(No Model.)

J. STROMVALL.

CHECK VALVE.

No. 599,650. Patented Feb. 22, 1898.

Fig. 1.

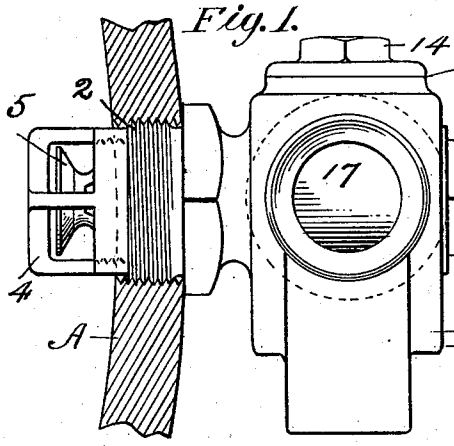


Fig. 2.

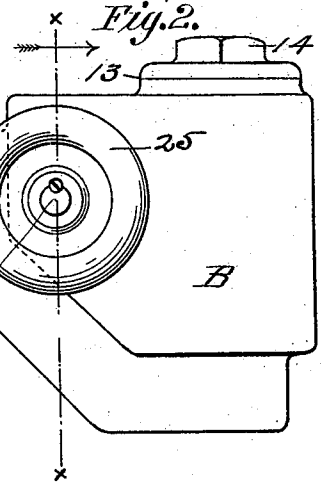


Fig. 3.

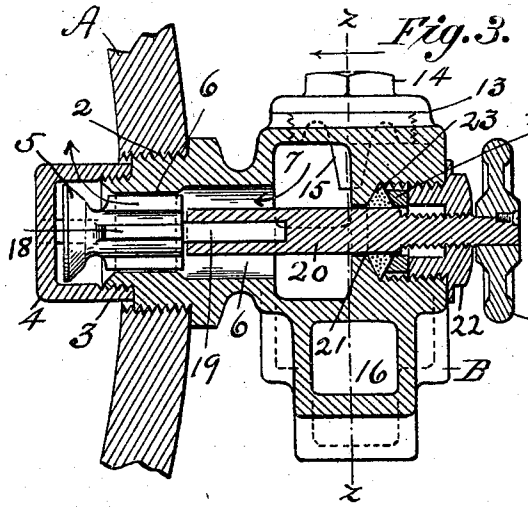


Fig. 4.

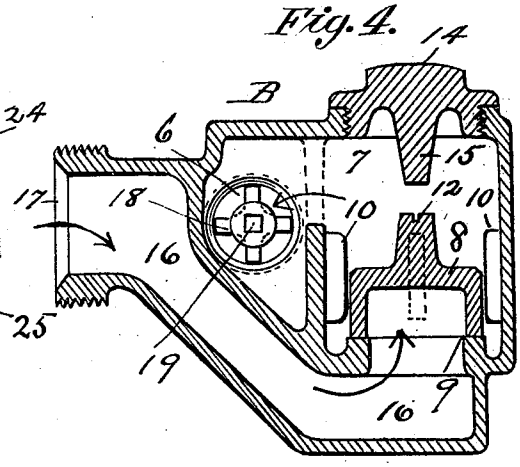
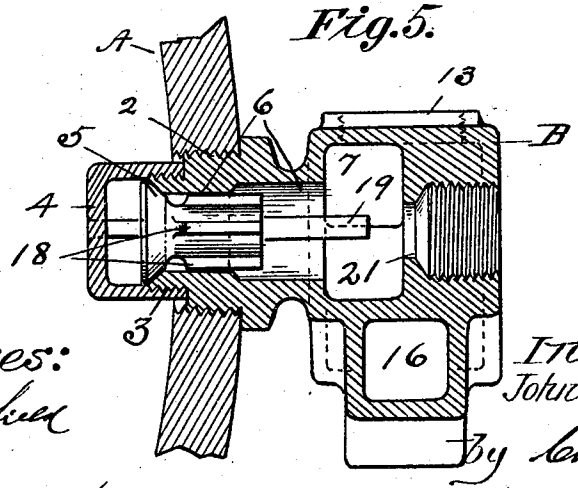


Fig. 5.



Witnesses:
J. H. Garfield
K. I. Clemons

Inventor:
John Stromvall.
By Chapin & Co
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN STROMVALL, OF SPRINGFIELD, MASSACHUSETTS.

CHECK-VALVE.

SPECIFICATION forming part of Letters Patent No. 599,650, dated February 22, 1898.

Application filed October 23, 1897. Serial No. 656,139. (No model.)

To all whom it may concern:

Be it known that I, JOHN STROMVALL, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Check-Valves, of which the following is a specification.

This invention relates to steam-boiler connections, and particularly to the check-valve construction interposed between an injector or feed-pump supplying water to a steam-boiler, the object of the invention being to produce a check-valve construction the check-valve proper of which may be reground to its seat in the body of the valve while the full pressure of steam is on the boiler, thereby avoiding any interference with the use thereof while said check-valve is being reground, as described, and also providing against the escape of steam from said boiler should the check-valve body be accidentally broken off from the neck thereof, by which connection is made with the boiler; and the invention consists in the arrangement and construction of the parts, all as set forth in the following specification and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 represents a check-valve body in end elevation constructed according to my invention and screwed into the shell of a boiler, a portion of which is shown in section. Fig. 2 is a side elevation of the valve-body shown in Fig. 1, showing attached to the inlet end thereof by a union-joint the end of a feed-pipe leading to an injector or feed-pump. Fig. 3 is a section of Fig. 1 on line $x\,x$, Fig. 2. Fig. 4 is a section of Fig. 3 on line $z\,z$ of that figure. Fig. 5 is a sectional view similar to Fig. 3 with some of the parts removed.

Referring to the drawings, A represents a portion of the shell of a boiler, in which the valve-body B is secured by a screw-threaded neck 2 on said valve-body entering a suitably-threaded hole in said shell in the ordinary manner. The said screw-threaded neck is of two diameters, the one described for screwing into the boiler-shell and a smaller one 3 projecting into the interior of said boiler and concentric with said larger diameter, and on said smaller neck 3 is screwed a cage 4, which retains in operative position the valve 5. To receive said valve 5, whose function will be described farther on, a passage 6 is provided in the neck 2, which leads into the chamber 7 in the valve-body B above the check-valve 8. The latter is of the usual construction and is guided in its movements away from and toward its seat 9 by the vertical wings 10, common to valve constructions of this description and cast on the body of the valve. Said check-valve is provided with a projection 12 on the upper side thereof and centrally located thereon. The valve-body B is provided with an opening 13 above said check-valve 8, through which said valve may be introduced in the valve-body B and applied to its seat, and a screw-cap 14 closes said opening. On the under side of said cap 14 is a depending projection 15, located over the projection 12, and the length of said projection 15 determines the degree to which said check-valve 8 shall be permitted to rise above its seat.

A passage 16 in the valve-body B is provided, which extends from the inlet 17 to the opening through the valve-seat 9 and communicating when the check-valve 8 is raised off from its seat with the chamber 7 in said valve-body, and from thence through the passage 6 into the boiler, as indicated by the arrows applied to Figs. 3 and 4.

The valve 5, above referred to, seats against the inner end of the passage 6 in the valve-body B, as shown in Fig. 5, and said valve is provided with the wings 18 to hold it in line axially with said passage 6 and to provide passage-ways for the feed-water through the passage 6 when said valve 5 is off from its seat, and projecting from the end of said valve 5 within the valve-body is the stem 19 and integral with said valve. This stem is preferably made square, as shown in Fig. 4, and enters a square socket in the end of the spindle 20, which is supported in the valve-body for movement toward and from the inner end of the valve 5 and axially in line therewith. For the support of said spindle a hole 21 through the valve-body B is provided, in which the spindle 20 may freely move. Said hole is counterbored and screw-threaded for the reception of a packing-nut 22, in the head of which the

threaded outer end of said spindle has a screw engagement, and between the inner end of said packing-nut and the bottom of the counterbore a packing 23 of a suitable nature and a compressing-ring 24 are located, the end of the said packing-nut 22 bearing on said compressing-ring 24. By screwing up the nut 22 the ring 24 compresses more or less the packing 23 around the spindle at a point beyond the threaded part thereof. The end of said spindle projects beyond the end of the packing-nut 22, and a hand-wheel 25 is secured thereto, whereby it may be operated.

The stem 19 of the valve 5 is made square for engagement with the square socket in the end of the spindle 20 for the purpose of providing means for turning the valve 5 in its seat should it become clogged or should any impurities in the water form on said seat and prevent the tight closing of the valve. Normally the said valve 5 is positively held open by the spindle 20, as shown in Figs. 1 and 3, and the feed-pump or injector may then be run uninterruptedly to feed water to the boiler, said valve being held in said open position by screwing the spindle 20 into the valve-body as far as may be necessary. Should it become necessary for any purpose to open the valve-body to remove the check-valve 8 for grinding it or to grind its seat 9, then the spindle 20 would be screwed out until the valve 5 comes to a seat, closing the passage 6 by means of the pressure of steam in the boiler, and any repairs can then be effected, as above stated.

This construction obviates the necessity of reducing the pressure in the boiler to effect repairs on any part of the boiler connection outside of the neck 3, and as said check-valve is subjected to very hard and constant use such repairs are not infrequent. Furthermore, in case the herein-described construction is in use on a locomotive-boiler or portable boilers of any other description in cases of accident the boiler connections are liable to be broken off, and should this valve-body B be broken off the steam-pressure would at once close the valve 5 and thus prevent the scalding of any one near by.

In Fig. 5 is shown what parts of the valve construction can be removed therefrom while full pressure remains on the boiler.

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

1. A check-valve body, a dividing-partition therein, an inlet to, and an outlet from said body, on opposite sides of said partition, an opening through the latter, a check-valve controlling said opening, a valve located in and adapted to close said outlet by pressure external to said valve-body, a support for said valve on which it has a free sliding movement, and whereby it may be forced, and held, off from its seat, and means for connecting the inlet end of said valve-body with the feed-pipe of a pump or injector and for connecting said outlet end thereof with a steam-boiler, substantially as described.

2. A check-valve comprising a body having a screwed neck for attachment to a boiler, a valve closing the passage through said neck to said boiler, and means for supporting said valve in axial alinement with said passage, consisting of a screw-rod on the end of which said valve may have a longitudinally-sliding movement, and whereby it may be forcibly moved in one direction, an inlet-nozzle communicating with a passage leading to said neck, a check-valve in said passage, and a removable cap in said body opposite said check-valve, whereby the latter may be operated for regrinding the same while the valve in said neck is closed, substantially as described.

JOHN STROMVALL.

Witnesses:
H. A. CHAPIN,
K. I. CLEMONS.