

(No Model.)

W. J. GREGG.
STEAM TRAP.

No. 537,973.

Patented Apr. 23, 1895.

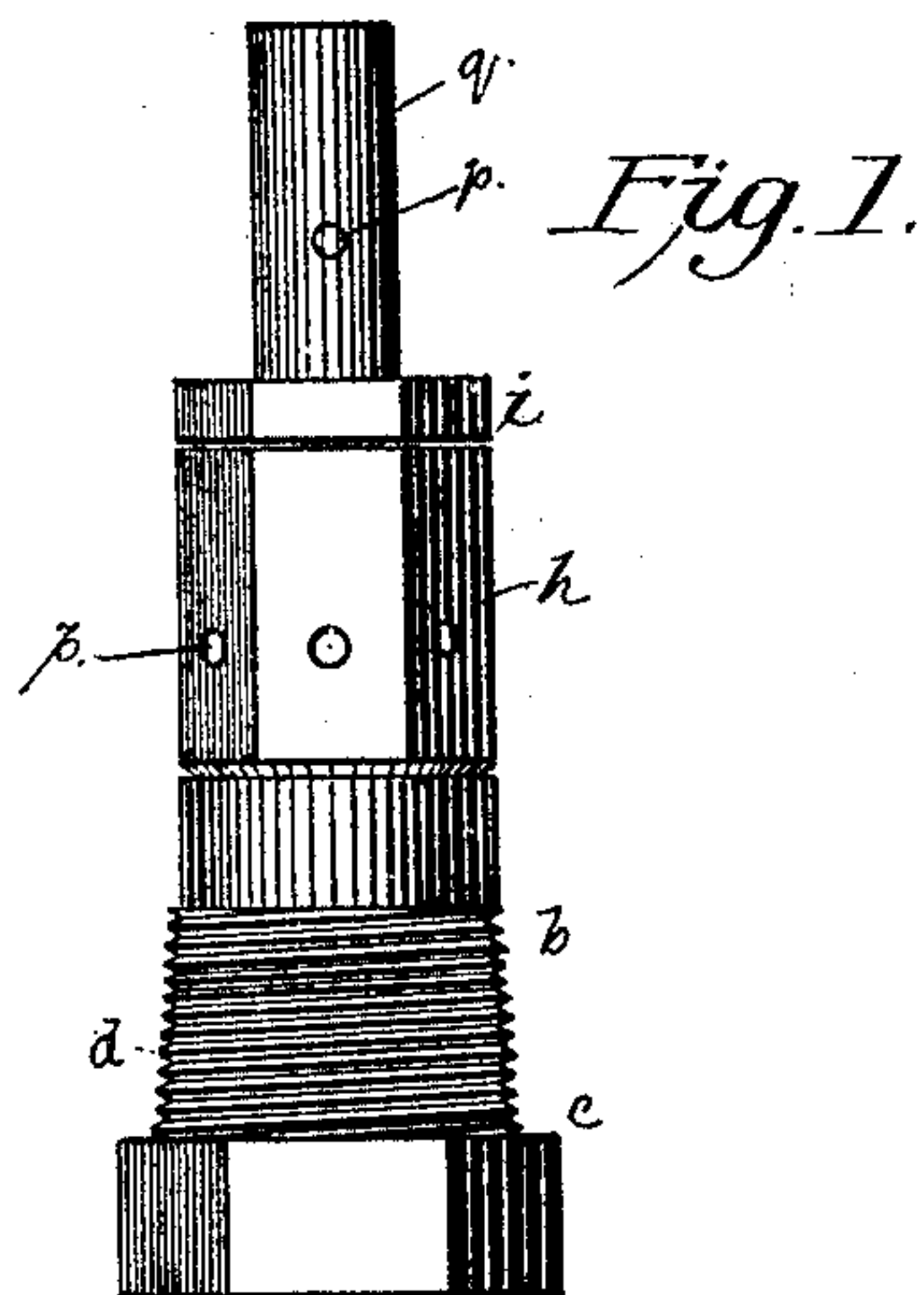


Fig. 2.

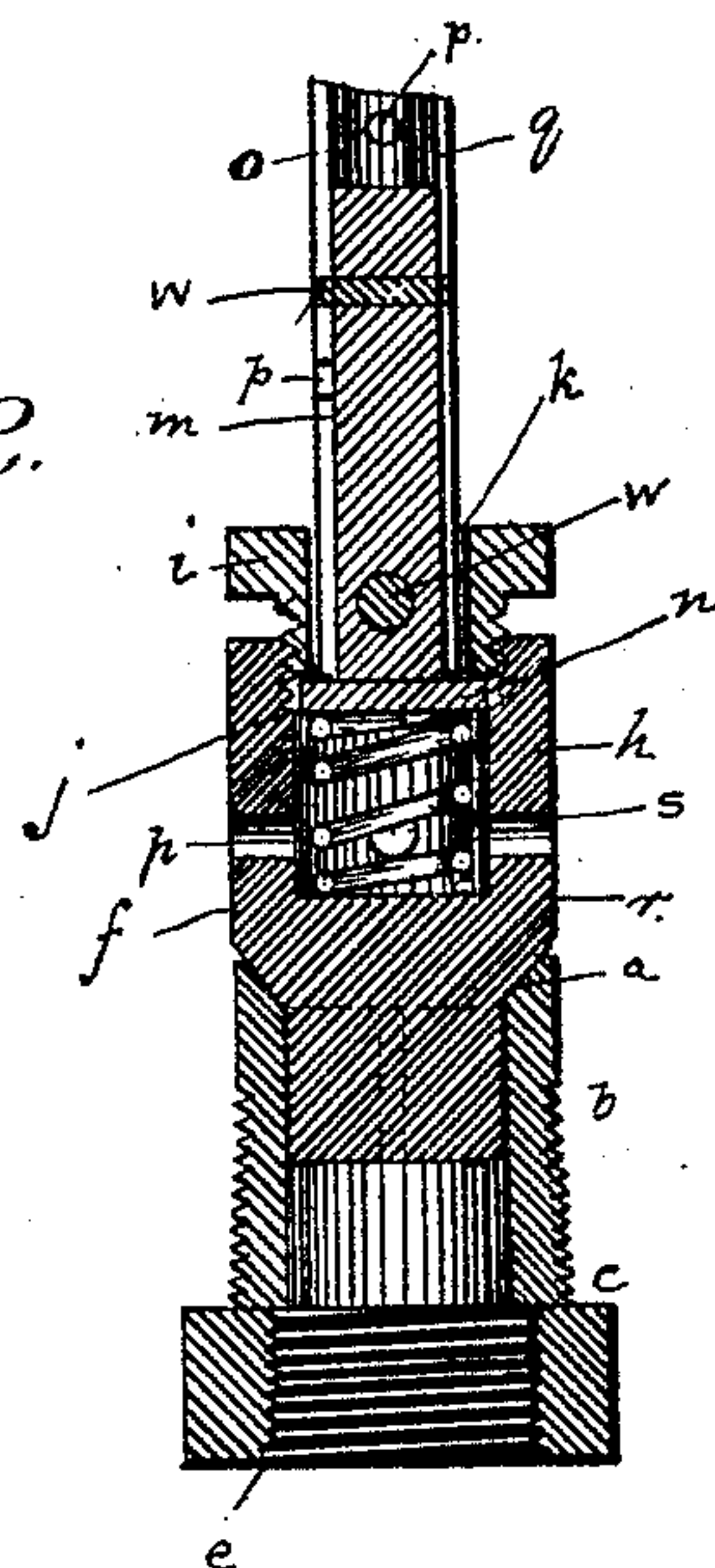
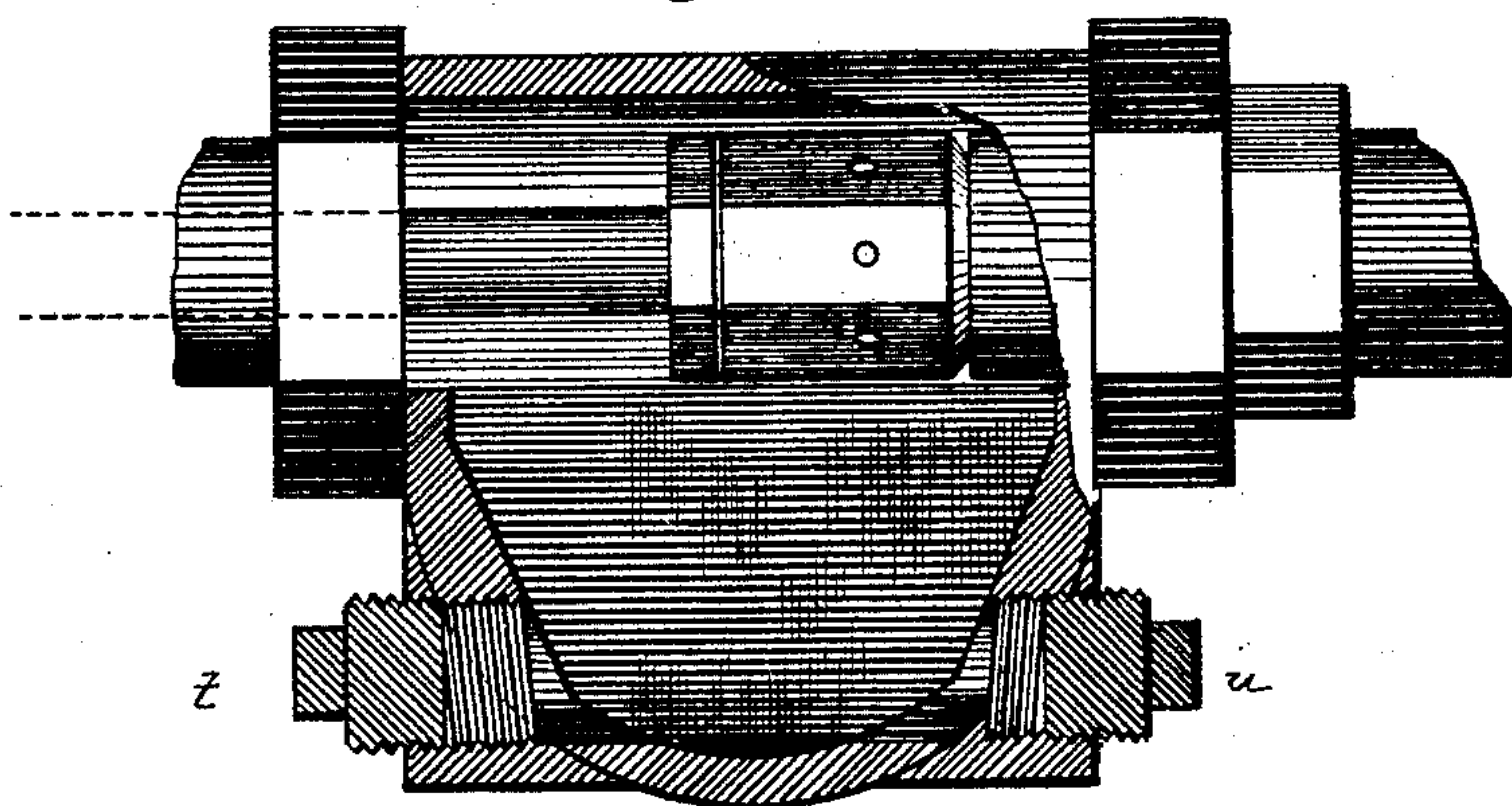


Fig. 3.



WITNESSES.

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STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 537,973, dated April 23, 1895.

Application filed December 7, 1894. Serial No. 531,133. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. GREGG, of the city of Laconia, county of Belknap, and State of New Hampshire, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

My invention relates to and embodies improvements upon the contrivance shown and described in United States Letters Patent No. 509,846, granted to me on November 28, 1893.

The invention in said Letters Patent consists of an automatic means for venting steam pipes or conduits when the steam pressure falls below a predetermined point, so that when the steam is shut off, and before the pressure of the steam in the pipe or conduit is entirely gone, an outlet will be automatically provided for the water of condensation, thus preventing any sufficient accumulation of water in the pipe to obstruct or injure the same by freezing; also to provide a settling chamber to receive the sediment carried by the water of condensation in a steam pipe, and means of discharging such sediment therefrom. Experience has demonstrated that so far as the automatic venting of steam pipes or conduits by said device is concerned it works well in the accomplishment of its object. The sediment chamber also works well for the purposes for which it was designed, but when a greater pressure or temperature of steam is admitted, than that at which the device is adjusted to work, and the expansion of the valve rod exceeds that due to said point of adjustment, said rod or said valve, or said valve seat is liable to become injured. I have found that the difficulties recited are entirely overcome by providing said valve rod with a relief spring, and relief spring chamber, into which chamber said rod may slide by closing together the spring therein sufficiently to compensate for the excess of expansion of said rod, due to any degree of expansion in excess of that at which said device is set to operate normally.

My present invention for which I now seek a patent is shown in the drawings hereto annexed, and I have hereinafter described said invention and said drawings, the same letters designating the same parts or features, as the case may be, wherever they occur.

In the drawings, Figure 1 represents an elevation of the valve, spring chamber, and part of the expanding rod. Fig. 2 represents a section through center of Fig. 1. Fig. 3 represents a section through the sediment chamber showing trap in position.

The outside casing is not shown in the drawings, forming part of this specification as it is fully shown and described in said prior patent.

a, represents the valve seat and is made cylindrical in shape the upper part being of smaller diameter than the outer casing for about one third of the distance from the top of this valve seat, to allow of a free space between the interior of the outer casing and the exterior of said valve seat. From the lower part of this smaller part, and for a distance, say about one third of the spring chamber, (shown on the drawings from *b*, to *c*,) I make a threaded part to receive, and screw into the outside casing in uniting the two together. This threaded part I make conical shaped, as shown at *d*, on the drawings so as to make closer the fit as the spring chamber of the valve seat is screwed into the outer casing. On the inside of the lower part of said valve seat I cut a thread as shown at *e* to receive any lengthening out of the waste or discharge outlet of said device. The valve *f* being made to properly fit, said valve seat *a* has as a part thereof, and extending above the valve proper, a spring chamber *h*. The top of said spring chamber has a gland *i* fitted to screw into said chamber, the top part of said gland *i* forming a cap of same outside diameter as the top of said chamber, while the inside diameter of said gland *i* is larger than the inside diameter of said chamber *h*, forming a shoulder as shown at *j* on the drawings. There is extending through said gland *i* a hole *k* large enough for the expansion rod *q* to pass freely through. A plug *m* with a head *n* thereon is fitted into said expansion rod (said rod being hollow) as shown at *o* and is rigidly secured therein by pins *w* passing through said rod and plug. The head of said plug *m* is made smaller than the inside diameter of the spring chamber *h* but larger than the inside diameter of the hole through the gland *i* so that when the head of the plug *m* is to come in contact with said gland *i* it carries said gland,

spring chamber, and valve with it, the same distance that the rod *q* contracts, and thus to the same degree lifts said valve from its seat, thereby forming an opening for the condensed water and steam to escape.

Within the spring chamber *h* and between the plug *m* and the top of the valve proper *r* I place a spring *s* which is so adjusted as to keep the plug *m* and expansion and contraction rod *q* against the gland *i* at all times when the pressure and temperature of said rod *q* are at the normal degree at which the trap is set to operate, but when the pressure and temperature exceed this predetermined degree at which the trap is adjusted and set, or when any foreign substance lodges between the valve and its seat, which would cause injury to said rod *q* or valve or valve seat said spring *s* yields enough to prevent said injury.

The sediment chamber shown at Fig. 4 of the drawings is made with openings *t, u*, at each end thereof which enable me to more readily remove the plugs *t u* therefrom when necessary for cleaning when the side of the sediment chamber is close to any wall.

The expansion rod and spring chamber are vented by making holes *p* therein for the purpose of allowing the steam to circulate freely inside and outside of the same, and also to allow any water collecting therein to freely escape. These holes also equalize the pressure within the spring chamber, thereby preventing the chattering of the valve on the valve seat.

The operation of my said device is as follows: The trap is adjusted and set to open and close at a given degree of temperature by means of the contraction and expansion of the rod *q* as is so fully shown and described,

as to its parts and operation, in my said Letters Patent No. 509,846, of date November 28, 1893, and is so well understood by mechanics skilled in the art that a full repetition thereof is herein unnecessary. The operation of this my improvement is as follows: When a degree of pressure or temperature greater than that at which the trap is adjusted and set to operate acts upon said rod *q* it compresses said spring *s*, and allows said rod to slide into said spring chamber, and thus overcome any injury to said rod *q* which would occur if its two ends were rigidly confined under such excess of expansion. When said rod *q* contracts it slides out of spring chamber *h* until the head of the plug *m* comes in contact with said gland *i* without releasing said valve from its seat. Any further contraction of said rod *q* will open or lift said valve from its seat as designed by its normal adjustment and setting. The same conditions would happen if any obstruction should exist between the valve and valve seat.

What I claim is—

1. The valve constructed with the spring chamber thereon, having the gland cap or head thereon, combined with the spring and the expansion and contraction rod with the headed plug therein as and for the purposes shown and described.

2. The valve with its spring chamber thereon having holes therein, with the expansion rod, and valve seat, as and for the purposes stated.

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Witnesses:

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