Aug. 23, 1932. H. M. NEORR 1,872,792

VALVE

Filed Jan. 12, 1927

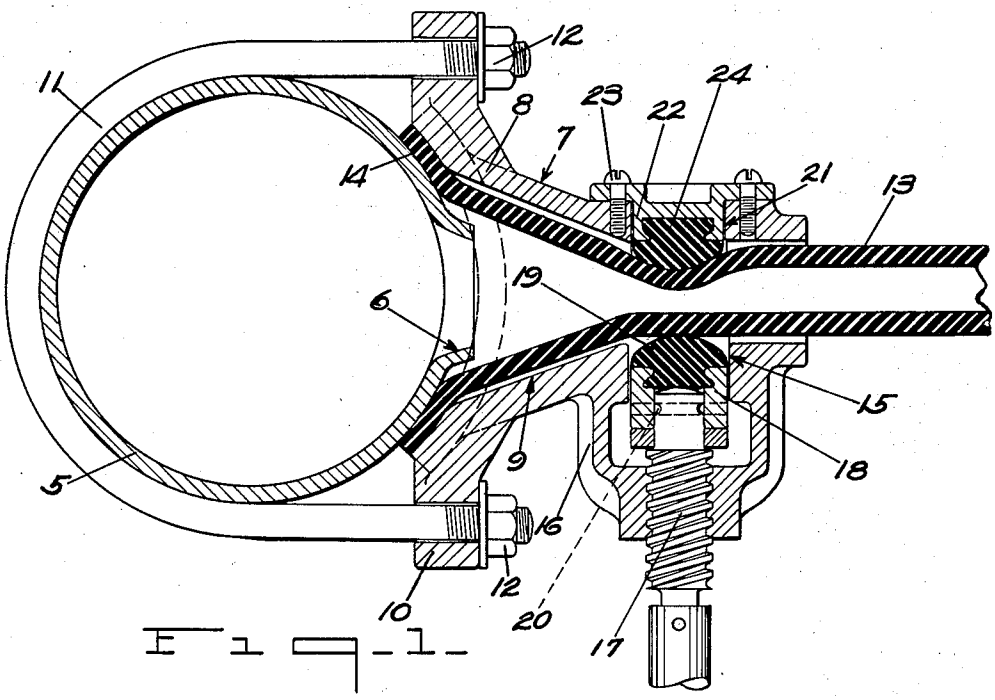


Fig. 1.

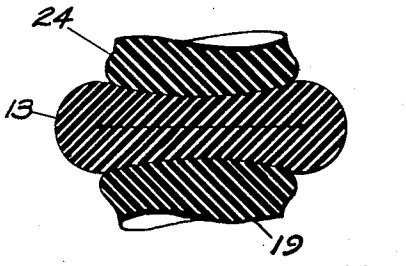


Fig. 2.

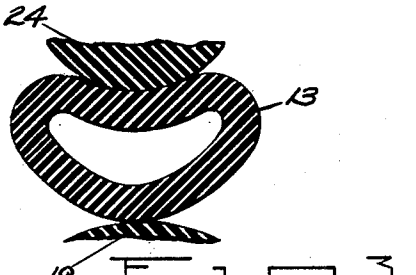


Fig. 3.

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UNITED STATES PATENT OFFICE

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VALVE

Application filed January 12, 1927. Serial No. 160,669.

The present invention relates to new and useful improvements in valves, and has more specific reference to a novel and simplified valve primarily constructed for use in systems employing various forms of abrasive.

In the grinding of plate glass various abrasives such as sand, garnet, carborundum, etc., are maintained in suspension in water, and are continuously circulated through a pipe at a relatively high speed, being tapped off at frequent intervals for use. This continuous circulation of the abrasive creates a severe cutting action on the parts of the system containing the same.

Ordinary types of valves have not been found entirely satisfactory in these systems as the abrasives wear away parts thereof so that in a comparatively short time the valve leaks and it is necessary to replace the same. Thus, the action of the abrasives upon the valve parts is very detrimental and renders the life of the valve very short necessitating frequent repairs and replacements. Although the particular valve provided by the present invention is primarily designed for use in such systems referred to above, it is in no way restricted to such use as it can be used wherever ordinary valves are now used.

It is an important object of the present invention to provide a valve which will efficiently withstand the wear of an abrasive passing therethrough.

Another object of the invention is to provide a valve including a housing, and a compressible member contained within the housing which is adapted to be compressed to control the effective opening thereof.

A further object of the invention is to provide such an improved valve of the above character having a compressible liner, and cooperating resilient members contacting with said liner for compressing the same whereby to control the effective opening thereof.

A still further object of the invention is to provide such an improved valve of the above character including a housing, a compressible member contained within the housing, and resilient members or pads contacting with said compressible member and cooperating with one another to compress the same, said resilient members or pads adapted to conform to the curvature of the compressible member when in its compressed position whereby to assure the complete closing of the valve.

Still another object of the invention is to provide such an improved valve of the above character having a compressible liner, cooperating resilient pads contacting with said liner, and means for moving one of said pads relative to the other pad for controlling the effective opening of said liner.

Other objects and advantages of the invention will become more apparent during the course of the following description when taken in connection with the accompanying drawing.

In the drawing forming a part of this application and wherein like numerals are employed to designate like parts throughout the same,

Fig. 1 is a longitudinal section through a valve constructed in accordance with the present invention showing the same secured in position.

Fig. 2 is a detail section showing the arrangement of the compressible member and resilient compressing members or pads when the valve is closed, and

Fig. 3 is a similar view showing the valve in open position.

Referring now more in detail to the drawing, the numeral 5 designates one pipe of a system adapted to contain a flow of abrasive, said pipe being provided with a lateral outlet opening 6.

The valve provided by the present invention is designated in its entirety by the numeral 7, and comprises a casing or housing 8 provided with a central bore 9, the inner end thereof being substantially cone-shaped, and adapted to aline with the opening 6 in pipe 5 when the valve is secured in position.

The inner end of the housing is provided with an annular flange 10 which receives therethrough the opposite ends of a suitable U-bolt 11, passing around pipe 5. Suitable nuts 12 engaging the opposite ends of bolt 11

serve to rigidly secure the housing to the pipe 5.

The housing 8 contains a removable hollow compressible member or liner 13, made of rubber or other suitable resilient material, which provides the regulatable passage for fluid through the valve. This liner is inserted into the housing through the inner enlarged end thereof, and the inner end of the liner is clamped between the housing 8 and pipe 5, as indicated at 14.

That portion of the liner indicated at 14 which is clamped between the housing and pipe serves also as a packing to prevent leakage of the valve. Even though the outer surface of the pipe 5 be somewhat uneven or roughened, the liner can be readily compressed to provide a tight fit and prevent leakage. Also, it will be noted that the inner end of the hollow liner 13 has an inner diameter slightly greater than that of the outlet 6 which permits a free flow through the valve and creates a flushing action to prevent clogging of the valve.

The housing 8 is further provided with a lateral opening 15 and surrounding this opening is a boss 16 through which is threaded the screw plunger 17, carrying at its inner end a valve head 18. This valve head 18 is formed with an under-cut groove within which is removably secured the resilient compressing member or pad 19 formed of relatively soft rubber or other suitable resilient material and which member or pad acts to compress the liner upon rotation of the plunger 17. The valve head 18 is detachably secured to the plunger 17 by means of pins 20 and should it be desired to remove the head 18 or plunger 17, it is simply necessary to remove the pins 20. The compressing member or pad 19 is adapted to snugly fit within the under-cut groove in the valve head 18 and is effectively secured therein by the resilient nature thereof.

The housing 8 is further provided with a second opening 21 diametrically opposite the opening 15 and received within the said opening 21 is a plate 22 removably secured in position by suitable screws or the like 23. The inner surface of the plate 22 is also provided with an under-cut groove within which is removably secured a second resilient compressing member or pad 24 similar to and adapted to cooperate with the first compressing member or pad 19. The second compressing member or pad is also secured in position by the resilient nature thereof.

It will be seen that the abrasive within the pipe 5 can readily flow therefrom through the opening 6 into and through the valve and that this flow of abrasive through the valve can be readily controlled by simply rotating the plunger 17 to compress or release the liner 13. The liner 13 which, as stated, is formed of rubber or other suitable material will effectively withstand the wear of an abrasive passing therethrough.

Prior to the present invention, it has been customary for the assignee company of the present application to employ a valve including a movable metallic valve head contacting with the liner for controlling the effective opening thereof. However, the constant contact with and pressure of the metallic valve head upon the liner has tended to wear away the said liner quite rapidly which has necessitated frequent replacements. Moreover, the metallic valve head contacting with the liner has failed to satisfactorily and completely compress the liner to close the valve with the result that a small amount of the abrasive would leak therethrough even when the valve was closed.

According to the present invention however, the cooperating compressing members or pads 19 and 24 are, as stated, formed of a suitable resilient material preferably relatively soft rubber and it will be apparent that compressing members or pads formed of such material will not injure the compressible liner nor tend to wear away the same as quickly as they would were they of metal. Moreover, when the resilient member or pad 19 is moved to compress the liner 13, the said members or pads 19 and 24 will conform to the natural curvature of the liner as clearly shown in Fig. 2. This will not only result in a more uniform distribution of the pressure exerted on the compressible liner but will furthermore serve to entirely compress the said liner to close the valve with the result that the flow of abrasive therethrough will be completely shut off and danger of any abrasive leaking therethrough eliminated.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred embodiment of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Claims:

1. A valve of the class described including a compressible member, and resilient non-metallic compressing members contacting with said compressible member and cooperating with one another to control the effective opening thereof, said resilient compressing members conforming to the curvature of said compressible member when the same is compressed.

2. A valve of the class described including a compressible member, and oppositely disposed resilient non-metallic pads for compressing said compressible member, said pads conforming to the curvature of said member when the same is compressed.

3. A valve of the class described including a compressible member, and resilient pads of relatively soft rubber for compressing said

compressible member, said pads adapted to conform to the curvature of said member when the same is compressed.

4. A valve of the class described including a compressible member, oppositely disposed cooperating rubber pads contacting with said compressible member, and means for moving one of said pads relative to the other pad for compressing said compressible member, said pads adapted to conform to the curvature of said member when the same is compressed.

5. A valve of the class described including a housing, a compressible member extending through said housing, a stationary rubber pad contacting with said member, and a second rubber pad also contacting with the compressible member and cooperating with the stationary pad for compressing said member, said rubber pads adapted to conform to the curvature of the compressible member when the same is compressed.

6. A valve of the class described including a housing, a compressible member extending through said housing, a removable plate secured to the housing and having a resilient surface contacting with said compressible member, and a movable valve head carrying a second resilient surface cooperating with the first resilient surface for controlling the effective opening of said compressible member.

7. A valve of the class described including a housing, a plate secured to said housing, a resilient pad carried by said plate and contacting with said compressible member, a movable valve head, and a resilient pad carried by said valve head and cooperating with the first mentioned pad for controlling the effective opening through said compressible member.

8. A valve of the class described including a housing, a compressible member arranged therein, a plate detachably secured to said housing, a resilient pad removably carried by said plate and contacting with said compressible member, a movable valve head, and a second resilient pad removably carried by said valve head and cooperating with the first mentioned pad for controlling the effective opening of said compressible member.

9. A valve of the class described including a housing, a compressible member extending through said housing, a plate removably secured to said housing, a rubber pad removably carried by said plate and contacting with said compressible member, a movable valve head, a rubber pad removably carried by said valve head, and means for moving the valve head and pad carried thereby towards and away from said first mentioned pad for compressing the compressible member, said first and second mentioned pads adapted to conform to the curvature of said member when the same is compressed.

10. The combination with a pipe having a lateral outlet therein, of a valve including a housing, a hollow compressible member arranged therein, means for securing said housing to said pipe with the compressible member in surrounding relation to said outlet, stationary and movable resilient pads engaging said compressible member at diametrically opposite points within said housing, and means for moving said movable pad toward and away from said stationary pad.

11. The combination with a pipe having a lateral outlet therein, of a valve including a housing, a hollow compressible member arranged therein, means for securing said housing to said pipe with the compressible member in surrounding relation to said outlet, stationary and movable resilient pads engaging said compressible member at diametrically opposite points within said housing, means for moving said movable pad toward and away from said stationary pad, and means for removably securing said pads in position.

12. The combination with a pipe having a lateral opening therein, of a valve including a housing having a laterally extending portion, a compressible member extending through said housing, a plate removably secured to said housing, a rubber pad removably carried by said plate and contacting with said compressible member, a movable valve head carried by said laterally extending portion, a rubber pad removably carried by said valve head, and means for moving the valve head and pad carried thereby towards and away from said first mentioned pad for compressing the compressible member, said first and second mentioned pads adapted to conform to the curvature of said member when the same is compressed.

13. A valve of the class described including a compressible member, and resilient non-metallic compressing means contacting with said compressible member for controlling the effective opening thereof, said resilient compressing means conforming to the curvature of said compressible member when the same is compressed.

Signed at Toledo, in the county of Lucas and State of Ohio, this 7th day of January 1927.

HARRY M. NEORR.