(No Model.)

J. H. BLESSING.

VALVE.

No. 272,634. Patented Feb. 20, 1883.

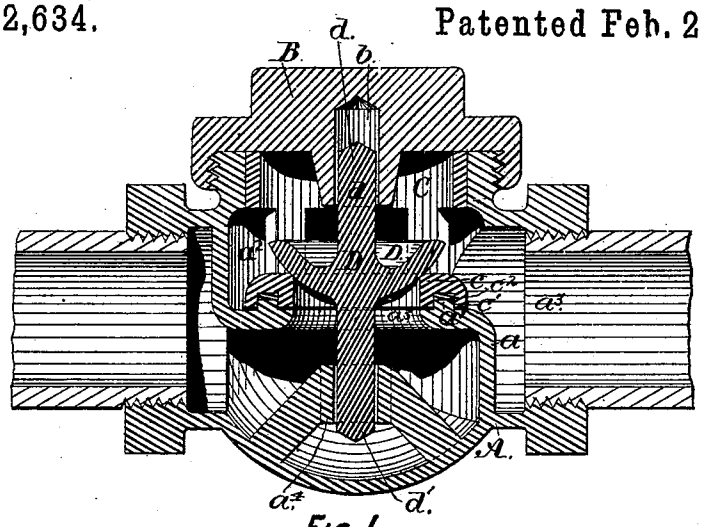


FIG. 1.

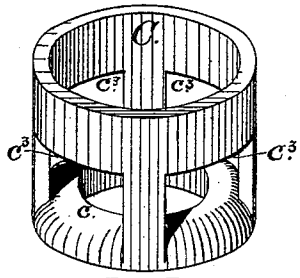


FIG. 3.

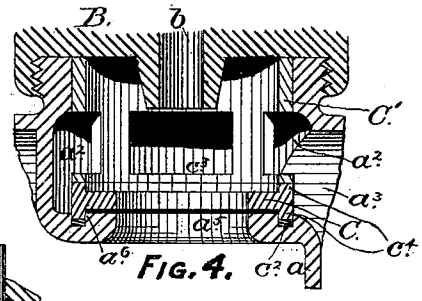


FIG. 4.

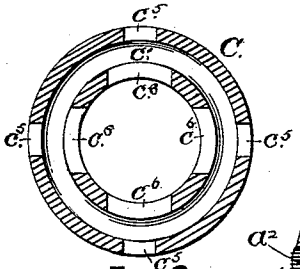


FIG. 6.

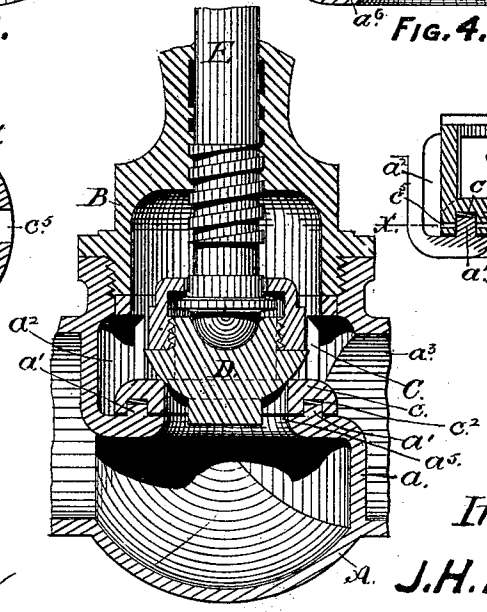


FIG. 2.

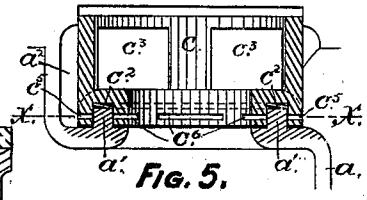


FIG. 5.

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UNITED STATES PATENT OFFICE.

JAMES H. BLESSING, OF ALBANY, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 272,634, dated February 20, 1883.

Application filed November 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BLESSING, of the city and county of Albany, in the State of New York, have invented certain new and useful Improvements in Valves, of which the following is a full and exact description.

My invention relates to improvements in puppet-valves and their seats; and the objects of my improvements are, first, to provide a valve-seat which, when it becomes impaired by use, can be readily removed from the valve-casing without displacing said casing or in any other manner disturbing the pipe in which the device is placed; second, to afford a temporary or additional seat for the valve during any repairs to or renewal of the removable valve-seat; third, to insure a perfect seating of the valve when from any cause the valve becomes tilted or thrown out of its true central line; and, fourth, to lessen the liability of the valves and seats of stop-valves becoming cut and leaky. These objects I attain by means of the constructions illustrated in the accompanying drawings, which form part of this specification, and in which—

Figure 1 is a longitudinal section of a globe check-valve containing my improvements; Fig. 2, a like view of a globe stop-valve containing said improvements; Fig. 3, a perspective view of the removable valve-seat detached from the valve-casing; Fig. 4, a longitudinal section of a modified form of my removable valve-seats and the parts of the valve-casing affected thereby; Fig. 5, a vertical section of another modification of my removable valve-seat that is especially designed for steam stop-valves, and Fig. 6 a horizontal section at the line *x x* of Fig. 5.

One of the most palpable and best-known defects inherent to globe-valves as commonly made is the liability of the valve-seat to become cut and worn out of truth, so that the valve will not close upon it to form a tight joint therewith, and as, in most instances, the valve-seat forms an integral part of the valve-casing, when repairs are required to be made to the valve-seat, the pipes to which the valve is connected have to be taken apart to permit of the removal of the device for that purpose. In effecting this, much valuable time is lost and expensive delays to business frequently occur. By my improvements this defect is remedied.

As represented in the drawings, A is the valve-casing, made in the ordinary "globe" form, and provided with the usual partition, *a*, the horizontal portion of which ordinarily serves as a valve-seat for the device; B, the cap or "bonnet" of the casing A. As shown in Fig. 1, said cap serves as a guide for the upper stem of the valve; but as shown in Fig. 2, it forms a nut for the screw-stem for operating the valve. C is a removable valve-seat, preferably made, as shown in Figs. 1, 2, 3, and 5, in a cylindrical form, with an annular flange, *c*, projecting inwardly to form a seat for the valve. Said removable seat is provided on its under side with an annular groove, c', adapted to fit over a corresponding tongue, a', formed on the horizontal portion of the partition *a* of the casing. A packing, c^2, of india-rubber or other elastic material, is fixed in the groove c', for the purpose of forming a tight joint with the annular tongue a'. A series of openings, c^3, are formed in the cylindrical body of the valve-seat C, so as to communicate with the annular passage a^2 leading into the eduction-opening a^3 of the valve-casing. The valve-seat C is held in position centrally in respect to the casing A, at its upper end, by the opening through the top of the casing, and at its lower end by means of the annular tongue a'; and, when preferred, said seat may be so fitted that cap B will force it down into close contact with the packing c^2 and form a tight joint at that point.

As shown in Fig. 1, the valve D is of the "puppet" variety. The face of said valve is made in the form of a segment of true sphere, for the purpose of insuring a perfectly-tight joint in a seat having a true circular opening whenever said valve may become tilted or "cock-billed." A stem, *d*, formed on the upper side of the valve D, is guided in opening *b*, formed in the cap B, and the stem d' on the lower side of said valve is guided in the steadiment a^4, formed in the lower part of the valve-casing. As shown in Fig. 2, the valve D, made in the segmental form above described, is attached to a screw-stem, E, in such manner, as

shown in the drawings, that while securely connected to said screw-stem it will have sufficient play to freely adapt itself to the seat when slightly tilted.

Whenever, from any cause, the bearing for the valve on the removable seat C becomes defective, said seat can be readily removed from its place by first removing the cap B and valve D and then lifting said seat from the casing. A new seat, C, may then be substituted for it; or, while the old seat is undergoing repairs, the circular opening a^5 in the horizontal portion of the partition *a* may be temporarily used for a seat for the valve D.

By making the face of the valve D of a true spherical form I am enabled to secure a perfectly steam-tight fit in a seat having a true circular hole without having recourse to the usual grinding required on valves having a different form of face, and I find that when valves and seats are made in the form above described the parts are perfectly interchangeable. In the modified form shown in Fig. 4 the removable seat consists of an annular ring, C, having on both its upper and lower surfaces an annular tongue, c^4. Each of said tongues is fitted to engage in an annular groove, a^6, formed in the horizontal portion of the partition *a* of the valve-casing. Said annular groove is provided with a ring, c^2, of packing for the purpose of producing a steam-tight joint with the removable seat. A cylindrical shell, C′, which may be made either integral with the cap B or of a separate piece having a bearing against the under side of said cap, bears upon the uppermost tongue c^4 and secures the removable seat in its place.

The cylindrical shell C′ is provided with openings c^3, for the purpose described in respect to like openings in the removable seat shown in Figs. 1, 2, and 3. When made in the form last described the removable seat C is reversible, and may be used with either side uppermost, so that when one seat becomes defective a fresh one may be obtained by simply turning over the piece C.

In the modification shown in Figs. 5 and 6 the removable valve-seat C is provided with radial passages c^5 and c^6, which are cut through the annular flange *c*, and lead into the annular groove *c*′, in such manner that when the said seat is in its lowest position said openings will be entirely below the upper face of the annular tongue *a*′. When so constructed the cylindrical portion of said removable seat should not extend up far enough to bear against the cap B when the said seat is in its normal position; but it should have sufficient freedom to admit of a slight up-and-down movement of said part, so that it may be lifted by a subtruding pressure until the openings c^5 and c^6 will range above the face of the tongue *a*′ and allow steam to pass through said openings from beneath the valve D and into the eduction-opening a^3 before the said valve is raised clear from the valve-seat. This construction is designed to prevent the cutting away of the seats of stop-valves by the action of the steam-currents, which action I have discovered by experience to occur when the valve is but slightly opened to permit a small volume of steam to pass through, whereby the velocity of the flow between the faces of the valve and seat becomes so greatly increased as to produce a rapid abrasive action on the metals.

By making the inner openings, c^6, of greater area than the outer openings, c^5, as shown in Fig. 6, the steam will flow into the annular groove *c*′ with less velocity than it will have in passing out therefrom through the openings c^5, and by this means any abrasive action of the steam will be confined to the outer edge of the tongue *a*′, where its effect will be harmless. The operation of this last-described modification is as follows: The device being fixed in the steam-pipe so that the pressure will act against the under side of the valve, and then when said valve is raised slightly to permit a small volume of steam to pass through the pipes, the pressure, acting against the under side of the removable seat C, (for which purpose a clear space is left between said seat and the upper face of the partition *a*,) will force said seat to rise and keep in contact with the face of the valve. By this means the passages c^5 and c^6 will be opened for the passage of the steam therethrough, and in most cases in sufficient quantities to meet the requirements of a reducing-valve. When the valve has been raised far enough to bring the upper end of removable seat C against the cap B, any further elevation of the valve will cause a separation of said seat from the valve, and then, as the pressure against the upper and lower sides of said seat will be equalized, the seat C will gravitate into its normal position, where, when the valve is screwed down, it will form a steam-tight joint with the elastic packing c^2.

It will be observed from the description herein given that the removable seat C rests on the elastic packing c^2. For this reason, when said seat is applied to check-valves, wherein the pressure must always bear against the upper side of the puppet-valve, it is immaterial whether the top of said seat has a bearing against the cap B when the valve is closed or not. The pressure upon the upper side of the valve will always tend to keep the seat in close contact with the elastic packing, and this latter device is a valuable feature in check-valves, as it forms an elastic cushion to relieve the dead blow usually given by such valves when closing upon their seats.

I claim as my invention—

1. The combination, with a valve-casing, A, whose partition *a* is provided with an annular tongue *a*′, as herein described, of the removable valve-seat C, provided with an annular

groove, c', adapted to engage with the annular tongue of the valve-casing and maintain the centrality of said valve-seat, as herein specified.

2. The combination, with a removable seat, C, provided on its under side with an annular groove, c', and with passages c^5 and c^6, leading into and out of said annular groove, as herein set forth, of the annular tongue a' and packing c^2, as and for the purpose herein specified.

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Witnesses:
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