

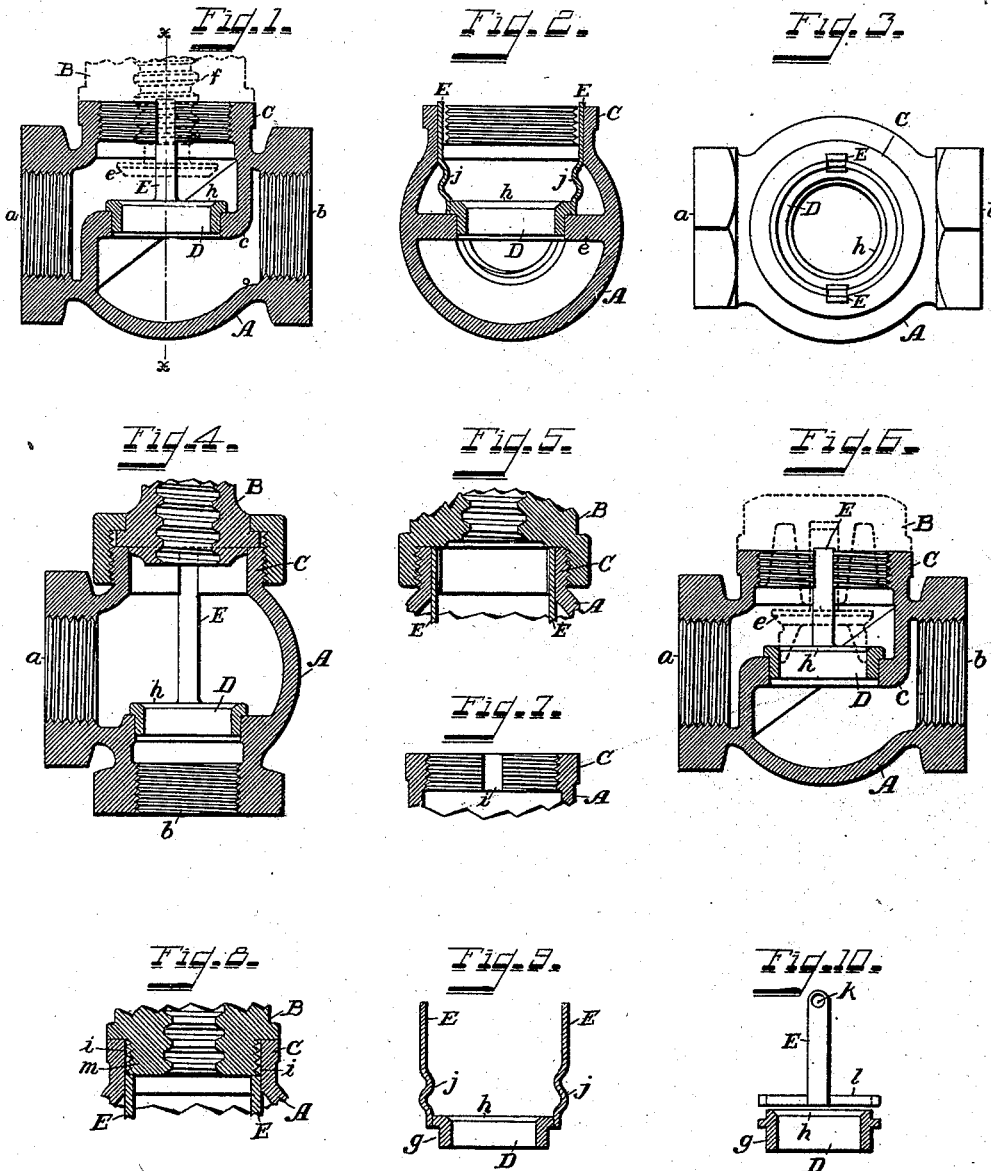
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Patented Apr. 10, 1900.

E. H. LUNKEN.
RENEWABLE SEAT VALVE.

(Application filed Dec. 4, 1899.)

(No Model.)



Witnesses.
Bernard J. Hausfeld
Edward Peck

Inventor
Edmund H. Lunken
by Chas. M. Peck
his Attorney.

UNITED STATES PATENT OFFICE.

EDMUND H. LUNKEN, OF DENVER, COLORADO, ASSIGNOR TO THE LUNKEN-HEIMER COMPANY, OF CINCINNATI, OHIO.

RENEWABLE-SEAT VALVE.

SPECIFICATION forming part of Letters Patent No. 647,192, dated April 10, 1900.

Application filed December 4, 1899. Serial No. 739,185. (No model.)

To all whom it may concern:

Be it known that I, EDMUND H. LUNKEN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Renewable-Seat Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to that class of valves among which may be enumerated globe-valves, check-valves, in the form of globe and angle valves, and, in short, all that class of valves having an inlet-opening, a pipe-opening, and an interposed-valve-seat opening, with a valve-seat covered by a valve that moves to and from its seat always in planes parallel with the plane of the seat; and it has for its object the provision of a removable and renewable seat for this class of valves which can be readily applied and removed without trouble or loss of time and without disconnecting the valve from its pipe-fittings, thereby greatly increasing the efficiency of the valve and prolonging its life.

The novelty of my invention will be hereinafter set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is an axial side elevation of so much of a globe-valve as is necessary to illustrate my invention. Fig. 2 is a transverse elevation of the body of the valve on the dotted line *xx* of Fig. 1. Fig. 3 is a plan view of Fig. 2. Fig. 4 is a sectional side elevation of so much of an angle-valve as is necessary to show the application of my invention. Fig. 5 is a central sectional elevation through the neck of the valve, showing a modification wherein the bonnet or cap is interiorly threaded to screw upon the exteriorly-threaded neck of the valve. Fig. 6 is a central sectional side elevation of a check-valve in globe form embodying my invention. Fig. 7 is a sectional elevation of the neck in detail to show more clearly one of the recesses in the threaded part of the neck, into which one of the arms for the ring-seat is seated deeply enough so as to not interfere with the threads of the bonnet or part thereof which screws into said

recessed thread in the neck of the valve, and thus passes over the recessed arms without coming in contact with or interfering with their action and also to prevent any twisting strain upon the arms. Fig. 8 represents a modification in the neck construction of the valve wherein an internal plug or hub on the bonnet is employed for engaging the upper ends of the ring-seat arms. Fig. 9 is a sectional side elevation of the ring-seat for the valve and its securing-arms in one piece. Fig. 10 is a view at right angles to Fig. 9, showing the securing-arms attached to a ring and with the ring-seat beneath the same as a separate detachable piece.

The same letters of reference are used to indicate identical parts in all of the figures.

In Figs. 1 and 2, which represent an ordinary globe-valve or so much thereof as is necessary to illustrate my invention, A represents the body, with opposite pipe-openings *a b* to form inlet and outlet openings for the valve. Within the body between these openings *a b* is the usual diaphragm *c*, having through it an opening containing the valve-seat D, with which the valve *e* (represented by dotted lines) engages and is moved to and from the valve-seat to close and open the valve by the usual or any suitable stem *f* passing through and engaging with a cap or bonnet B, screwed to the neck C of the valve.

So far the construction described is that of any ordinary globe-valve, and I will now proceed to describe the application of my invention thereto.

Loosely fitted within the valve-opening in the diaphragm *c* is a removable ring-seat D, with an exterior rabbet or cut-out portion *g* to fit the opening in the diaphragm and with an upper interior beveled portion *h* to form the valve-seat with which the correspondingly-beveled lower portion of the valve *e* engages. In one of its forms the ring-seat D has integral with it two or more upwardly-projecting arms E, which are fitted into and are guided by recesses *i*, Figs. 3 and 7, in the neck of the valve, whether the same be threaded or not, and which arms extend up far enough to be engaged by the flange of the cap or bonnet B of the valve, so that when the latter is screwed down to place it engages the tops of

the arms E and forces same downward to cause the ring-seat D to snugly adhere to the opening in the diaphragm of the valve to prevent leakage. These arms E may be nicked or corrugated, as at *j*, Figs. 2 and 9, so as to be longitudinally compressible and thus be in a measure elastic when the cap or bonnet is screwed down. As a substitute for these nicks or corrugations the upper ends of the arms may be perforated, as seen at *k*, Fig. 10, to enable the longitudinal yielding or compression of the arms and also to serve as a means for introducing a hook or other tool by which the arms and ring-seat or ring carried by the arms can be withdrawn from the valve-body to enable a new ring-seat to be applied, as will be readily understood.

As seen in Figs. 1 and 2, the ring-seat and arms may be integral, and, as seen in Fig. 10, they may be detachable with an upper ring *l*, carried by the arms E, fitting upon a rabbeted portion of the ring-seat D just outside of its seat *h*, as shown particularly in Fig. 10.

In Fig. 4 the invention is shown as applied to an angle-valve of well-known form of construction, and wherein the ring-seat and arms may be integral or separate, as in the globe form above described.

Again, in Fig. 6, I have shown a well-known form of check-valve to which my invention is applied; the cap or bonnet being indicated by dotted lines and only the usual guide-wings for the valve being employed.

In Fig. 8 I have shown a form of cap or bonnet having an inwardly-projecting screw-plug *m*, which bears upon and forces down the tops of the arms E, and in Fig. 5 I have shown the bonnet B as having a threaded flange engaging the outer side of the neck C, in which case the arms E extend far enough up to be engaged by the inner projecting lower side of the cap or bonnet.

I have thus shown the application of my invention in a variety of ways to a variety of forms of valves, but do not intend that the same shall be limited thereto nor that my claims, in terms, should be confined to the same, as the leading features of my invention are the location of the removable valve-seat with reference to the valve which engages it, the arms that hold said seat to its place in the seat-opening of the valve whether the arms are integral with the valve-seat or are attached to an intermediate ring that engages the seat; also, in so guiding the arms and in supporting them in the neck of the valve in recesses that no torsion or twisting is exerted upon them in securing the cap or bonnet in place and whereby the valve-seat will always be seated true and will remain so under all circumstances, the whole forming a very simple and efficient means of applying renewable seats to this class of valves, which will render them perfectly efficient in action and will greatly prolong their life and utility.

As another valuable feature of my inven-

tion it is to be observed that neither the size of the valve body or shell or its neck is in the least increased or enlarged nor is the opening or passage-way through the valve in the least restricted, owing to the fact that the arms that hold the renewable valve-seat are at one side and do not in any way obstruct the passage of the valve, so that my invention is applicable to the standard sizes of the valves now on the market, to which it can be applied in a very simple and cheap manner. Also, while I have shown forms of valves where the caps or bonnets are screwed to the neck, yet it is well known in the art, particularly in the construction of iron valves, that these caps or bonnets are sometimes flanged and secured by connecting-bolts. Even in such cases my invention is perfectly applicable to these latter forms of valves and will be found very desirable in their use.

It will be seen from the foregoing that the two principal features of my invention are, first, to provide a holder for the renewable seat that does not in any way obstruct the passage-way of the valve, and hence the two arms are arranged at the opposite sides of the shell out of the passage-way of the valve, and, second, to provide means to prevent any turning or displacement of the arms, especially on account of the screwing down of the cap or bonnet. It is evident that any suitable stops for that purpose would answer just as well, and I therefore do not wish to be confined to any particular way of preventing the arms from turning.

Having thus fully described my invention, I claim—

1. In valve construction, in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a pair of arms, arranged opposite to one another on opposite sides of the passage-way, adapted to hold said ring-seat in place, means for preventing said arms from turning in position, and the valve which engages with the ring-seat, substantially as described.

2. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a two-armed non-revoluble holder for the ring-seat forced into place by contact with the cap of the valve, and the valve which engages with the ring-seat, substantially as described.

3. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, two arms holding the ring-seat in place, means for preventing the

arms from turning while the cap is being screwed down, and the valve which engages with the ring-seat, substantially as described.

4. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, two arms for holding the ring-seat in place and arranged opposite to each other at the sides of the body so as not to obstruct the passage-way through the same, a device for preventing the arms from turning out of position, and the operating-stem carrying the valve which engages with the ring-seat, substantially as described.

5. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held in guides in the neck of the valve and adapted to hold said ring-seat in place, and the valve which engages with the ring-seat, substantially as described.

6. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held and guided in recesses in the neck of the valve and adapted to hold said ring-seat in place, and the valve which engages with the ring-seat, substantially as described.

7. In valve construction having the operating-stem at right angles to the plane of the valve and its seat, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held in guides in the neck of the valve and adapted to hold said ring-seat in place, and the operating-stem carrying the valve which engages with the ring-seat, substantially as described.

8. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a separate ring engaging the ring-seat and carried by arms held in guides in the neck of the valve and adapted to hold said ring and ring-seat in place, and the valve which engages with the ring-seat, substantially as described.

9. In valve construction in which the valve

moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held in guides in the neck of the valve and provided with nicks or corrugations to permit their longitudinal compression and adapted to hold said ring-seat in place and the valve which engages with the ring-seat, substantially as described.

10. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held in guides in the neck of the valve and provided with apertures, said arms being adapted to hold said ring-seat in place, and the valve which engages with the ring-seat, substantially as described.

11. In valve construction of the character described, the combination of the removable valve-seat, arms supported and held from turning by slots in the neck of the valve and serving to hold the valve-seat to its place, a plug or cap engaging the neck of the valve and the upper ends of the seat-arms to hold the same down, substantially as described.

12. In valve construction of the character described, the combination of the removable valve-seat, arms recessed in the threaded neck of the valve and serving to hold the valve-seat to its place, a plug or cap engaging the threaded neck of the valve and the upper ends of the seat-arms to hold the same down, and a valve for the valve-seat, substantially as described.

13. In valve construction in which the valve moves to and from its seat in constantly-parallel planes, the combination of the body having inlet and outlet openings and an interposed-seat opening, a ring-seat fitted to said last-named opening, a plurality of arms held and guided in recesses in the threaded portion of the neck of the valve, said recesses being sufficiently deep to receive the arms without interfering with the action of the thread in the neck, and said arms adapted to hold said ring-seat in place, and the valve which engages with the ring-seat, substantially as described.

EDMUND H. LUNKEN.

Witnesses:

OWEN N. KINNEY,
EDWARD PECK.