with a fork or yoke *h'*, guiding-lugs on the prongs of said fork, recesses *m m*, arranged on the inside of valve-chamber A, integral therewith and parallel to the motion of the stem *h*, a ball-valve, of considerably larger diameter than the valve-seat, pivotally secured to the fork *h* and adapted to rest on said valve-seat, thus closing close the outlet *a*, and when in operation to revolve in said fork, a spiral spring arranged in shell *c*, and adapted to control the said ball-valve, and a screw provided at its outer end with a hand-wheel and at its lower or inner end with a disk pressing on said spiral spring, said screw being adapted to control said spiral spring, all said parts being arranged and combined to operate substantially as described, and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of March, 1892.

ALEX. S. THOMS.

Witnesses:
ALFRED GARTNER.
WALTER THOMPSON.