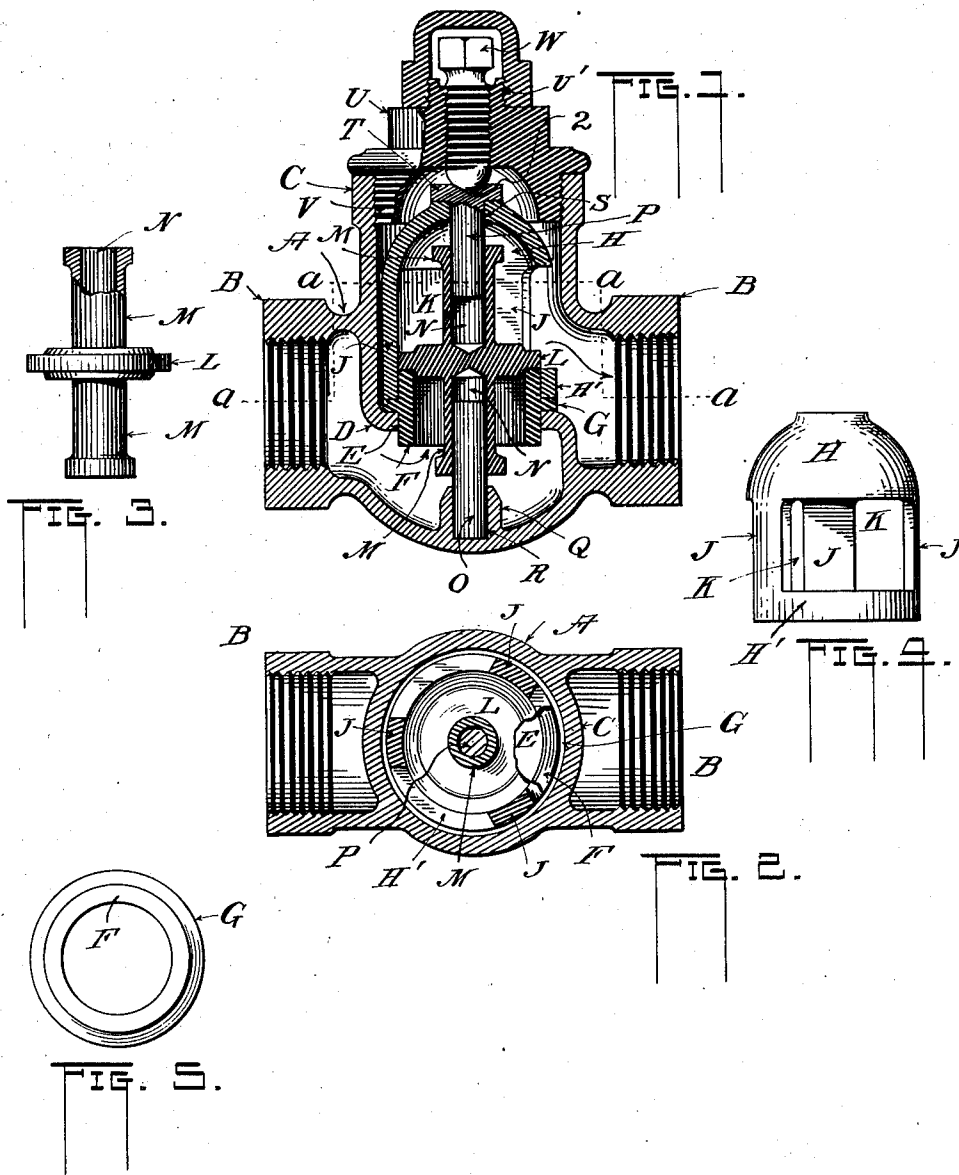


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VALVE.

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VALVE.

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To all whom it may concern:

Be it known that I, SAMUEL A. KINSEY, Jr., a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Valves; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in valves and pertains to an improvement adaptable to many forms of valves such, for instance, as check valves, angle valves, globe valves and others.

The invention also pertains to improvement in a valve having a reversible part or parts in which the ground or seating surfaces thereof that may have become damaged so as to permit leakage, can be reversed in position to provide new and perfectly seating faces.

An object is to construct a valve whose parts often necessary to be ground may be entirely removed and ground in assembled form outside the valve-body so that the grinding agent is kept outside the valve-body and not permitted to pass into and through the pipe system, the construction of the parts of the valve being such that during the grinding their surfaces will be maintained in exactly the same relative position as when in place in the valve thus insuring that when replaced said surfaces will seat perfectly tight. Other objects will appear in the following specification.

It is well known that when a valve-seat or the valve resting thereon become damaged in any way so as to permit the fluid passing therethrough to leak between the ground faces it is necessary to regrind the surfaces in order that they may be made to seat perfectly and prevent such leakage.

It is also well known that in some of the older forms of valves the grinding and re-seating must take place within the valve-body this being done usually by means of oil and emery and this method is detrimental to the pumps, engines or other apparatus with which the pipe system is connected since the emery, which cannot always be entirely removed, is carried along into such apparatus by the fluid. It is well known, also, that after a valve-seat has been ground a number of times it is finally rendered unfit

for further use for obvious reasons making it necessary to remove the valve-body from the pipe and substitute a new one.

As already stated it is my purpose, in view of the foregoing, to provide a valve which will have both a removable and a reversible seat and a removable and reversible valve-member having provision for perfectly guiding and fitting them outside the body and by furnishing both these members with two ground faces I provide a number of changes for said members without the necessity of immediately regrinding the damaged seating surfaces but if to be ground at once the members can be removed and ground entirely outside the valve-body and that when the parts have been ground and reground a number of times and to such an extent as to render such parts of no further use they can be replaced by new ones at a nominal cost and without providing an entirely new valve-body as is usually necessary.

In the accompanying drawing:—Figure 1 is a vertical longitudinal section of a check-valve showing the invention in connection therewith. Fig. 2 is a horizontal section of the same on line *a-a* Fig. 1. Fig. 3 is an elevation of the valve proper which is shown in part section. Fig. 4 is an elevation of a hood employed for holding the valve-seat in position. Fig. 5 is a plan of the valve-seat.

A indicates the valve-body of either form provided with the internally threaded extremities B for connecting with the pipes, the latter not being shown. The body is further provided with an internally threaded extension C which ordinarily receives the stem, for instance, of the globe valve form and through which the interior of the valve-body is reached for grinding purposes. In the present instance, the extension C on any form of valve is made of large diameter in order that the valve proper and the valve-seat to be described can be readily inserted and removed.

The interior of the valve is provided with the usual partition diaphragm D having an aperture E for the passage of fluid from one side of the valve to the other. On this wall the valve-seat is usually formed, its upper face being ground true to form a seat for the valve. In my valve this partition is turned off true and the aperture is provided with a smooth bore and into said bore

is inserted a tubular member or collar F of some length which constitutes the valve-seat both of whose ends the upper and lower, are tried and properly ground to receive the valve to be described presently. The said collar or seat has a circumferential flange G (Fig. 5) both of whose upper and lower faces are turned off true and either of which is adapted to rest upon the wall or partition D in such a manner as to prevent leakage between the collar and the said wall or partition. Seated upon the flange G is a hood H (Fig. 4) comprising a dome shaped upper portion; its lower portion consisting of a ring H' which bears upon said flange G. The ring H' and the dome are connected by legs J which are spaced apart to provide the openings K for the passage of fluid.

The valve hereinbefore referred to comprises a disk L, Fig. 3, provided with an upper and lower flat face both properly ground to rest upon the surfaced top of the collar F, or seat, whereby the two form a fluid tight joint. At each side of the disk L is an extension M each having a bore at N whose axes are perpendicular to the plane of the disk and said bores are provided to receive two vertical stems to act as guides, the lower one being indicated by O and the upper one by P. Cast in the bottom of the valve-body is a boss Q vertically bored at R forming a socket to receive said stem or guide O. The dome H of the hood hereinbefore mentioned is centrally bored at S and the guide or stem P referred to extends therethrough and has a head T to rest upon said dome. A plug U is provided for the top of the valve-body and has a threaded shank V to engage the threads of the extension C. Extending centrally through said plug is a set screw W having a rounded end adapted to seat in a depression 2 in the head T of the guide or stem P. Said plug U is further provided with a threaded stem U' at its top to receive an internally threaded cap 3 to cover and protect the screw and prevent chance leakage. It will now be seen that the collar or seat F is firmly and rigidly held in position on the partition D by means of the hood HH' and remains permanently in position during the time the valve is assembled and in use and the means which holds said seat in position through the hood is the set screw W described bearing upon the head T of the stem P.

The direction of flow of the fluid is indicated by the arrows. It passes through the seat F and lifts the disk L against the force of gravity, said disk being guided in its vertical movements by the studs OP and having passed beneath the disk the fluid finds its outlet between the legs J of the hood HH'. So long as the under face of the valve disk L and the upper face of the seat E fit perfectly and are not cut or damaged in any

way a fluid tight joint will be maintained. However, if through any cause the surfaces are defaced so as to permit leakage between them, the plug U can be removed which will liberate the valve disk, the stem P, and the hood HH' all of which can be lifted from the valve-body after which the valve seat F can be removed. The surfaces of these two members which have been in contact can then be ground to fit and then replaced in the valve after having cleaned them thoroughly of the emery or other grinding agent employed, or, in place of grinding the surface the member whose surface has been damaged can be inverted and then by replacing the parts the valve is ready for use. It will be seen that by having both surfaces of the valve disk and both ends of the valve-seat provided with ground surfaces four changes may be made before it becomes necessary to do any grinding or re-seating in case the attendant has other more pressing duties to attend to the grinding and re-seating being done when the pipe system is idle. After many regrindings and the valve-disk and seat have become too much worn to be further used they may be replaced by new ones at a very nominal cost thereby making it unnecessary to replace the valve-body by an entirely new one.

My form of valve is readily applicable to any kind of valve for any purpose and besides the advantages enumerated there is the further advantage that no internal projections are present in the valve such as would retard the free passage of fluid therethrough and the structure or equivalent thereof may be utilized in angle valves, or valves of any particular or peculiar shape and the invention contemplates any structure that will provide a valve having the several advantages outlined. While grinding the valve and valve-seat when removed from the valve-body, the hood H serves as an excellent means of holding the members in their relative positions or the positions they occupy while in service so that their surfaces will always be ground accurately. The said hood serves to centralize the members during the grinding operation.

I am aware that the art shows a removable valve-seat held in place against the underside of the diaphragm of a valve by a member held against it by a plug or closure in the bottom of the valve opposite the opening of said diaphragm. Such an arrangement, however, involves a complication of structures and is expensive besides having many parts to care for and keep tight for preventing leakage. My device, however, does not depend upon and does not utilize a second closure since a single closure at the top of the valve, through which, in one of its forms, the valve stem extends, is also associated with the means for holding the

valve seat in place through the member J, and further, by an adjustment the pressure is variable upon the seat whereas that of the device referred to is not variable since it is made tapering in form and therefor allows no such variable pressure.

I claim:—

1. The combination with a valve-body provided with an open side and having a dividing diaphragm provided with a passage, of a valve-seat, a member to bear upon and hold the valve-seat upon said diaphragm and removable through said open side, a closure for the open side, a member extending through and outside the closure and adapted for adjustment from outside the valve-body and arranged to hold the first member with variable pressure upon the valve-seat, a valve having an extension at opposite sides, and guiding means above and below the diaphragm extending axially of the passage of said diaphragm to engage the extension of the valve.

2. The combination of a valve body having a dividing diaphragm provided with a fluid passage, an invertible valve seat in said passage and having two bearing faces, a tubular member resting upon the seat to hold it in position and slidably inserted into the body upon said seat, a closure for the top of the body, a member extending through and outside the closure and adapted for placing pressure upon the tubular member and valve seat and an invertible valve slidably fitting the interior of the tubular member.

3. The combination of a valve body having a dividing diaphragm, provided with a fluid passage, an invertible ring seated in said passage and having two bearing faces, a tubular member seated upon the ring to hold it in position and slidably inserted into the body upon said ring, a closure for the top of the valve-body, a guiding member extending through the top of the said tubular member, adjustable means carried by the closure and adapted to hold the guiding member and the tubular member in position, a guiding member extending up from the bottom of the valve-body, and a valve comprising a member having an extension at each side adapted to engage the said guiding members.

4. The combination of a valve-body having a dividing diaphragm provided with a fluid passage, an invertible ring seated in said passage and having two bearing faces, a tubular member seated upon the ring to hold it in position and slidably inserted into the body upon said ring, a closure for the top of the valve-body, a guiding member extending through the top of the said tubular member, adjustable means carried by the closure and adapted to hold the guiding member and the tubular member in position,

a guiding member extending up from the bottom of the valve-body, and an invertible valve comprising a member having an extension at each side adapted to engage the said guiding members.

5. The combination of a valve-body having a dividing diaphragm provided with a fluid passage, a ring seated in said passage and adapted to be inverted and having two bearing faces, a tubular member seated upon the ring and having a top portion, a guide depending from the said top, a closure for the top of the valve above the tubular member, a screw carried by the closure and adapted to hold the tubular member and the guide in position, a guide extending up from the bottom of the valve-body, and an invertible valve consisting of a member having a bearing face at each side, and oppositely located extensions at two opposite sides to engage the guides.

6. The combination of the body of a check-valve having a perforate dividing diaphragm, a removable valve-seat extending through said diaphragm and having a flange between its ends to rest thereon, an open tubular member to slidably enter the body and rest upon the flange, a valve having oppositely located extensions, an extension uprising centrally from the body to slidably engage one of the valve-extensions, a depending extension centrally carried by the tubular member and adapted for engaging the other valve extension, and a screw disposed centrally above the tubular member to hold it with pressure upon the flange of the valve seat.

7. The combination with the body of a valve having a perforate dividing diaphragm, and a socket disposed opposite the opening of said diaphragm, the axes of the opening and socket substantially coinciding, a valve carrying a central extension on one of its faces, and a removable member seated in said socket, the extension having slidable engagement therewith.

8. The combination of a valve-body having a dividing diaphragm provided with an opening, a removable valve-seat lying freely upon the diaphragm at said opening, a valve, a member of open ring form resting upon the seat, a closure for the valve-body above the said member, an adjusting screw carried by the closure, a guide depending centrally from the member and having the screw in contact with it and maintaining pressure through it upon said member, a guide uprising from the valve-body beneath the diaphragm, both said guides adapted for guiding the valve in its movements.

9. The combination of a valve-body having a dividing diaphragm provided with an opening, a removable valve-seat lying freely upon the diaphragm at said opening, a valve having an extension on its upper and lower

side, a member in the form of an open ring resting freely upon the valve-seat and having a closed upper end provided with a hole, a stud extending through said hole into the interior of the member and resting freely upon the said closed upper end, a closure for the top of the valve-body above the member, a screw extending through and outside the closure and adapted to bear upon the said stud, and a stud uprising from the body beneath the diaphragm, both studs adapted by cooperating with the valve extensions for guiding the valve in its movement.

15 10. The combination of a valve-body having a dividing diaphragm provided with an opening, a removable valve-seat lying upon

the said diaphragm, a valve to rest upon said valve-seat, a dome-shaped member of open-ring-form at its lower portion engaging the said valve-seat, a closure for the valve-body above the said member, a guide for the valve depending from the member, and a device having threaded engagement with the said closure and adapted to cause the member to bear downwardly with pressure upon the said valve-seat.

In testimony whereof I affix my signature, in presence of two witnesses.

SAMUEL A. KINSEY, Jr.

Witnesses:

L. M. THURLOW,
EDWARD MARVILLE.