(No Model.)

J. WHEELOCK.

RELIEF VALVE FOR ENGINE CYLINDERS.

No. 269,978. Patented Jan. 2, 1883.

Fig. 1.

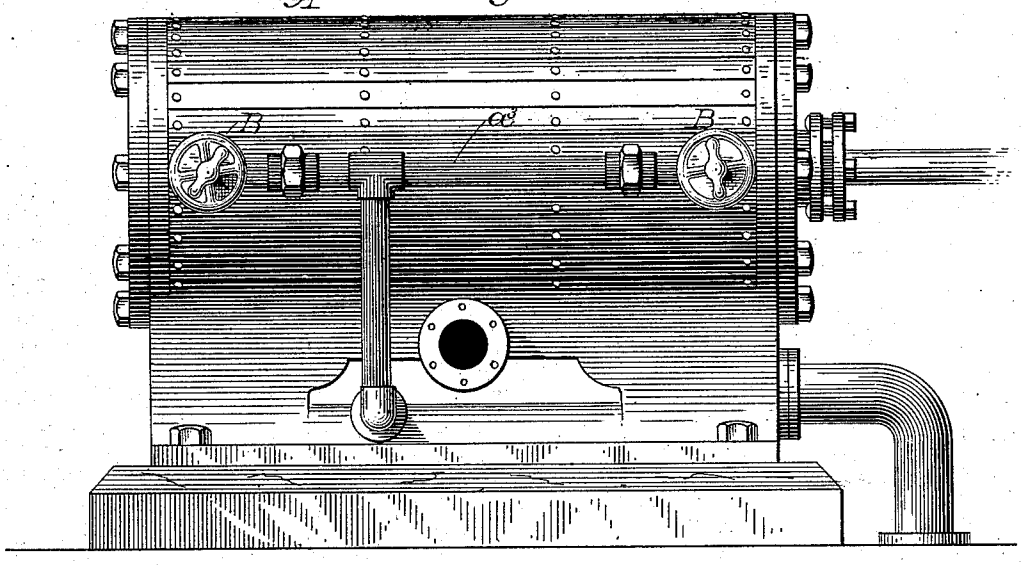
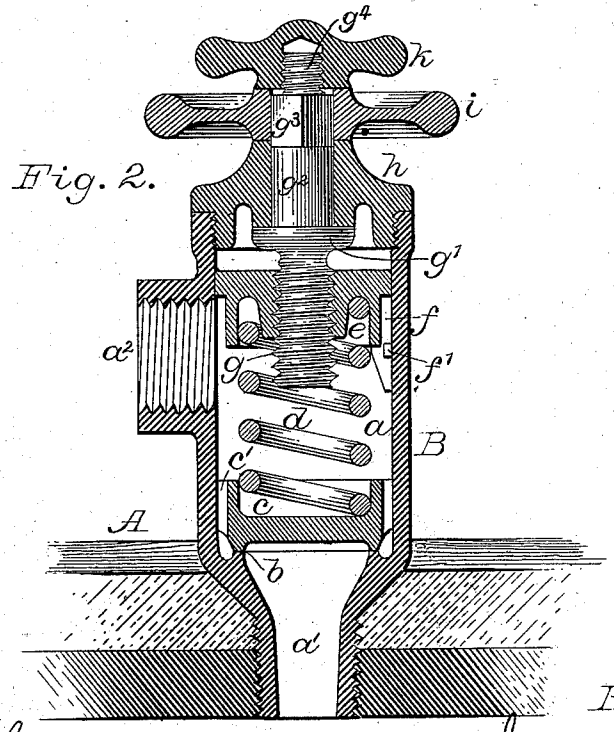


Fig. 2.



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UNITED STATES PATENT OFFICE.

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RELIEF-VALVE FOR ENGINE-CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 269,978, dated January 2, 1883.

Application filed September 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, JEROME WHEELOCK, of the city and county of Worcester, and State of Massachusetts, have invented certain new and useful Improvements in Steam-Engine Cylinders and Relief-Valves therefor; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part thereof, is a clear, true, and complete description of the several features of my invention.

The prime object of my invention is to reduce to a minimum the liability of injury to steam-engines incident to blowing off the cylinder-heads.

Various relief-valves have heretofore been devised for accomplishing the end stated; and my invention relates to certain novel features in construction of a relief-valve and to its arrangement with relation to their discharge-pipes with a view to obtaining efficient and reliable operation, convenience of adjustment, and to the ready and convenient application of indicating apparatus to cylinders having such valves.

After a full description of a steam-engine cylinder and my improvements applied thereto, the features deemed novel will be specified in the several claims hereunto annexed.

Referring to the drawings, Figure 1 is a side elevation of a steam-engine cylinder with my improvements applied thereto. Fig. 2 is a vertical central section of a portion of the cylinder, Fig. 1, and one of the relief-valves.

The cylinder A may be of any of the well-known varieties, regardless of the character of the valve-gear connected therewith or whether it be a horizontal or upright cylinder.

The relief-valve B has a valve-chamber, a, provided with an externally-threaded induction-neck, a', so that it may be firmly set into a threaded hole in the cylinder fitted to receive it. Said chamber has also an internally-threaded eduction-neck, a^2, for connection with a waste-pipe, which communicates with the adjacent exhaust-passage or with the condenser, and thence feed-water heater, in order that the heat from any steam discharged from the cylinder without the actual performance of work may be utilized as far as may be possible. As heretofore constructed, cylinder relief-valves have been provided with eduction-necks; but it will be seen that I have combined with the two valves B a waste-pipe, a^3, in several sections, but common to both valves, and provided with right-and-left screw-connections, with special reference to the ready separation of said sections of the waste-pipe for enabling the ready and convenient application of an indicator attachment to the cylinder. Within the valve-chamber, below the eduction-neck, is an annular valve-seat, b, and a valve or cover, c, is fitted thereto and provided with vertical webs c', which serve to truly guide the valve vertically within said chamber. The valve on its upper side is recessed to afford an annular bearing seat for the expansive spiral spring d, which at its upper end has a similar bearing-seat within a cylindrical nut-follower, e, which is well fitted to the interior of the chamber, and has a slot or groove in its periphery parallel with its axis, which is occupied by the fixed spline or web f, projecting inwardly from the wall of the chamber. At its lower end the web f has a lateral projecting surface, as at f', which serves as a stop for limiting the inward or compressing movement of the follower, thereby securing the spring against undue tension incident to careless adjustment. The nut-follower e is tapped to a threaded valve-stem, g, having a collar, g', a round bearing at g^2, a square neck, g^3, and a threaded top, g^4. The head h of the valve-chamber is tapped into said chamber, and is bored to accurately receive the valve-stem at its round portion g^2 only, and it has at each end thereof, at the top and bottom of said stem-bearing surface, an annular bearing-surface, respectively, for the under side of the hub of the hand-wheel i and the upper surface of the collar g'. The expansive force of the spring causes the collar g' to so bear against the coincident bearing-surface on the head h as to constantly maintain a steam-tight joint, rendering special packing unnecessary. The hand-wheel i is fitted to the square neck g^3 of the stem, and the hand-wheel k is tapped upon the threaded top g^4 of the stem. This hand-wheel nut k performs a varied function, in that its prime office is to so compress the stem-wheel i between it and the top of the chamber-head as to lock said stem-wheel and stem against liability of accidental or tampering ro-

tation, and also in that it co-operates with the collar *g'* in securing a steam-tight joint between it and the head *h*. The thread on the stem is shown to be single; but I sometimes employ a double thread, and even a triple thread may at times be advantageously used. The spring, the follower, and the valve-cover are connected together, so that the cover may be lifted by the valve-stem when desired.

This valve, as shown and described, has been specially devised by me with reference to its use in the particular connection described. When used purely as a relief-valve for securing safety to the cylinder-heads the spring is so set as to permit the valve to open, if at any time and from any cause the pressure within the cylinder should be greater than the maximum pressure required in the performance of duty. When used as a means for connection with an indicator attachment the right-and-left screw-couplings are first so rotated as to effect a disconnection of the sections of the waste-pipe, the indicator inserted in position, the pipe-joints screwed up, and one or both valves opened wide.

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

1. The combination of a steam-engine cylinder and an automatic relief-valve provided with a stem having a packing-collar and a locking-nut, substantially as described.

2. In the relief-valve, the combination, with the threaded stem, the nut-follower, and the spring, of the stop for limiting the compressing movement of the follower, substantially as described, whereby the spring is guarded against undue tension, as set forth.

3. The combination of the steam-cylinder, the relief-valves, and the sectional waste-pipe common to both valves and communicating with the exhaust-passage, substantially as described.

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Witnesses:
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