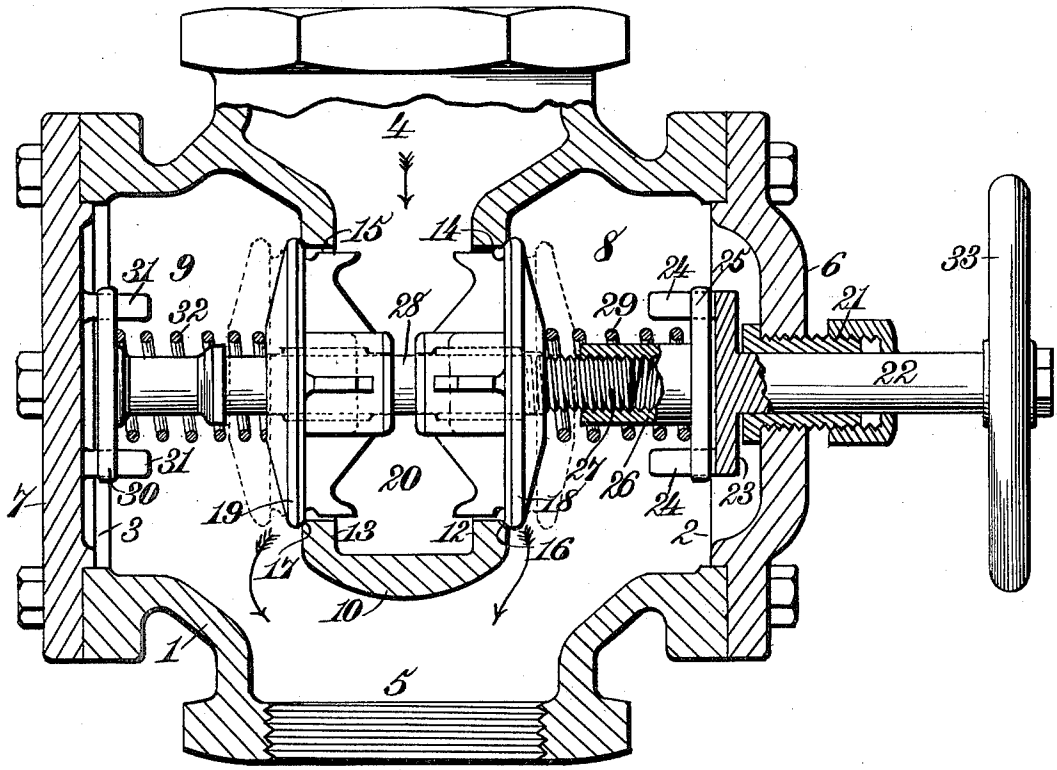
No. 626,593. Patented June 6, 1899.

A. W. CASH.

CHECK VALVE FOR BOILERS.

(Application filed Oct. 15, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ARTHUR WISE CASH, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE FOSTER ENGINEERING COMPANY, OF SAME PLACE.

CHECK-VALVE FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 626,593, dated June 6, 1899.

Application filed October 15, 1898. Serial No. 693,616. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR WISE CASH, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Check-Valves for Boilers, of which the following is a specification.

The chief object of the present invention is to provide a new and improved check-valve which is automatic in action and at the same time is susceptible of being manually operated to tighten the valve-disks against their seats and which is strong, substantial, and durable, effective in operation, and useful for many purposes, although designed with special reference to its employment in connection with that class or type of large stationary boilers wherein a plurality of boilers are arranged as a battery, one valve being placed in operative connection with each boiler in juxtaposition to the main steam-pipe or header, the construction being such that if any one boiler is disabled—as, for instance, by the blowing out or bursting of a tube—the check-valve instantly closes and prevents the pressure from the main steam-pipe or header and the remainder of the boilers from blowing back through the disabled boiler, the valve remaining closed until the required repairs have been made and it is desired to again connect the repaired boiler with the main steam-pipe or header.

The object of my invention is accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawing, in which the figure is a central sectional view of my improved automatic check and hand stop valve.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawing, wherein the numeral 1 indicates the valve casing or shell, having four openings 2, 3, 4, and 5. The openings 4 and 5 are adapted to be connected, respectively, with the inlet and and outlet pipes, while the openings 2 and 3 enable the valve stems and springs, hereinafter described in detail, to be introduced, after which the openings 2 and 3 are closed or covered by the cap or closure plates 6 and 7, held in proper position by screw-bolts or otherwise. The openings 2 and 3 are substantially at right angles to the openings 4 and 5, and the valve casing or shell is divided into two separate compartments 8 and 9 through the medium of a continuous web 10, constructed to provide two separated substantially rectilinear partitions 12 and 13, containing circular openings 14 and 15. The outer or upper edge of the circular opening 14 is constructed to provide a valve-seat 16, and the lower or outer edge of the circular opening 15 is also constructed to provide a valve-seat 17. In connection with the valve-seats I provide two valve-disks 18 and 19, which in operation approach each other to seat, respectively, against the valve-seats 16 and 17 and which move away from each other to open the valve, so that the pressure can flow from the central inner chamber 20 to the outer chambers 8 and 9. The valve-disks may be of any construction suitable for the purpose in hand, so that when they are opened or moved away from the valve-seats the pressure may flow through the openings 14 and 15 in the partitions formed by the continuous web.

The cap or closure plate 6 is provided with a stuffing-box 21, through which the central spindle 22 passes for the purpose of manually forcing the two valve-disks simultaneously against the valve-seats when desired, as will hereinafter appear. The inner end of the spindle 22 is provided with a cross-head 23, having projecting fingers or lugs 24, which engage the ends of a cross-head 25, secured to or forming part of a screw-nut composed of an internally-screw-threaded sleeve 26, engaging the outer screw-threaded end 27 of a valve-stem 28, the axis of which is coincident with the axis of the spindle 22. A spiral or other suitable spring 29, preferably a light phosphor-bronze spring, is interposed between the valve-disk 18 and the cross-head 25 on one end of the internally-screw-threaded sleeve 26. The spring is normally held under slight compression. The stem 28 passes centrally through the two valve-disks, and at its lower end it is constructed or provided with a cross or T-shaped head 30, held against rotary motion by fingers or lugs 31, projecting from the inner side of the cap or closure plate 7. A spring 32, like or similar to the spring

29, is interposed between the lower or outer side of the valve-disk 19 and the cross-head 30. This spring is also normally held under slight compression. The cross-head 30 is susceptible of moving longitudinally between the fingers or lugs 31, so that the stem 28 can slide longitudinally and follow the valve-disk 19 when the two valves are forced toward each other against the valve-seats 16 and 17 to shut off the flow of fluid in either direction. The spindle 22 is provided with a hand-wheel 33 or other suitable means by which to turn it for the purpose of rotating or turning the internally-screw-threaded sleeve 26, which, as before stated, is in screw-threaded connection with the outer end 27 of the stem 28. Through the medium of the cross-head 23, fingers or lugs 24, and cross-head 25 the turning motion of the spindle 22 is imparted to the internally-screw-threaded sleeve 26, whereby the stem 28 is moved longitudinally in one direction and the sleeve 26 is moved longitudinally in the opposite direction for the purpose of simultaneously closing the two valve-disks upon their valve-seats to close the valve. The springs 29 and 32 are of such length that they exert but little force or pressure on the valve-disks when the latter are seated against or are close to their valve-seats, and consequently while there is any volume of pressure passing from the boiler to the main steam-pipe or header the valve-disks will be forced open sufficiently for the passage of the steam; but when the flow of steam from the boiler to the main steam-pipe or header ceases the pressure at the sides of the valve-disks is equalized and the slight force or power exerted by the springs will close the valve-disks, and thereby prevent the backflow of steam.

It will be seen from the foregoing that when the spindle 22 is turned in the proper direction to move the stem 28 longitudinally in one direction and the sleeve 26 longitudinally in an opposite direction the two independent springs 29 and 32 are more or less compressed and operate to force the two valve-disks tightly against their seats, and therefore I make the two valve-disks independent of each other and mount them upon the stem 28, so that they can be moved longitudinally thereupon by the springs. If the two valve-disks do not tightly fit the valve-seats when they are closed automatically, and hence fail to entirely or perfectly shut off the escape of steam, the hand-wheel 33 may be manipulated for the purpose of forcing the two valve-disks toward each other, so that they may be tightly seated against the valve-seats to effectually shut off escaping steam until such time as repairs shall have been made and it is desired to connect the repaired boiler with the main.

As before stated, a valve constructed according to my invention is designed to be placed on the outlet of each boiler of a battery of boilers in juxtaposition to the point where the boiler connects with the main steam-pipe or header, so that if one boiler becomes disabled from any cause whatever the valve automatically closes and prevents the steam-pressure from the main steam-pipe or header and from the remainder of the boilers from blowing back through the disabled boiler.

In the application of the valve it should always be placed in such manner that whether on a vertical or on a horizontal pipe the spindle and the stem will lie substantially in a horizontal plane, so that the slight friction of the valve-disks, resting on their wings and on the stem 28, will prevent chattering.

Having thus described my invention, what I claim is—

1. A combined automatic check and hand stop valve, consisting of a casing or shell having a central inlet-chamber and a partially-surrounding outlet-chamber separated therefrom by a web having opposite openings, two valve-disks movable toward each other to simultaneously seat upon the valve-seats and close said openings, springs bearing, respectively, against the valve-disks and normally forcing them toward each other against the valve-seats but permitting the flow of fluid-pressure from the central inlet-chamber to the partially-surrounding outlet-chamber, while preventing backflow of fluid-pressure, and manually-operated devices for forcing the two valve-disks toward each other tightly against the valve-seats, substantially as described.

2. An automatic check and hand stop valve, consisting of a valve casing or shell having a central inlet-chamber and a partially-surrounding outlet-chamber separated therefrom by a web having opposite openings, check-valves arranged in said openings, and independent springs operating, respectively, upon the two valves to normally press them toward one another against their seats to close the openings in the said web, whereby fluid-pressure is permitted to flow in one direction from the inlet to the outlet chamber, through the two openings in said web, but is prevented from flowing in the reverse direction, substantially as described.

3. An automatic check and hand stop valve, consisting of a casing or shell having a central inlet-chamber and a partially-surrounding outlet-chamber separated therefrom by a web containing two opposite openings, valve-disks fitted to said opening and moving toward each other to close the same, springs which normally move the valve-disks against their seats, a threaded stem passing through the valve-disks, a screw-nut engaging the threaded part of the stem, and a spindle for turning the nut, whereby both valve-disks are simultaneously moved toward each other tightly against the valve-seats, substantially as described.

4. An automatic check and hand stop valve, consisting of a casing or shell having a central inlet-chamber and a partially-surround-

ing outlet-chamber separated therefrom by a web containing opposite openings, two valve-disks fitted to said openings, springs which normally hold the valve-disks against their seats, a threaded stem passing centrally through the valve-disks, a screw-nut engaging the threaded part of the stem, a spindle extending to the exterior of the casing of the shell, and means for connecting the said spindle with the screw-nut for turning the latter and permitting it to move longitudinally independent of the stem, substantially as described.

5. An automatic check and hand stop valve, consisting of a casing or shell having an inlet-chamber and an outlet-chamber separated by a web containing opposite openings, a stem having at one end a cross-head, means for holding the cross-head against rotation while permitting the stem to move longitudinally, two valve-disks loosely mounted on the stem and movable toward each other against their valve-seats, a spring interposed between one of the valve-disks and the cross-head of the stem, a screw-nut engaged with a threaded end of the stem and having a cross-head, a spring interposed between the cross-head of the nut and the other valve-disk, and a spindle engaged with the cross-head of the nut, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARTHUR WISE CASH.

Witnesses:
JOHN A. MILLER,
F. J. GREENBERG.