

No. 676,399.

Patented June 11, 1901.

J. H. PEARSON.
RELIEF VALVE FOR ENGINES.

(Application filed Oct. 27, 1900.)

(No Model.)

Fig. 1.

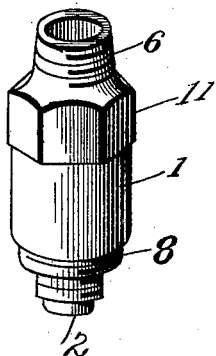


Fig. 2.

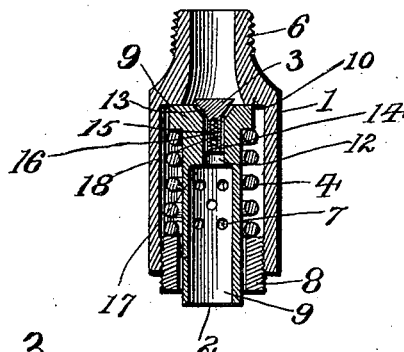


Fig. 3.

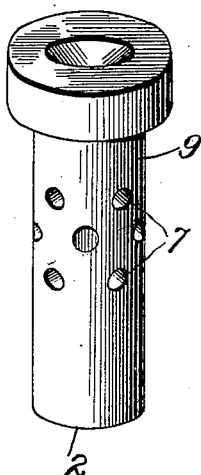


Fig. 4.

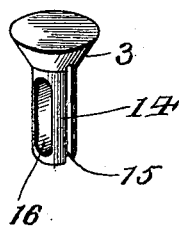
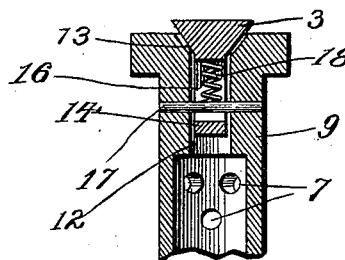


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

JAMES H. PEARSON, OF WORTHINGTON, INDIANA, ASSIGNOR OF THREE-FOURTHS TO THOMAS C. OWANS, ISAAC BILDERBACH, AND ABRAHAM L. MILAM, OF SAME PLACE.

RELIEF-VALVE FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 676,399, dated June 11, 1901.

Application filed October 27, 1900. Serial No. 34,657. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. PEARSON, a citizen of the United States, residing at Worthington, in the county of Greene and State of Indiana, have invented certain new and useful Improvements in Relief-Valves for Steam-Engine Cylinders; 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.

This invention provides novel means for automatically relieving the cylinder of a steam-engine of an excess of priming or overflow water when steam is on and of water of condensation due to a leaky throttle or other cause when steam is off, thereby preventing the usual casualties attributable to either or both of these causes.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and the drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the device. Fig. 2 is a vertical central section. Fig. 3 is a perspective view of the main valve. Fig. 4 is a perspective view of the auxiliary valve. Fig. 5 is a detail section of the upper portion of the main valve with the auxiliary valve in position and taken at a right angle to Fig. 2.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The body 1 of the device is hollow and constitutes a casing for the operating parts and is formed with a threaded end or extension 6, by means of which attachment is had with the cylinder of a steam-engine or other part to which the contrivance may be applied. The opposite end of the body or casing is open and internally threaded to receive a set-nut

8, which is adjustable to vary the tension of a spring 4, by means of which the valve 9 is normally held seated. The set-nut 8 is adapted to be turned by means of a wrench, spanner, or kindred tool and is formed centrally with an opening to receive the stem 2 of the valve 9 and constitutes a guide therefor. The inner shouldered end 10 of the body or casing 1 constitutes a seat for the valve 9.

In order to facilitate the turning of the body or casing 1 when feeding it to the engine-cylinder or removing it therefrom, said body is formed with a plurality of faces 11, approximating the outline of a nut, and to which a wrench or spanner is adapted to be fitted when required.

The valve 9 may be of any form and is of the puppet type, its stem 2 being tubular and formed in its side with a series of openings 7. The spring 4 is mounted upon the stem 2 and is confined between the valve 9 and the set-nut 8 and normally exerts a pressure to hold the valve seated against the pressure of the steam. The valve is prevented from lateral play and caused to seat itself squarely by means of the set-nut 8, which constitutes a guide therefor, the stem 2 passing through the opening in said nut and being directed in its reciprocating movements thereby. The valve 9 is centrally perforated or bored, as shown at 12, the bore communicating with the opening or space of the stem 2. The upper end of the bore 12 is flared or otherwise fashioned to form a seat 13 for a valve 3, whose stem 14 passes into the bore 12 and is longitudinally channeled, as shown at 15, to provide passages for the escape of water of condensation when the valve 3 is unseated. A diametrical slot 16 is formed in the stem 14 and receives a pin 17, which prevents displacement of the auxiliary valve and forms a point of resistance for a light spring 18, by means of which the valve 3 is normally held unseated. The ends of the pin 17 are seated in openings formed in the valve-stem 2. The spring 18 of the coil type is located in the diametrical slot 16 and is confined between the pin 17 and the upper closed end of said slot and serves to hold the auxiliary valve

open when steam is shut off from the cylinder, thereby providing a free escape for any water of condensation resulting from a leaky throttle or other cause.

5 As stated, the auxiliary valve 3 is open when steam is off, thereby enabling any water tending to collect in the cylinder to readily pass off; but the instant steam is turned on the pressure of the spring 18 is overcome and
10 the valve 3 closed, thereby preventing any waste or escape of steam. When the priming-water or overflow collects in the cylinder to a dangerous or objectionable degree, the valve 9 is unseated by the combined action of the
15 steam and the accumulated water, and the latter passes by the valve into the body or casing 1 and from thence through the opening 7 into the tubular stem 2 and out. When the cylinder has been relieved, the spring 4
20 reacts and seats the valve 9, which operation takes place at a moment to prevent the escape of steam.

The action of the device in relieving the steam-engine cylinder is entirely automatic,
25 and when steam is off a direct escape is provided through the stem 2 by means of the auxiliary valve 3, and when steam is on the auxiliary valve 3 is seated and a by-pass is formed around said valve in the manner aforesaid.
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Having thus described the invention, what is claimed as new is—

1. In an automatic relief for steam-engine cylinders and the like, a body or casing, and
35 a valve located therein and normally seated against the pressure of steam and having a tubular stem in communication at its outer end with the open air and provided in its side within the casing with a series of openings,
40 as and for the purpose set forth.

2. An automatic relief for steam-engine cylinders and the like, consisting of a casing, a valve located therein and having a tubular stem formed in its side with a series of openings and having communication with the open
45 air, a set-nut constituting a guide for the tubular valve-stem, and a spring for normally holding the valve seated and adapted to have its tension varied by means of the said set-screw, substantially as specified.
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3. In an automatic relief for steam-engine cylinders and the like, a hollow body, a valve located therein and normally seated against the steam-pressure and having a tubular stem opening into the air and provided in its
55 sides with a series of openings, a guide completely closing the space between the valve-stem and the outer end of the said body and forming a guide for the valve, and a supplemental valve fitted to the main valve and
60 normally unseated and adapted to close by steam-pressure, substantially as described.

4. In an automatic relief of the character described, and in combination with the main valve having a tubular stem and an opening
65 or bore, an auxiliary valve having its stem formed with a diametrical slot, a pin passing through the slot of the auxiliary valve and having its ends seated in the stem of the main valve, and a spring located in the slot of the
70 auxiliary valve and confined between an end of said slot and the aforesaid pin and adapted to normally hold the auxiliary valve unseated, substantially as specified.

In testimony whereof I affix my signature
75 in presence of two witnesses.

JAMES H. PEARSON. [L. S.]

Witnesses:

C. E. NOTTER,

AUTHOR PALMER.