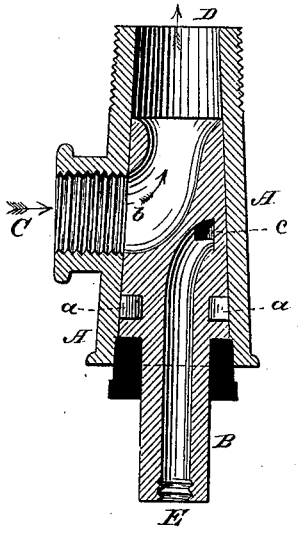
J. L. HEALD.

Stop-Cock for Steam-Boilers.

No. 200,453. Patented Feb. 19, 1878.

Fig. 1.



Fig's. 2.

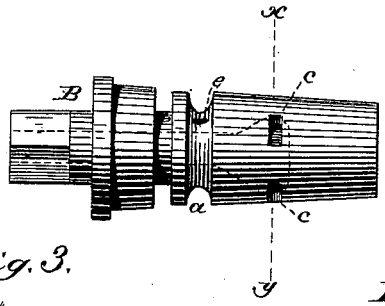
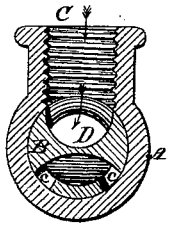


Fig. 3.



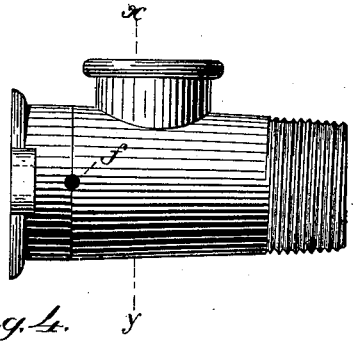
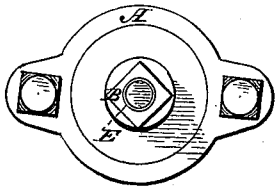


Fig. 4.



Attest:

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UNITED STATES PATENT OFFICE.

JOHN L. HEALD, OF VALLEJO, CALIFORNIA.

IMPROVEMENT IN STOP-COCKS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **200,453**, dated February 19, 1878; application filed December 1, 1877.

To all whom it may concern:

Be it known that I, JOHN L. HEALD, of Vallejo, in the county of Solano and State of California, have invented a new and useful Improvement in Safety Stop-Cocks for Steam-Boilers, which invention is fully set forth and described in the following specification and accompanying drawing.

In the drawing herein referred to, Figure 1 is a longitudinal section, taken vertically through the center of the cock. Fig. 2 is a side view of the parts separated from each other. Fig. 3 is a section through the barrel and plug in the line *x y*, Fig. 2. Fig. 4 is a front-end view of the cock.

The object of my invention is to provide a safety stop-cock for the feed-pumps of steam-boilers, which, when placed between the check-valve and the boiler, will act to prevent any accident or injury to the feed-pump and its connections, if at any time the engineer should neglect to open the cock before the pump is started. It is also designed to provide a way or means for keeping the feed-water inlet in the boiler clear of scale, and thus prevent an undue pressure upon the feed-pipe or connections by a contraction of the opening.

To this end my invention consists in the construction of a stop-cock with an auxiliary eduction port and passage through it, which is brought into action when the main port or inlet-passage of the cock is shut, whereby an outlet for the water from the feed-pipe is provided to the outside at all times when the inlet to the boiler is shut, as will be more fully set forth hereinafter.

In the said drawing, A represents the body of the cock, and B the plug. C is the induction end of the barrel, where the feed-pipe is connected, and D is the end which is inserted into the boiler, it being provided with a screw-thread for the purpose.

The feed-pipe is secured to the cock at right angles to the main passage of the barrel A within the end C, so that the feed-water enters the cock in the direction of the arrow, Fig. 1, and passes into the boiler through the end D. The plug B controls these passages, and has an aperture, *b*, that, when turned in line with the induction C, admits the water through the cock. It has also a longitudinal way or passage, E, running through it and communicating with the interior of the cock through the apertures *c c*, that are situated in line with the passage C. The apertures *c c* are made in the plug opposite to the opening *b*, and they are so placed that when the plug is turned in either direction to shut off the water, one of the apertures shall always be presented in line with the inlet C; thus an outlet always exists through the end of the plug when the cock is closed.

As thus constructed, my invention acts as a safety-cock to relieve the feed-pipe and the pump from a too great pressure, and to prevent accidents in case the water is shut off while the pump is working. This stop-cock is likewise constructed with a means for allowing the water to escape at the side of the cock instead of out through the end of the plug, for when the cock is placed in a horizontal position such construction would be objectionable, as the plug could not be safely operated by any one when the feed-water was running from the end E. This is accomplished by forming a groove or channel, *a*, in the circumference of the plug at any point between the apertures *c c* and the end E of the plug, and connecting it with the longitudinal passage E by means of an opening, *e*, in the channel. A similar opening, *f*, in the side of the barrel A, and in line with the channel *a*, constitutes the means by which the water, passing out through the passage E, the opening *e*, and the channel *a*, is allowed to escape through the side of the cock. In such construction the end of the outlet E in the plug is closed up.

Instead of forming the channel *a* in the plug, it may be made in the interior of the shell or barrel of the cock; but the operation will, in both cases, be the same, and I prefer the construction shown in Figs. 1 and 2 of the drawing, as it is more easily constructed.

In my improved stop-cock it is impossible to place or turn the plug in such position that the water will not go either into the boiler or out through the opening E or *f*, and it is always evident to the engineer whether or not the cock is open when the pump is started. It likewise serves as a means for determining at any time whether it is the pump or the check-valve that is out of order, for by shut-

ting off the cock the water will escape through the openings E or *f* if the check-valve is not working, or if the pump-valves are out of order there will be no issue of water from the end of the cock.

By having this cock so that it can be inserted in the boiler, and its plug B readily removed at pleasure, I am enabled to keep the inlet wherein the feed-pipe is usually secured always free of the scale that accumulates at this point, and, by contracting the opening, soon produces an undue pressure in the feed-pipe, and causes the pumps to work improperly; and this is overcome by removing the cock-plug B and cleaning out the barrel A when the steam is out of the boiler, the inlet and outlet passages C D being made at right angles to each other for this purpose, to allow a clear opening through the barrel or shell A when the plug B is taken out.

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

1. A safety stop-cock having a relief-passage, E, and apertures *c c* formed in its plug, substantially as herein described, for the purposes set forth.

2. A safety stop-cock, A, having the inlet and outlet passages C D situated at right angles to each other, and the passage D extending through the barrel thereof, in combination with the plug B, having the aperture *b* and the passage E and the relief-openings *c c*, the said passage leading out through the end of the plug, or through the channel *a* and outlets *e f*, all constructed and arranged together, substantially as herein described, for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 5th day of November, 1877.

JOHN L. HEALD. [L. S.]

Witnesses:
C. W. M. SMITH,
WILLIAM NARNEY.