Feb. 12, 1924. 1,483,656

E. FISHER

VALVE

Filed Dec. 2, 1921 2 Sheets-Sheet 1

Fig. 1

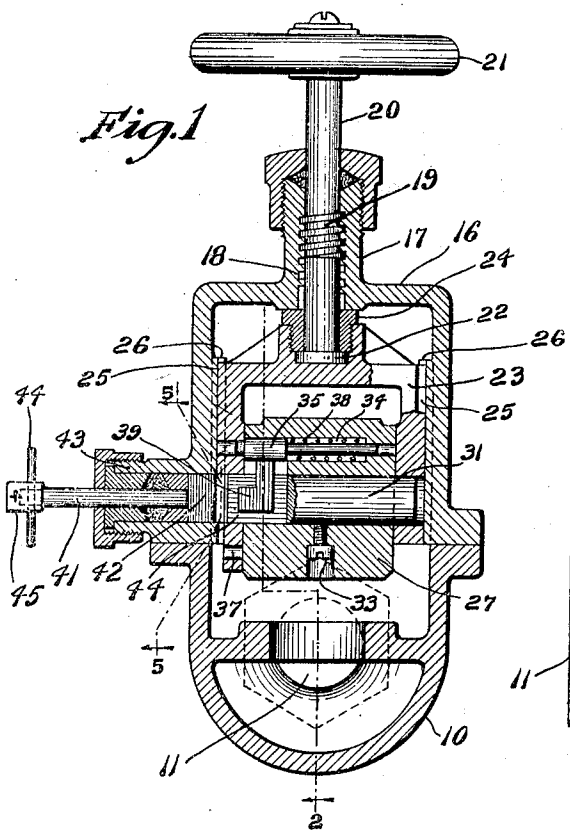


Fig. 2

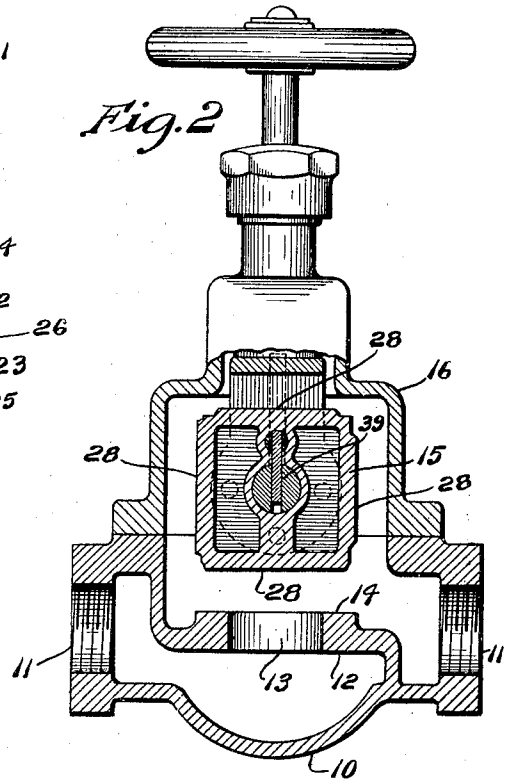


Fig. 3

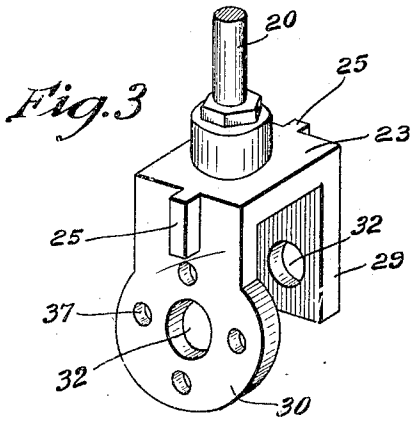
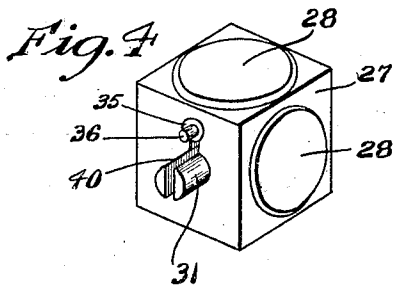


Fig. 4



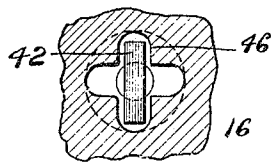


Fig. 5

Inventor

Emanuel Fisher

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VALVE

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Fig. 6

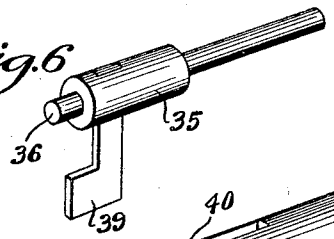


Fig. 8

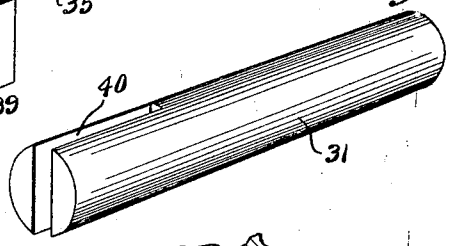


Fig. 7

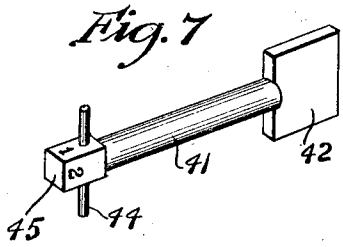


Fig. 9

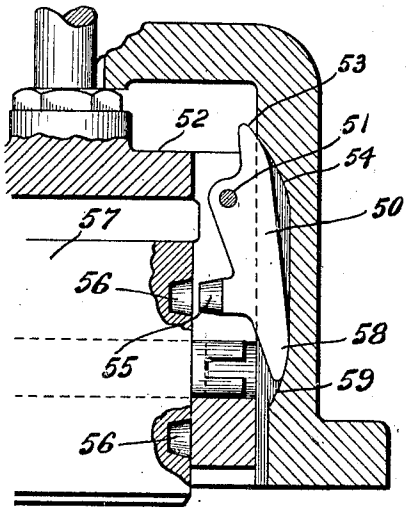


Fig. 10

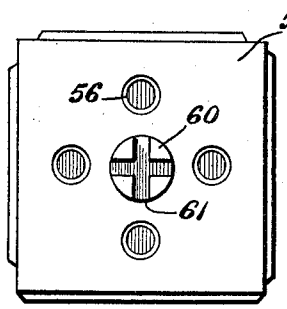


Fig. 11

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Attorney

Patented Feb. 12, 1924. 1,483,656

UNITED STATES PATENT OFFICE.

EMANUEL FISHER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO GEORGE W. O'KNEEL, OF PROVIDENCE, RHODE ISLAND.

VALVE.

Application filed December 2, 1921. Serial No. 519,488.

To all whom it may concern:

Be it known that I, EMANUEL FISHER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to improvements in the construction of multiple seated valves of the type more particularly adapted to be connected in a line of pipe to control the flow of fluid therethrough, and the object of this invention is to provide a multiple faced, rotatably mounted valve member in the valve casing, and having improved means whereby it may be positively locked in any of its several working positions against rotation and also to provide means for releasing the locking member when desired and rotating the valve from one operating position to another, and this invention is an improvement in the construction of such valves over my two prior Patents Numbers 1,157,641, patented October 19, 1915, and 1,157,642, patented October 19, 1915.

A further object of the invention is to guide the valve to land squarely upon its seat and that without engaging the seat with a rotating action.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a central sectional end elevation of my improved valve showing the rotatable member and the means for locking it in its different operating positions.

Figure 2 is a side elevation of the valve partly in section.

Figure 3 is a perspective view of the yoke in which the rotatable closure valve member is adapted to be mounted.

Figure 4 is a perspective view of the rotatable closure valve member which is herein shown as being made in the form of a cube.

Figure 5 is a section on line 5—5 of Figure 1 looking in the direction of the arrow showing the socket into which the flattened portion of the wrench is pocketed when withdrawn into inoperative position.

Figure 6 is a perspective view of the locking pawl showing its operating finger which extends into the slot in the valve pivot pin.

Figure 7 is a perspective view of the wrench which is adapted to enter the pivot pin, engage and withdraw the pawl, and also serve to rotate the valve member on its pivot to move a fresh seat face into operative position.

Figure 8 is a perspective view of the valve pivot pin showing the wrench receiving slot therein.

Figure 9 is a modification showing a binding set screw in the yoke adapted to engage the rotatable valve member to positively lock it in its various adjusted working positions.

Figure 10 is another modification showing a pawl for positively locking the rotatable valve in any of its adjusted working positions.

Figure 11 is an end view of a rotatable valve member shown in Figure 10.

It is found in practice in the construction of valves of this character of vital importance to so lock the rotatable valve member in its various operating positions in the casing that it cannot possibly be affected to be rotated by action of the fluid moving rapidly therethrough, and the following is a detailed description of one means by which this result may be accomplished:—

With reference to the drawigs, 10 designates the body portion of my improved valve which may be of that type which is adapted to be connected in a pipe line for controlling the flow of fluids therethrough, the same being provided with openings 11 at either end to which the pipe may be connected. Also this body is provided with a seat web or partition 12 through which is a passageway 13, the upper face of this partition being preferably a plain surface 14 against which the valve or closing member 15 seats. The upper portion of the casing 16 is connected by bolts (not shown) or otherwise to the body portion and this upper portion is provided with a neck 17 threaded at 18 to receive the threaded portion 19 of the operating stem 20. The outer end of this stem is provided with an operating handle 21 while its inner end 22 is provided with an enlargement rotatably connected to the yoke member 23 by a screw-threaded nut 24. This yoke member to which the stem is connected is best shown in Figure 3,

the same being provided with laterally-extending keys 25 to engage corresponding grooves or keyways 26 in the casing whereby the yoke is guided against rotation while being moved towards and from its seat.

Between the branches of this yoke is mounted a valve or closure member 27 which is preferably made hollow and in cube form provided with four different seats or working faces of different diameters, the smallest seat being used first, the valve then being rotated to use the next larger and so on progressively as the seats become worn or injured from use. As the sizes increase they naturally engage a fresh portion or area of the seat in the casing thus renewing the effectiveness of the valve with the presentation of each new seat.

This valve or closure member is provided with a transverse central opening through it and when positioned between the branches 29 and 30 of the yoke a pivot pin 31 is passed through this valve opening and the openings 32 in the yoke branches, and this pivot pin is secured in position in the valve by means of the set screw 33.

This valve member is also provided with a bore 34 whose axis is parallel with that of the pivot pin and spaced slightly apart therefrom and in this bore is mounted an endways sliding bolt 35 one end of which is reduced as at 36 to enter the four holes 37 in the yoke 23 this bolt being pressed to enter when presented to these holes by spring 38.

This bolt is provided with a laterally-extending finger 39 adapted to slide in slot 40 in the pivot pin 31.

In order to rotate this valve member and also simultaneously move the locking bolt from engaging position, I have provided a wrench member 41 having a thin blade 42 at its inner end adapted to enter the slot 40 of the pivot pin. This wrench is rotatably mounted in a boss 43 on the side of the valve casing, to extend through a packing gland and its outer end is provided with an operating pin 44 which passes through a squared portion 45 on which numbers appear, corresponding with those on the different faces of the valve member so that by looking at the wrench the relative positions of the seats may be at once determined. The socket portion 46, see Figure 5, of the casing in which the blade portion 42 of the wrench is housed when in inoperative position, is of such shape as to prevent the wrench from rotating. Therefore it will be seen that as the wrench cannot rotate except with the valve its numerals must truly indicate the relative position of the different seats in the valve.

By this construction it will be seen that when it is desired to rotate the valve to move a fresh seat into operative position it is only necessary to force the wrench inwardly which engages the finger 39 of the bolt, withdrawing the end of the bolt from engagement with its hole in the yoke after which the wrench is rotated one-quarter of a revolution to bring the seat of the next largest size into operating position after which the wrench is withdrawn and the bolt 35 is caused by its spring to enter the next opening 37 in the yoke again locking the valve against rotation. This seat may be used so long as it is tight, after which the yoke with its valve is raised to its extreme up position, as illustrated in Figure 1, which brings its pivot pin in line with the wrench member permitting it to be again inserted to rotate the valve to present another seat which is larger than the one previously used. This operation may be repeated until all of the seats have been used and that without removing the valve from the pipeline.

After all the seats have become worn it is only necessary to remove the upper portion of the valve casing, take out the valve block, reface all of the seats and replace the same, in which case the valve is ready for further service.

By providing the keys for guiding the yoke vertically in the valve casing I perform two important functions; first, I hold the valve against rotation as it is being forced against its seat, which prevents wearing, cutting or injuring the seat as the valve is forced thereagainst; and second, by this guiding device I absolutely align the axis of the pivot pin with that of the wrench so as to permit the wrench to acurately enter the slot 40 in the pivot pin when desired.

I have shown and described a construction of valve wherein a locking bolt is provided and is withdrawn automatically by the positioning of the operating key, but in some instances I may perform this positive locking action by the structure shown in Figure 9, which is that of providing a set-screw 47 that may be operated by a stem 48 and is first inserted into the valve so as not to lose its position. In other words, if the set-screw were withdrawn before the wrench 49 were positioned, the valve might be accidentally rotated on its axis out of its proper working position, in which event the casing would have to be removed to again locate and position it.

In still other cases I may provide a pawl member 50 as illustrated in Figure 10, which is pivoted at 51 in the yoke 52 whereby when the yoke is raised to its uppermost position the tail 53 of the pawl engages the wall 54 of the recess in the wall of the casing causing the engaging pin portion 55 of the pawl to be withdrawn from the socket 56 in the valve 57 thus permitting the wrench as illustrated in Figures 1 and 9 to be inserted to

rotate the valve on its pivot pin and as the yoke is again forced down the tail 58 of the pawl is caused to engage the tapered wall 59 of the casing forcing it back into the opening 56 in the valve block.

When a pawl of this character is provided the pivot pin 60 may be slotted if desired as at 61, to permit the tail of the pawl to enter when in operative position.

My improved valve is very practical in construction and effective in its operation and by its use the life of the valve is prolonged many times over that of the usual single seated valve.

The foregoing description is directed solely towards the construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In combinaton with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present its faces successively as desired to said seat, means for locking said valve against rotation, and means for contacting with said locking means for releasing the latter when the valve is in raised position permitting the valve to be freely rotated.

2. In combination with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present its faces successively as desired to said seat, means for positively locking said valve aginst rotation, means on the exterior of said casing for withdrawing said locking means and for rotating said valve when the same is unlocked if desired.

3. In combination with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present its faces successively as desired to said seat, an automatically actuated lock member for positively locking the valve against rotation, means on the exterior of said casing for withdrawing said lock member when the valve is in raised position and for rotating said valve when in unlocked position.

4. In combination with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present said faces successively to said seat as desired, said valve being normally locked against rotation, a member operable from the exterior of said casing for rotating said valve, and means for preventing the insertion or withdrawal of said member except when the valve is in locked position.

5. In combination with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present said faces successively to said seat as desired, a wrench mounted in said casing for rotating said valve and normally disconnected from said valve, and guiding means on the side of the casing for aligning said valve with said wrench.

6. In combination with a valve casing having a valve seat, a valve member having a plurality of working faces and adapted to be rotated in said casing to present said faces successively to said seat as desired, a lock for normally holding said valve against rotation, a member mounted in said casing adapted to be moved into position for rotating said valve, and means engageable by said member when moved into its operative position for moving said lock to release position.

7. In combination with a casing having a valve seat, a yoke in said casing, a valve member having a plurality of working faces and adapted to be rotated in said yoke to present said faces to said seat as desired, a spring-pressed bolt in said valve to enter a hole in said yoke and lock said valve in different operating positions, and means for withdrawing said bolt before rotating said valve.

8. In combination with a valve casing having a valve seat, a yoke in said casing, a valve member having a plurality of working faces and adapted to be rotated in said yoke to present said faces to said seat as desired, a spring pressed bolt in said valve to engage said yoke and lock said valve in different operating positions, a member mounted in said casing adapted to be moved to a position for rotating said valve, and means engageable by said member when moved into its operative position to withdraw said bolt from said yoke to release the valve.

9. In combination with a valve casing having a valve seat, a yoke in said casing, a valve member having a plurality of working faces and mounted on a pivot pin to be rotated in said yoke to present said faces to said seat as desired, a spring pressed bolt engaging said yoke to lock said valve in different operating positions, a key mounted in said casing adapted to be moved to a position for rotating said valve, and a finger connected to said bolt and extending into the path of movement of said key whereby the bolt is moved to release the valve as the key is being positioned to rotate the same.

In testimony whereof I affix my signature.

EMANUEL FISHER.