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WALL VALVE

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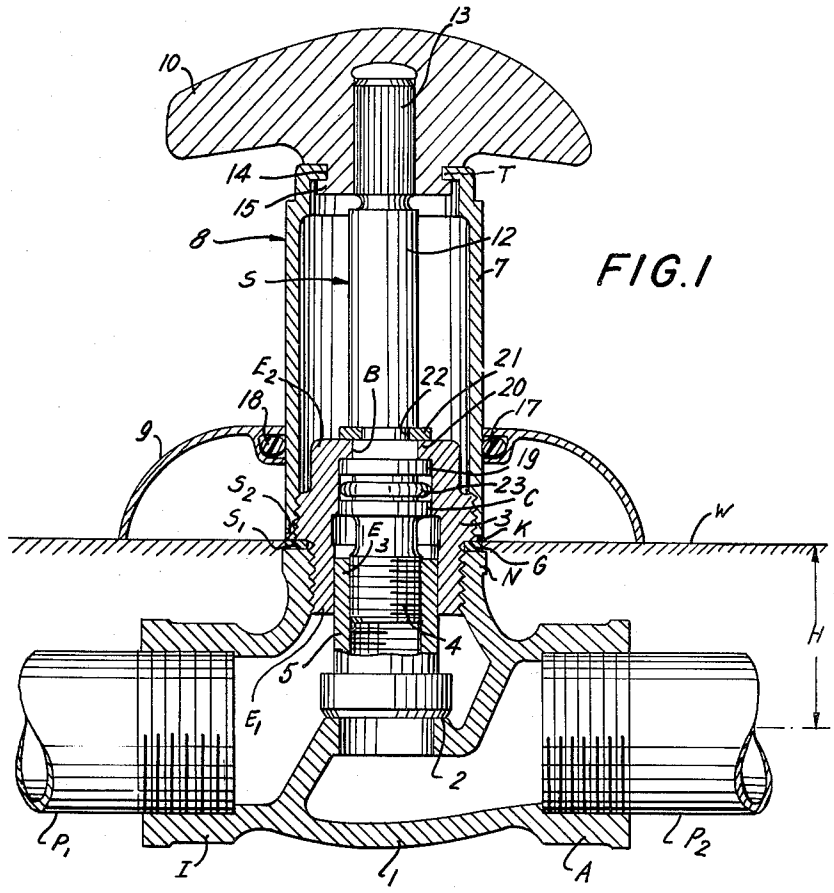


FIG. 1

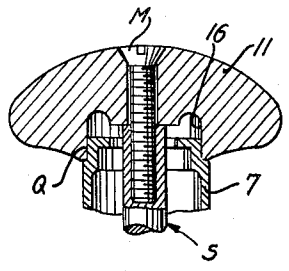


FIG. 2

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WALL VALVE

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This invention relates to hand operated valves, and more particularly to improvements applicable preferably to wall valve units so termed because they are concealed in the wall or the like except for the valve stem and the handle thereon projecting from the surface of the wall.

Heretofore, such valves had to be of special and relatively complicated construction asd therefore relatively expensive to manufacture, particularly involving complications in the mounting of the valve stem in the valve housing and the mounting of a wall shield surrounding the stem, as related to the surface of the wall. Prior constructions therefore have presented problems of installation inasmuch as the valve unit and the valve shield in particular had to be located in predetermined relation to the surface of the wall, and furthermore the problems of accessibility as well as servicing and replacement of the wearing parts. Also, properly locating and retaining the wall shield positioned against the wall surface has been a complicating factor.

It is therefore among the objects of this invention to provide a valve arrangement that is simple and inexpensive in construction, readily adaptable to varying wall conditions, as well as easily accessible and serviceable with simple and readily obtainable replacement parts, and furthermore mechanically strong and resistant even to rough manipulation of the handle.

To attain these ends, the invention provides an assembly containing all the moving parts readily removable as an assembly from the valve housing in the wall, and featuring a self-retaining wall shield which is axially slidable to adjusted positions on a tubular guide which surrounds the projecting portion of the valve stem and is otherwise rigid with the valve construction.

According to another aspect of the invention, the valve unit has a rigid tubular extension surrounding the valve stem, with a handle detachably fixed to the free end of the stem and centered on the outer end of the tubular extension whereby the projecting end portion of the stem as well as the handle are stabilized against angular displacement or tilting even in the case of rough manipulation. In this way, the stem is effectively guided along the exposed length thereof which, in the case of the aforementioned wall installation, renders the valve unit relatively more independent of wall conditions or of the extent to which the body of the valve unit is recessed into the wall.

Preferably, the invention provides an assembly of parts in which the valve stem is non-shiftable, and the outer end of the stem is centered relative to the tubular extension or tubular guide through the intermediary of the handle.

Features of the invention are found in the slidably adjustable self retaining mounting of the wall shield member, and also in the cooperative centering relationship between the valve stem and the surrounding tubular extension.

Other features and advantages will hereinafter appear.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of two

specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a longitudinal sectional view featuring the tubular guide member in a wall valve unit embodying the improvements, and illustrating one form of mounting the operating handle; and

FIG. 2 is a fragmentary view illustrating another form of handle mounting.

One embodiment of the valve unit illustrative and exemplary of this invention comprises a valve housing 1 which may be of conventional construction having a valve seat 2 providing the valve through flow opening, and having internally threaded inlet and outlet end portions I and A which may be coaxially arranged for connection to inlet and outlet pipes P_1 and P_2 respectively. The valve housing also has a lateral neck portion which may be internally threaded and preferably directed at right angles to the axis of the inlet and outlet portions.

In this example, a nipple element 3 is tightly screwed into the neck portion N of the housing. This nipple element constitutes a removable valve top member in which a valve stem S is mounted for rotation. The inner end portion 4 of the stem carries a valve member 5. The outer or projecting end portion 12 of the stem carries a handle which may be one designated as 10 of the type shown in FIG. 1 or the one designated as 11 and shown in detail FIG. 2, both further to be described below.

The mounting of the stem and valve member is such that rotation of the stem will move the valve member axially relative to the nipple element while closing or opening the valve member relative to the valve seat. Preferably, however, the stem while rotatable in the nipple element is secured against axial displacement, while the outer end portion of the valve member has threaded engagement with the inner end portion of the stem and will move axially thereon to or from the valve seat when the stem is being rotated, with the outer end portion E_3 of the valve member longitudinally guided by some suitable means for example for axial movement within the inner end portion of the nipple element.

The nipple element 3 has inner and outer end portions E_1 and E_2 respectively both provided with external thread and divided by an intermediate flange portion K presenting opposed abutment shoulders S_1 and S_2.

The outer end of the nipple element is formed with an internal flange 20 defining a bore B in which fits the valve stem S mounted for rotation. In the preferred embodiment, this stem is secured against axial displacement in the nipple element by means of an inner collar 19 and an outer collar in the form of a snap ring 21 removably self-retained in a peripheral groove 22 on the stem, and the internal flange 20 of the nipple element confined between the two collars 19 and 21. In this embodiment the stem is furthermore formed with a third collar C spaced inwardly from the inner collar 19, with sealing means such as a rubber ring 23 confined between collars 19 and C and sealingly engaging the inner cylindrical wall of the nipple element.

It will be seen that the inner end portion of the nipple element is screwed tightly into the neck portion N of the valve housing with a gasket ring G confined between flange K and the end face of the neck. Furthermore, according to the invention, a tubular guide member or guide 7 has its inner end portion screwed onto the external thread of the outer end portion of the nipple element tightly against the flange K thereof, so that in this way the tubular guide is rigid with the nipple element and concentrically surrounds the outer end portion 12 of the stem.

The tubular guide has a smooth outer cylindrical surface 8 surrounded by a wall shield member 9 axially slid-

able and axially adjustable on the guide. Preferably, the shield member is in the form of a shallow bell shiftable on the guide into engagement with the surface W of a wall into which the valve may be received a distance H.

In the present embodiment a groove 17 is formed along the inner edge of the wall shield member to accommodate a ring 18 of rubber or the like which may frictionally engage the periphery of guide 7 thereby enabling the shield member to retain itself axially adjusted aganst the wall. Access to all the parts is readily had by unscrewing the nipple 3 from the housing, with all the parts carried thereby or after first removing the handle and the shield.

With this invention, it will be seen that not only is the valve construction simplified as compared with prior wall valve units, but it is also rendered relatively independent of the extent H to which the valve may be recessed into the wall, while the wall shield itself is readily and simply adjustable to any chosen distance H as above set forth. Accordingly, the outer end portion 12 of the stem and the surrounding tubular guide 7 may be made of such length as to accommodate a desired range of distances H in the wall recessing of the valve unit.

According to the invention, the handle which is removably affixed to the extreme outer end portion of the stem, has cooperative engagement with the tubular guide by being centered on the outer end thereof. In this way, even with a relatively long protruding stem, the exposed length thereof is guided and stabilized on and by the surrounding tube, thereby insuring the proper axial position and adjustment of the stem.

In the embodiment of FIG. 1 the handle 10 is mushroom-shaped and force-fitted onto a longitudinally riffled or fluted terminal portion 13 of the stem. The hub of this handle is formed with an eccentric portion 15 and an adjoining groove 14, whereby the handle engages an inward terminal flange T of the tubular guide and whereby the handle is axially secured and the stem is stabilized concentrically with the surrounding tube.

In the embodiment of FIG. 2, the handle 11 is of even more pronounced mushroom shape and instead of being press fitted is mounted on the stem by means of screw connection M in the manner shown in FIG. 2. This handle is formed with an internal cylindrical face 16 surrounding the slightly recessed cylindrical end face Q of the tubular guide whereby the two cylindrical faces 16 and Q are centered with respect to one another, thereby providing the aforementioned stabilization for the stem relative to the surrounding tube.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of valve units differing from the types described above. It is also possible to employ the wall valve shown to obtain a wall mixer consisting of two valves for mixing cold and warm water.

While the invention has been illustrated and described as embodied in a wall valve unit, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalences of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a valve arrangement, in combination, a valve top member having an outer end and an inner end; a valve stem rotatably mounted in said top member and having an inner end portion and an outer end portion, said outer end portion extending a substantial distance beyond the outer end of said top member; a valve member carried by said inner end portion of the stem and movable axially relative to said top member in response to rotation of said stem; a tubular guide of constant cross-section surrounding said outer end portion of the stem and rigid with said top member; a handle connected to the outer end portion of said stem and rotatably centered on the outer end of said guide, said guide engagin and holding said handle against axial movement with respect thereto; a shield member axially slidably surrounding said tubular guide; and a ring of resiliently yieldable material mounted in said shield member and frictionally engaging the periphery of said tubular guide.

2. In a valve arrangement, in combination, a nipple element having an outer end portion and an inner end portion, said end portions divided by a flange portion and both provided with external threads; a valve stem rotatably mounted in said nipple element and having an inner end portion and an outer end portion, said last mentioned end portion extending a substantial distance beyond the outer end portion of said nipple element; a valve member carried by the inner end portion of said stem and movable axially relative to said nipple element in response to rotation of said stem; a tubular guide of constant cross-section surrounding the outer end portion of said stem and tightly screwed onto the outer end portion and into abutment with the flange portion of said nipple element; a handle connected to the outer end portion of said stem and rotatably centered on the outer end of said guide said guide engaging and holding said handle against axial movement with respect thereto; and a shield member surrounding and axially adjustable along said tubular guide.

3. In a valve arrangement, in combination, a nipple element having an outer end portion and an inner end portion, said end portions divided by a flange portion and both provided with external threads; a valve stem rotatably mounted in said nipple element and having an inner end portion and an outer end portion, said last mentioned end portion extending a substantial distance beyond the outer end portion of said nipple element; a valve member carried by the inner end portion of said stem and axially movable toward and away from said nipple element in response to rotation of said stem; a tubular guide of constant cross-section surrounding said outer end portion of the stem and tightly screwed onto the outer end portion and into abutment with the flange portion of said nipple element, said guide having an outer end portion adjacent to the outer end portion of said stem; a shield member surrounding and axially movable along said tubular guide; and a handle carried by the outer end portion of said stem for rotating the same and centered on the outer end portion of said guide, said guide holding said handle against axial movement with respect thereto.

4. In a valve arrangement, in combination, a nipple element having an outer end and an inner end, said outer end provided with an inturned flange; a valve stem having an inner end portion rotatably mounted in said nipple element and an outer end portion extending a substantial distance beyond the outer end of said nipple element; an inner collar and a detachable outer collar provided on said stem, said flange located between said collars to prevent any substantial axial shifting of the stem relative to said nipple element; a third collar provided on said stem and spaced inwardly from said inner collar; a sealing ring confined between said inner collar and said third collar; a valve member having an outer end portion axially movably guided in the inner end of said nipple element and secured against rotation with respect to said nipple element, said last mentioned outer end portion in threaded operating engagement with the inner end por-

tion of said stem whereby the valve member is moved axially relative to said nipple element when the stem is rotated relative to said nipple element, the asembly of said stem and said valve member being removable axially inwardly from said nipple element subsequent to detachment of said outer collar from said stem; a tubular guide of constant cross-section surrounding the outer end portion of said stem and rigid with said nipple element; a handle fixed to the outer end portion of said stem and centered on said guide; and a shield member surrounding and axially movable along said guide.

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