(No Model.)

W. T. JOHNSTON.

SAFETY ATTACHMENT FOR STEAM OR OTHER PIPES.

No. 370,339. Patented Sept. 20, 1887.

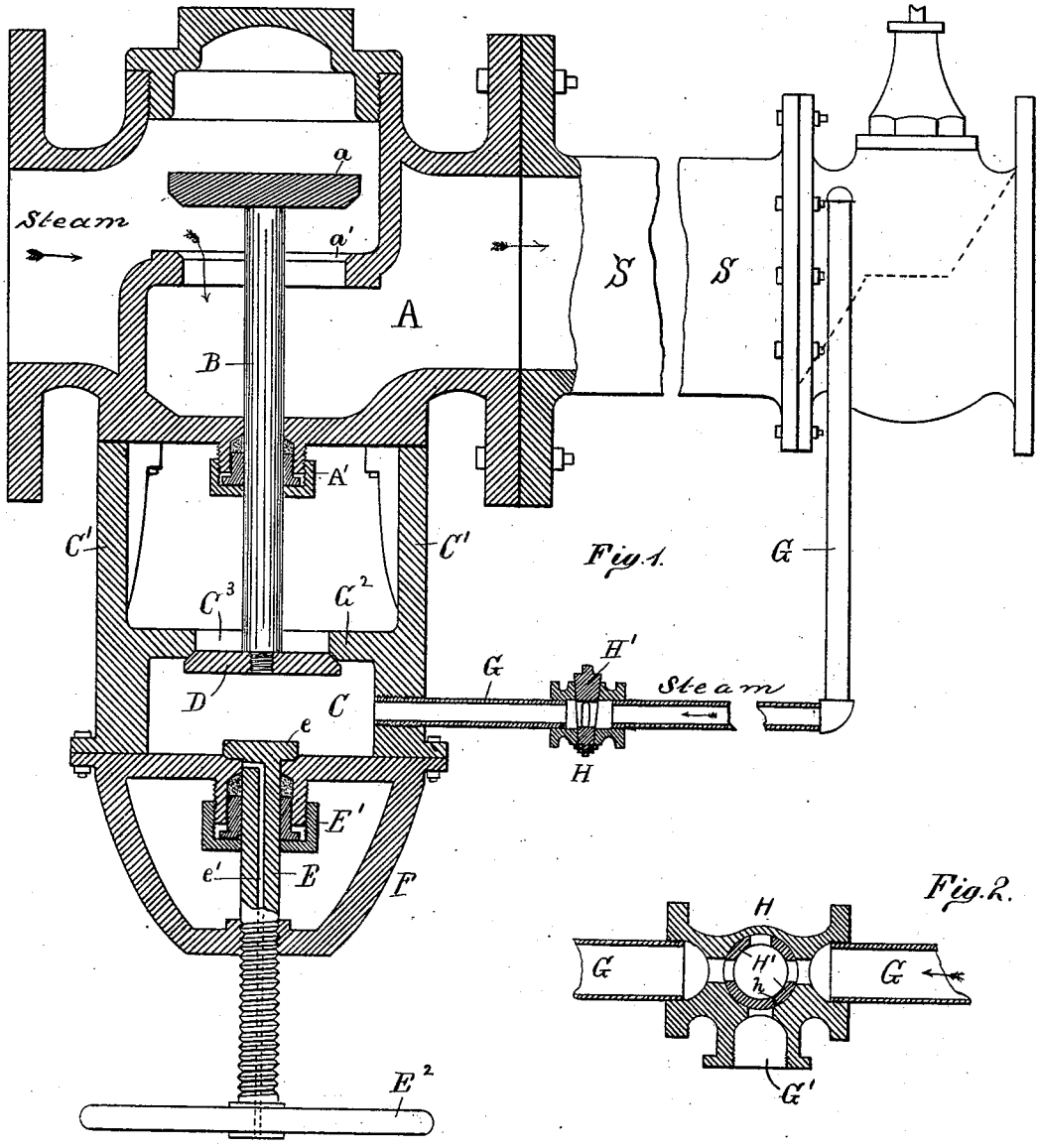


Fig. 1.

Fig. 2.

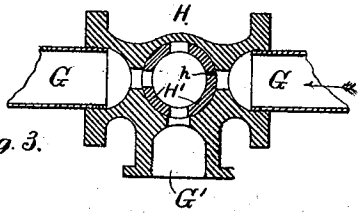


Fig. 3.

Attest
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UNITED STATES PATENT OFFICE.

WILLIAM T. JOHNSTON, OF NEWPORT, KENTUCKY.

SAFETY ATTACHMENT FOR STEAM OR OTHER PIPES.

SPECIFICATION forming part of Letters Patent No. 370,339, dated September 20, 1887.

Application filed April 4, 1887. Serial No. 233,544. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. JOHNSTON, a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Safety Attachments for Steam or other Pipes, of which the following is a specification.

The object of my invention is to provide means for automatically shutting off the steam from the boiler on the occasion of the bursting of the steam-pipe leading from the boiler.

The several features of my invention and the advantages arising from their use, conjointly or otherwise, will be apparent from the following description.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical central section of my device, showing its connections with the steam-pipe. Fig. 2 is a horizontal section of connecting pipe and cock, showing the cock in proper position when the valve is open. Fig. 3 represents the same section, showing the position when the valve is closed.

The upper chamber, A, is provided with valve *a* and seat *a'*, as in ordinary globe-valves. The valve *a* is provided with a stem, B, which projects from its seating-face downwardly, passing through the stuffing-box A'. The chamber C is attached to the chamber A by means of the arms C'. The top C^2 of the chamber C is provided with an opening, C^3, which may be closed by the valve D. The valve D is itself secured to the lower end of the stem B. The stem E is screwed through the brace-arch F, and passes into the chamber C through the stuffing-box E'. The brace-arch F may be dispensed with, and the stem E supported by the means used in ordinary globe-valves, or any other means may be used. The stem E is preferably provided with the head *e*. The opening *e'* passes through the stem E and emerges at the side of the stem just below the head *e*. A wheel, E^2, or other handle, is provided for the stem E. The pipe G connects the interior of the chamber C with the throttle-valve, or with the steam-pipe near the throttle. The three-way cock H is placed in the pipe G at any convenient point. It is arranged to communicate with the two branches of the pipe G and with the short pipe G'. Besides the usual three openings, the plug H' of the cock is provided with a very small opening, *h*, so situated that it will permit a leakage of steam through the short pipe G' when the plug is in any position, except to allow steam to pass through pipe G.

My device is placed in the steam-pipe, preferably as near to the boiler as possible, in such event the flanges I being connected to the steam-drum when the latter is employed. While the most desirable position of my device in relation to the steam-pipe is, as shown, with the chamber C' located below the steam-pipe, nevertheless my device may occupy other positions. For instance, it may be horizontal, the chamber C' being to one side of the steam-pipe, or chamber C' may be above the steam-pipe, my device being properly arranged for that purpose.

The mode of operation is as follows: With the valve *a* seated, steam is shut off from the steam-pipe S. When it is desired to admit steam to the steam-pipe S, the pipe G is first closed by the cock H. Then the stem E is screwed up and impinges against the valve D, and lifts the said valve, and with it the stem B and valve *a*. The valve *a* is raised until the valve D is seated. The cock H is now opened, admitting steam to the chamber C. The stem E is then lowered. The steam which has entered the chamber C through the pipe G serves to keep the valve *a* open. Now, should the steam-pipe burst, the steam in the chamber C would instantly escape and the pressure within the chamber be reduced to that of the atmosphere. The unbalanced pressure on the valve *a* would then come into play and instantly seat the valve, in this way preventing further escape of steam from the boiler.

It is evident that with the stem E raised the device would fail to operate, and to insure the stem E being lowered is the object of the opening *e'*, which permits steam to escape from the chamber C as long as the stem E is raised, and thus calls the attention of the engineer to the omission.

When it is desired to close the valve *a*, the three-way cock is turned so as to allow the steam in the chamber C to escape through the pipe G' into the atmosphere. The unbalanced pressure on the valve *a* instantly seats it.

As an extra precaution to insure the attention of the engineer being called to the cock H, in case it should be improperly set, the small opening *h* in the plug H′ is provided. This opening permits a leakage of steam through pipe G′, except when the cock is in proper position for admitting steam to the chamber C. Stops are so arranged that the plug H′ can occupy only the position shown in Figs. 2 and 3.

Besides steam-pipes, my safety device may be applied to pipes conveying oil, water, or other liquid under pressure.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a pipe provided with a cut-off valve, the said valve provided with a stem projecting through the wall of the pipe, the said stem passing into a detached chamber and provided therein with a second valve, and the said chamber communicating with the pipe by appropriate means, substantially as set forth.

2. The combination of a pipe provided with a cut-off valve, the said valve provided with a stem projecting through the wall of the pipe, the said stem passing into a detached chamber and provided therein with a second valve, and the said chamber communicating with the pipe by appropriate means, and means for opening the said cut-off valve, substantially as set forth.

3. The combination of valve-chamber A, valve *a*, stem B, chamber C, valve D, and pipe G, and means for opening valve *a*, substantially as set forth.

4. The combination of valve-chamber A, valve *a*, stem B, chamber C, valve D, and pipe G, provided with suitable cut-off valve, and means for opening valve *a*, substantially as set forth.

5. The combination of valve-chamber A, valve *a*, stem B, chamber C, valve D, pipe G, three-way cock H, and means for opening valve *a*, as and for the purposes specified.

6. The combination of valve-chamber A, valve *a*, stem B, chamber C, valve D, pipe G, three-way cock H, having leak-opening *h*, and means for opening valve *a*, substantially as specified.

7. The combination of the valve-chamber A, valve *a*, stem B, valve D, chamber C, pipe G, stem E, and suitable screw-bearing for same, substantially as set forth.

8. The combination of the valve-chamber A, valve *a*, stem B, valve D, chamber C, pipe G, stem E, and suitable screw-bearing for same, with the passage *e′*, substantially as set forth.

9. The combination of valve-chamber A, valve *a*, stem B, valve D, chamber C, pipe G, provided with three-way cock H, stem E, and suitable screw-bearing for the same, substantially as set forth.

10. The combination of valve-chamber A, valve *a*, stem B, valve D, chamber C, pipe G, stem E, and brace-arch F, substantially as set forth.

WILLIAM T. JOHNSTON.

Attest:
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