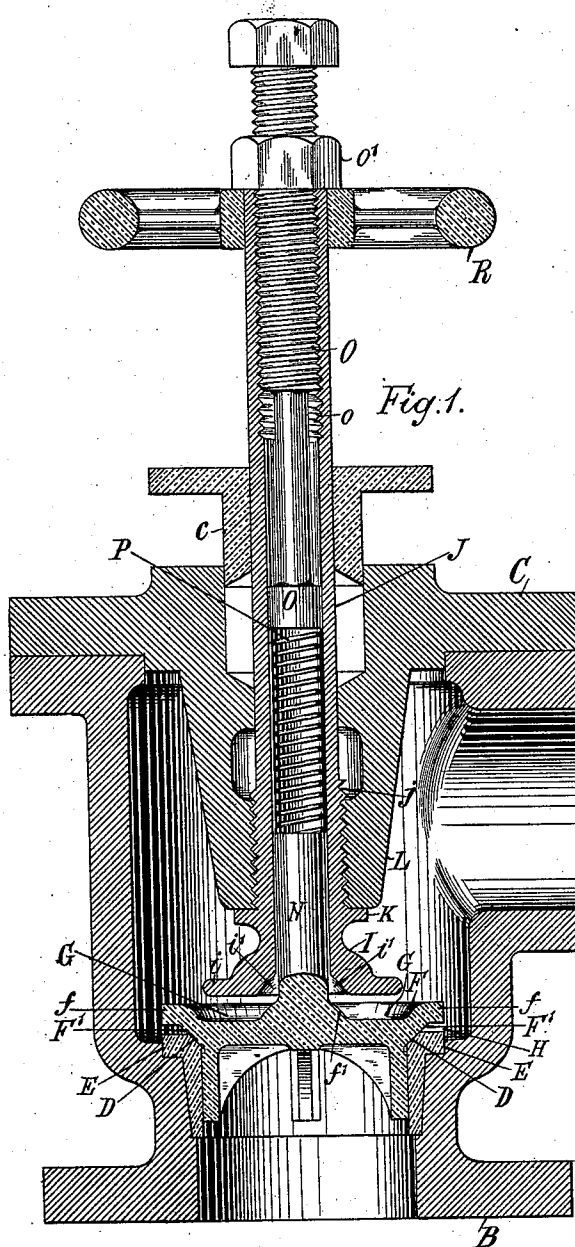


(No Model.)

J. S. WYNDHAM & J. H. HALLETT.
CHECK VALVE.

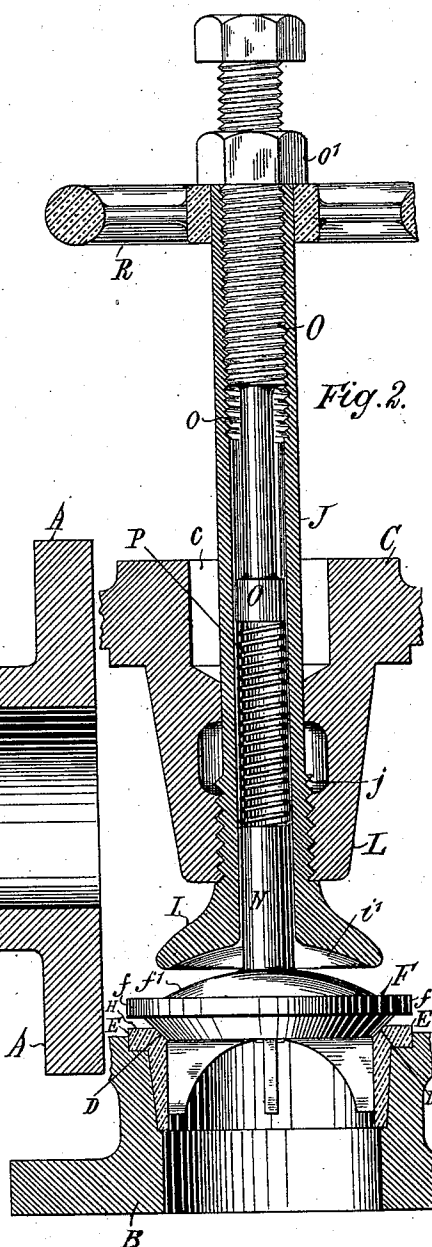
No. 574,295.

Patented Dec. 29, 1896.



Witnesses.

Robt. A. Blake
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Inventors.

James Steven Wyndham,
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UNITED STATES PATENT OFFICE.

JAMES STEVEN WYNDHAM AND JOHN HARRY HALLETT, OF CARDIFF,
ENGLAND.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 574,295, dated December 29, 1896.

Application filed January 24, 1896. Serial No. 576,714. (No model.) Patented in England November 18, 1895, No. 21,922, and November 22, 1895, No. 22,358.

To all whom it may concern:

Be it known that we, JAMES STEVEN WYNDHAM and JOHN HARRY HALLETT, subjects of the Queen of the United Kingdom of Great Britain and Ireland, residing at Cardiff, in the county of Glamorgan, England, have invented certain new and useful Improvements in Check-Valves, (for which we have obtained the following patents: Great Britain and Ireland, No. 21,922, dated November 18, 1895, and No. 22,358, dated November 22, 1895;) and we do hereby declare that the following is a full, clear, and exact description of the invention, reference being made to the accompanying drawings, which are to be taken as part of this specification and read therewith, and one which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in check-valves such as are used on the water-supplies to steam-boilers and to which it is particularly applicable.

It is the common experience of engineers that the valve ordinarily used as a check-valve on water-supplies to steam-boilers gets out of working order very quickly, because at the end of each lift the crown of the valve hammers violently against the stop, and also because the valve beats itself heavily on the miter or seat at the end of each drop of the valve.

The object of the present invention is to prevent the above-mentioned hammering and beating.

The invention includes improved means for providing for the presence of a water-cushion between the valve-face and its seating during the drop of the valve.

It also includes improved means for providing for the presence of a water-cushion between the back of the valve and the valve-stop during the lift of the valve.

It further includes the combination, with the valve, valve-seat, and valve-stop, of improved means for providing for the presence of a water-cushion between the valve-face and its seating during the drop of the valve

and for the presence of a water-cushion between the valve and the valve-stop during the lift of the valve.

Referring to the accompanying drawings, Figure 1 is a vertical section through the center of an ordinary check-valve box fitted with our improved valve-guard and spindle. Fig. 2 is a vertical section of a modification of the present invention.

Referring to Fig. 1, A is the flange by which the valve-box is held to the boiler or to the pipes. B is the flange by which the lower part of the said box is held to the feed-pump pipe. C is the cover of the valve-box, and c the stuffing-box therein. The foregoing parts are of the same construction as heretofore.

D is the valve seat or miter, and E the flange outside the same.

F is the improved valve; F', its miter; f, its lip, extending round the outer edge of it, and G a central annular cavity in the back of the valve formed by the lips f being in a plane higher than that of the valve F. The miters D and F' being the actual valve-seat and the contacting valve-surface, respectively, are, as far as they themselves are concerned, the same as heretofore. The lip f stands in such a position relatively to the flange E that when the latter is on its seat or miter D the under face of the lip is separated from the flange E by a distance H.

I is the bottom end of the screwed spindle J and forms the valve-stop. The spindle is tubular throughout its length. The valve-stop I is in the form of an inverted cup having a large horizontal rim i. The cavity i of the valve-stop I corresponds in respect of its contour with that of the crown f' of the valve F, while the cross-section of the rim i corresponds with that of the cavity G.

j is the screw-thread on the tubular spindle J. It engages in the depending extension L of the cover C. The spindle passes out through the stuffing-box c for a sufficient distance, and is there fitted with a hand-wheel R for adjusting the lift of the valve F or for holding it down upon its seat, according to the distance at which the end I is set over such

valve. The stop I stands at a sufficient distance above the valve F to allow of its maximum lift.

K is a collar on the spindle J, adapted by its position thereon to limit the upward motion of the said spindle by contacting with the opposite end of the extension L. It also serves, when screwed up tight against the latter, to form a water and steam tight closure between the stuffing-box c and the interior of the valve-box, thereby relieving the stuffing-box from steam-pressure.

R is the usual hand-wheel, fast on the outer end of the spindle J for turning it.

N is the valve-spindle, fast to and projecting upward from the crown *f'* of the valve F and entering the bore of the spindle J, whereby the accurate motion of the valve F is secured.

O is a set-screw adapted to work up and down the screw-thread *o* in the top end of the spindle J, and *o'* is a nut for locking it in any desired position therein.

P is a spiral spring within the tube J and between the spindle N and the set-screw O. This spring is sufficiently strong to, using the inner end of the set-screw O as a base, keep the valve F down upon its seat independently of the pressure upon the back of the latter.

Our invention operates in respect of its several features as follows:

Water-cushion during the drop of the valve.—The improved means for providing this consists of the lip *f*, the flange E, and the spring P. At the moment when the valve begins its drop under the action of the said spring there is obviously an annulus of water between the said lip and flange *f* and E. The whole of this annulus, with the exception of as much as is represented by the space H, must be displaced by the spring P before the valve F can reach its seat. It is the yielding resistance of the above-mentioned annulus of water to the action of the spring P that constitutes the water-cushion in question, such yielding being delayed by the opposition to the motion of the water away from the axis of the valve due to the presence of the opposite portion of the valve-box.

Water-cushion during the lift of the valve.—The improved means for providing this con-

sists, according to one modification of the invention, of the lip *f*, the cavity G in the back of the valve, the rim *i* on the valve-stop I immediately above the said cavity, the valve-crown *f'*, and the cavity *i'* in the valve-stop immediately above the said crown. At the moment when the lift of the valve F commences there is obviously an annulus of water between the valve back and crown beneath and the stop-rim *i* and cavity *i'* above. The whole of this annulus must be removed before the lift can be completed, and it is its yielding resistance to the suction acting on the under side of the valve that constitutes the water-cushion in question, such yielding being delayed by the opposition to the motion of the water away from the axis of the valve-spindle N due to the presence of the inner edge of the lip *f* and the cup *i*.

According to the other modification of the invention—the one illustrated in Fig. 2—the central annular cavity G and the rim *i* are dispensed with and both valve-crown *f'* and cup-shaped cavity *i'* enlarged accordingly.

We claim—

The combination of mitered valve-seat, a flange outside the same in the plane of the top of it, a mitered valve, a lip outside the same and projecting therefrom in a plane sufficiently high to stand at a distance above and clear of the top of the above-mentioned valve-seat flange when the valve is down on its seat, a spindle standing up from the center of the back of the valve, a tubular spindle adapted to receive the said spindle, an annular cavity in the back of the valve between the crown and the lip of the flange and an adjustable valve-stop of the same diameter as the said annular cavity and presenting a corresponding sectional contour to the said annular cavity and crown.

In witness whereof we have hereunto affixed our signatures, in presence of two witnesses, this 10th day of January, 1896.

JAMES STEVEN WYNDHAM.
JOHN HARRY HALLETT.

Witnesses:

SAMUEL WESLEY ALLEN,
G. ED. WAUGHFLING.