J. Frick,

Steam-Boiler Cleaner.

No. 14,449. Patented Mar. 18, 1856.

Fig. 2.

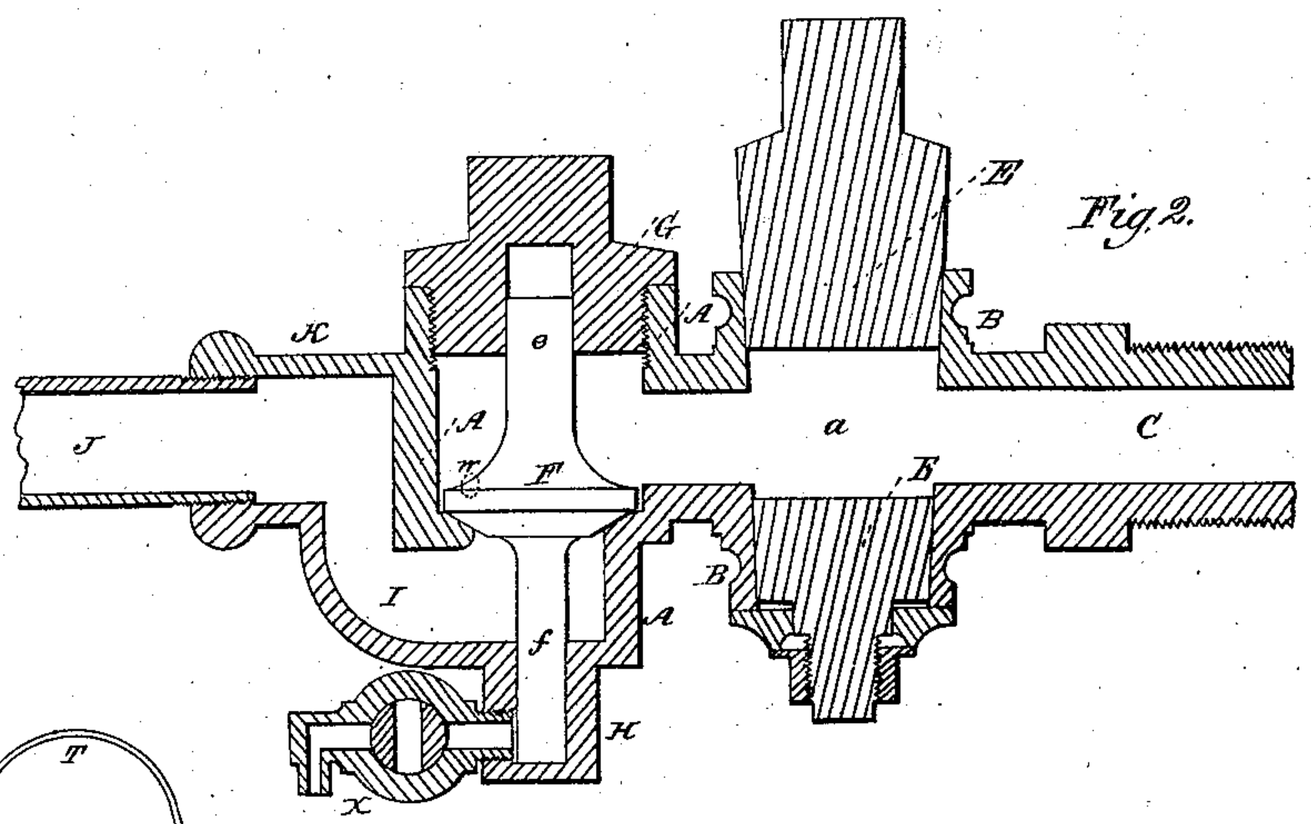


Fig. 1

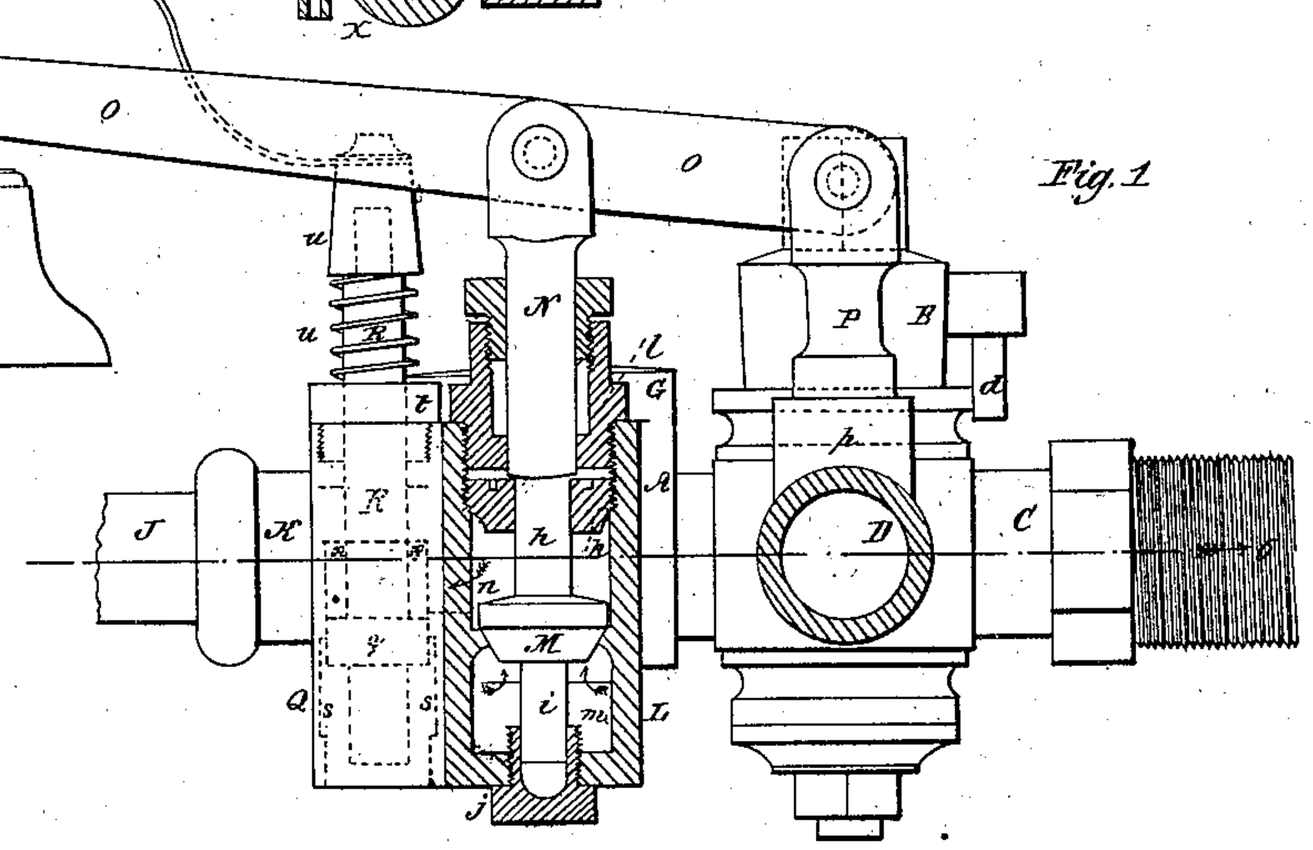
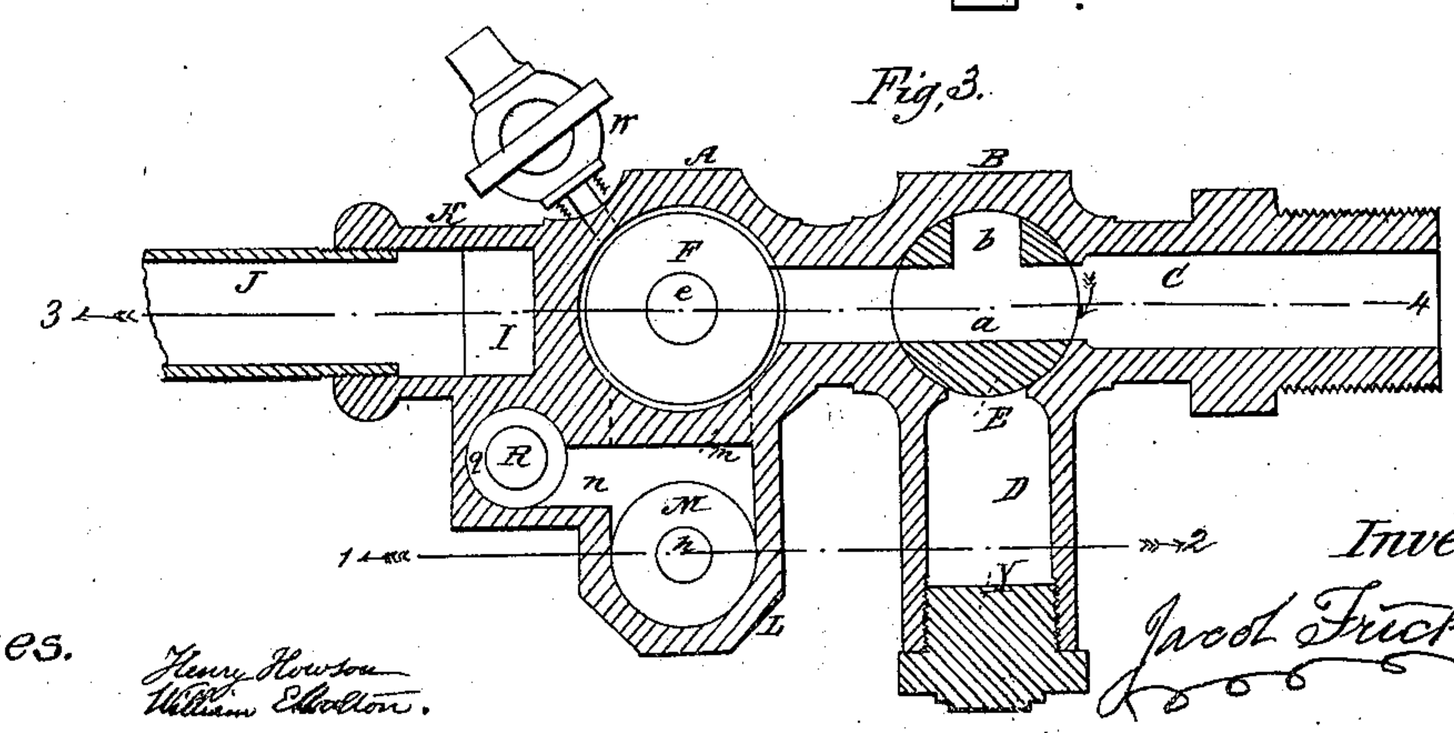


Fig. 3.



Witnesses.

Henry Howson
William Elliston.

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UNITED STATES PATENT OFFICE.

JACOB FRICK, OF PHILADELPHIA, PENNSYLVANIA.

FEED AND BLOW-OFF APPARATUS FOR STEAM-BOILERS.

Specification of Letters Patent No. 14,449, dated March 18, 1856.

To all whom it may concern:

Be it known that I, JACOB FRICK, of the city of Philadelphia and State of Pennsylvania, have invented certain Improvements in Feed and Blow-Off Apparatus for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention consists in arranging together, in one instrument, a check valve, stop valve, and blow off valve for steam boilers, in such a manner that the whole may be secured to the boiler by one attachment only, thereby avoiding the necessity of piercing and wounding the boiler in several places for the purpose of making the separate and distinct attachments hitherto employed for the same purpose.

It further consists in employing, in connection with the above valves and cocks, a pressure valve and alarm apparatus fully described hereafter for the purpose of notifying the attendant engineer when any undue obstruction is offered to the regular flow of water, from the feed pump to the boiler.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

On reference to the drawing which forms a part of this specification Figure 1 is an elevation (partly in section on the line 1, 2 Fig. 3) of my combined feed, alarm, and blow off apparatus for steam boilers. Fig 2, a sectional elevation of the same on the line 3—4 Fig. 3, and Fig. 3, a sectional plan on the line 5—6 (Fig. 1).

The same letters of reference allude to similar parts throughout the several views.

A is the chest containing the check valve and B the casing of the combined stop and blow off cock. Cast to and projecting (at right angles to each other) from the casing B are the hollow projections C and D, the former screwing into and communicating with the steam boiler, and the latter forming the blow off passage.

E is the plug of the stop and blow off cock having one opening *a* directly through it, and another opening *b* communicating with *a* at right angles. These openings are so arranged that when the plug is turned to the position shown in Fig. 3, there is a direct communication from the check valve through the opening *a*, and through the interior of C, to the boiler but when turned in the direction of the arrow, so that the opening *b* coincides with the interior of the projection C, the passage from the check valve is stopped, and a communication opened between the boiler and the blow off passage D. The top of the plug E is furnished with a projection *d* which strikes against projections on the top of the casing B and prevents the said plug from being turned to any other positions than the two above described.

F is the check valve operating and having its seat in the chest A, the upper stem *e* of the valve moving in an orifice in the cover G of the chest, and the lower stem *f* moving in the opening of the projection H. Below the valve the interior of the chest communicates by the curved passage I with the feed pipe J which screws into the hollow projection K.

To the chest A of the check valve is cast the chest L of the safety valve M, below the seat of which the two chests communicate with each other by the passage *m*. The lower stem *i* of the safety valve M moves in the nut *j* which screws into the bottom of the chest L and the upper stem *h* in the nut *k* below the stuffing box *l*. Through the latter passes the rod N the end of which bears on the top of the stem *h* of the safety valve, its upper end being jointed to the lever O which has its fulcrum on the stud P the latter being screwed into a projection *p* on the blow off passage D.

Cast or otherwise secured to the chests A and L, is another chest Q, the lower part of which is bored out for the reception of the piston *q* on the rod R. Above the piston *q* the interior of the chest Q communicates by the passage *n* with the space between the valve M and nut *k* in the chest L. The interior of the chest Q in which the piston *q* operates has several grooves *s*, the top of which are covered by the piston, when the latter is at rest, but when moved downward by the action hereafter described a passage is formed from the space in the chest L above the valve M through the passage *n*, and down the grooves S through the bottom of the chest Q. The latter is furnished at the top with a stuffing box *t*, through which passes the piston rod R. This is furnished at the top with a nut *u* between which and the top of the stuffing box gland *t* intervenes

a spiral spring *w* which has a tendency to keep the piston *q* with its rod in the position shown in Fig. 1, when not otherwise depressed.

In order to prevent the piston rising too high the rod is furnished with projections *x* which fit against the shoulder in the chest Q. To the top of the nut *u* I attach a spring T furnished at the end with a bell, or I otherwise connect the top of the piston rod R by means of wires to any other suitable alarm apparatus within the hearing of the attending engineer.

W is a cock for discharging any water which may collect in the chest A above the check valve F, and X a similar cock for drawing off the water which may collect below the valve in the projection H.

Y is a plug which always remains screwed into the end of the projection D, as long as the latter is not used for blowing off from the boiler.

Operation: The plug E of the stop and blow off cock being in the position shown in Fig. 3, and the lever O weighted to suit the pressure in the boiler, against which the water has to be forced, a communication exists from the feed pumps through the pipe J attached to the same, through the seat of the check valve F (which operates according to the action of the pump in the usual manner,) and the plug E of the stop and blow off cock to the boiler. Should the plug have been turned accidentally or otherwise so as to obstruct the passage of the feed water to the boiler, the pump of the engine being still in operation, the excessive pressure occasioned by this obstruction and the action of the pump combined, will cause the water to act on the underside of the safety valve M, and raising the latter will pass through the opening *n* to the space in the chest Q above the piston *q* passing down the latter until a portion of the water can escape down the grooves S, and at the same time causing the bell to ring; during the time the feed pump takes its upward stroke this excessive pressure will cease and the spiral spring *w* will raise the piston *q* to its former position, but immediately the down stroke commences, the depression of the piston takes place, and the alarm continues until the engineer either regulates the pump or the plug E of the stop and blow off cock. When the latter has to be used for blowing off the boiler, the plug Y is removed, and a bent or other pipe, directed to an adjacent drain or sewer, screwed into its place, the plug E is then turned until its opening *b* coincides with the passage through the projection C to the boiler when a blow off passage is immediately formed. When used as a stop cock only for obstructing the feed water from the boiler, the plug Y is retained in the position shown in Fig. 3.

I do not claim the combining of a check valve, and stop cock, in one instrument the same being in common use, but

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

1. Arranging substantially in the manner set forth, a check valve, and stop and blow off valve, in one instrument, for steam boilers, for the purpose of avoiding the attachment of the separate and distinct connections hitherto employed for the same purpose.

2. The pressure valve M with its weighted lever as connected with the alarm valve and as arranged with the check and stop valve, the whole being constructed and operating, substantially in the manner and for the purpose herein set forth.

JACOB FRICK.

Witnesses:
HENRY HOWSON,
WILLIAM E. WALTON.