April 26, 1932. E. KENNEDY 1,855,354

PLUMBING FIXTURE

Filed July 19, 1928 3 Sheets-Sheet 1

Fig. 1

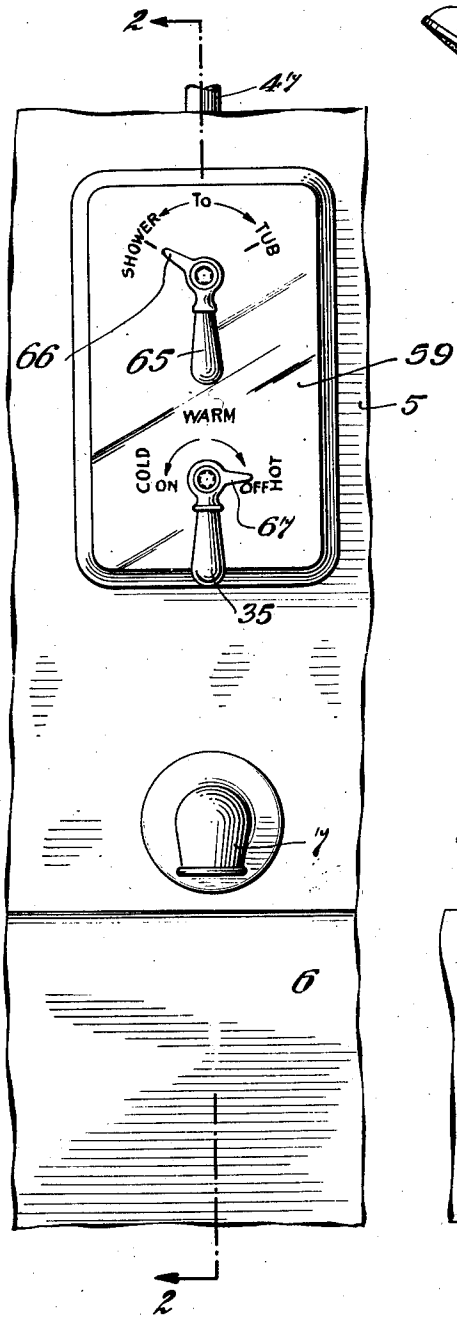
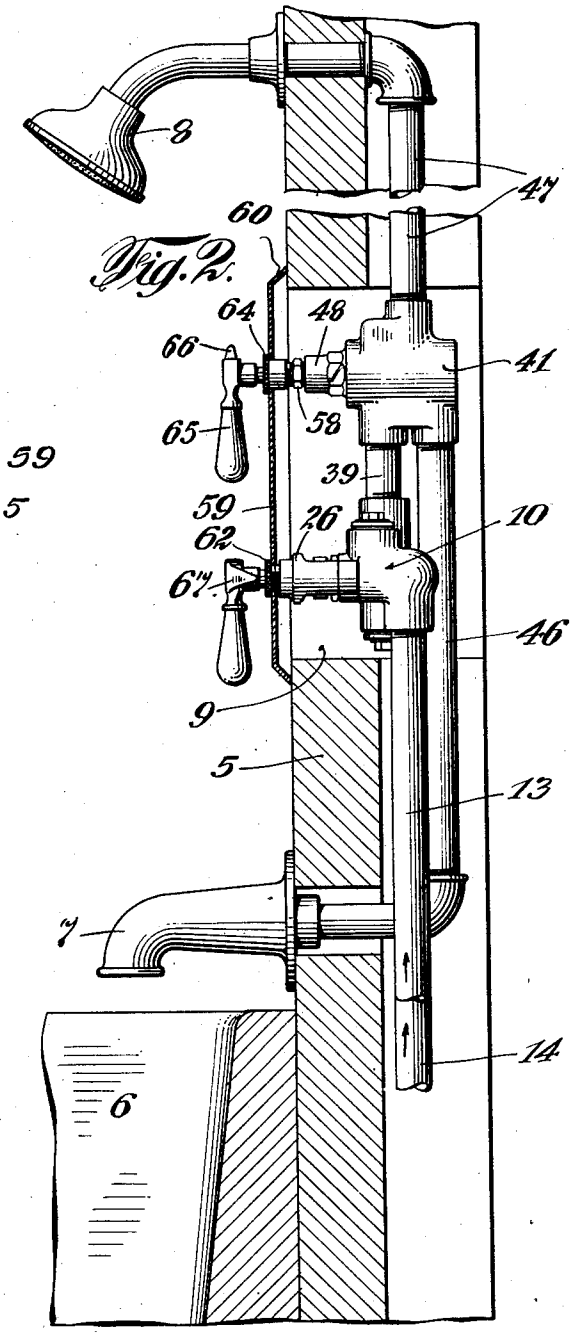


Fig. 2.



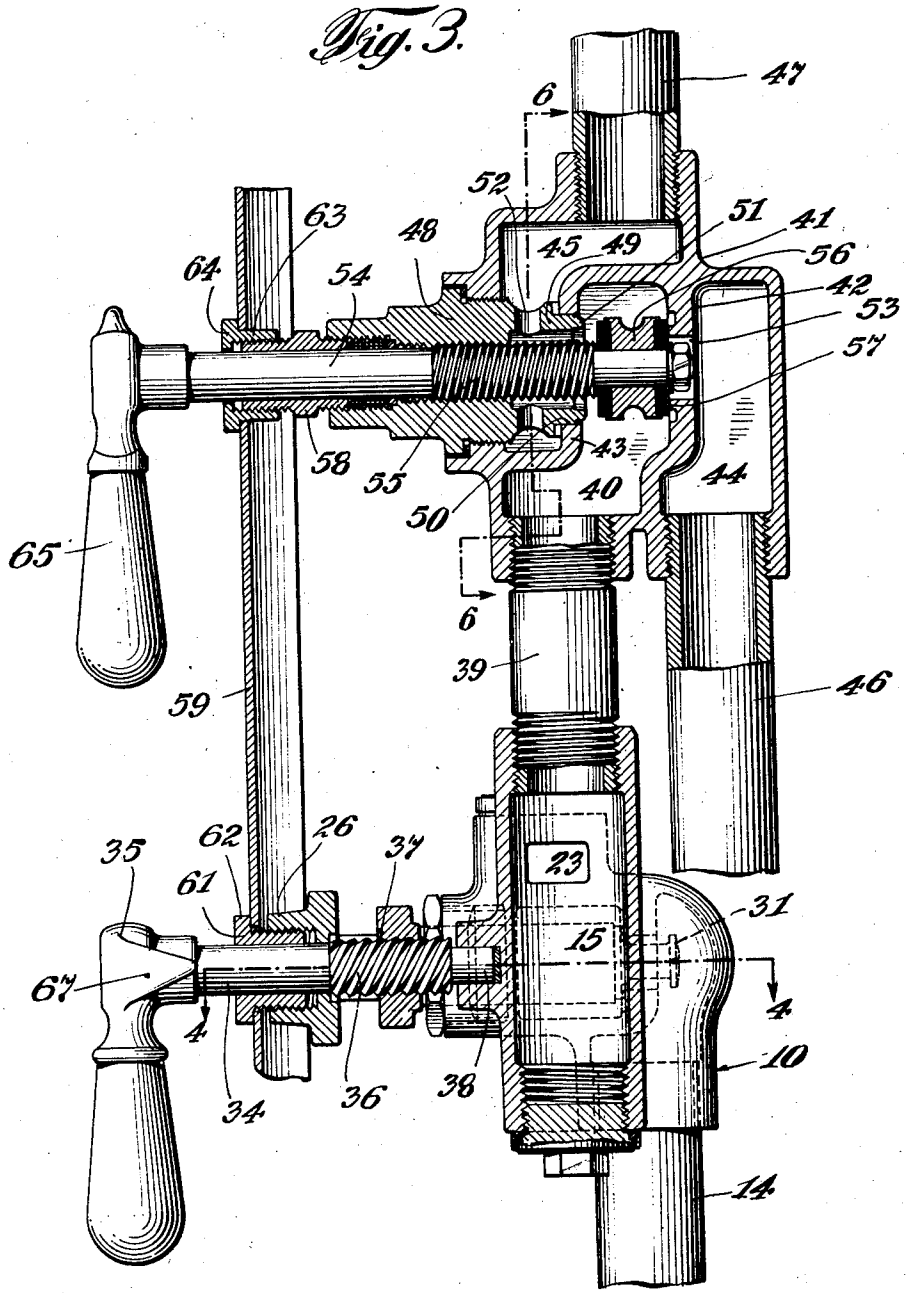
INVENTOR
Edward Kennedy
BY C. P. Goepel
his ATTORNEY

April 26, 1932. E. KENNEDY 1,855,354

PLUMBING FIXTURE

Filed July 19, 1928 3 Sheets-Sheet 2

Fig. 3.



INVENTOR
Edward Kennedy
BY C. P. Goepel
his ATTORNEY

April 26, 1932. E. KENNEDY 1,855,354

PLUMBING FIXTURE

Filed July 19, 1928 3 Sheets-Sheet 3

Fig. 4.

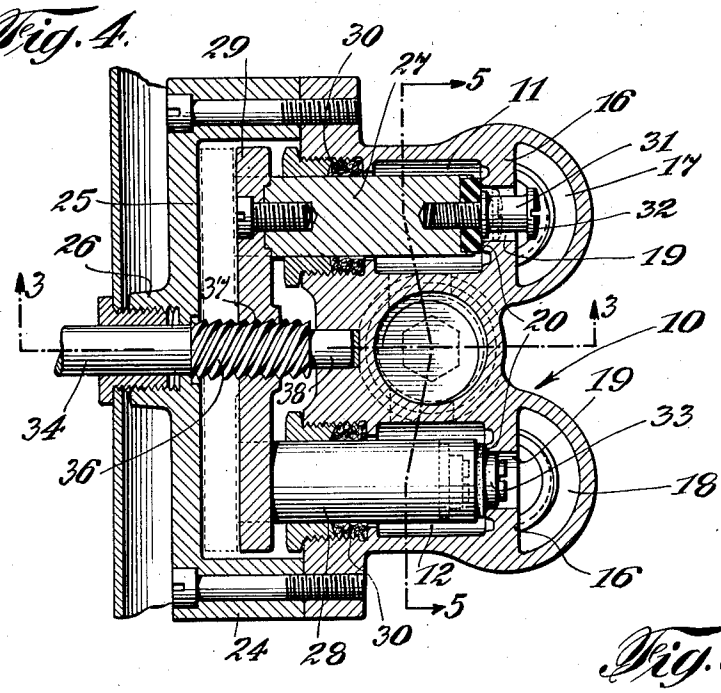


Fig. 5.

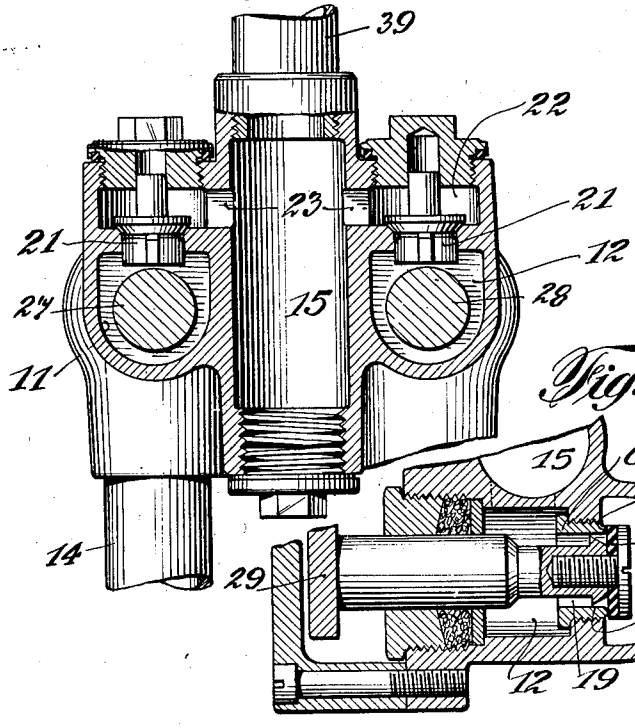


Fig. 6.

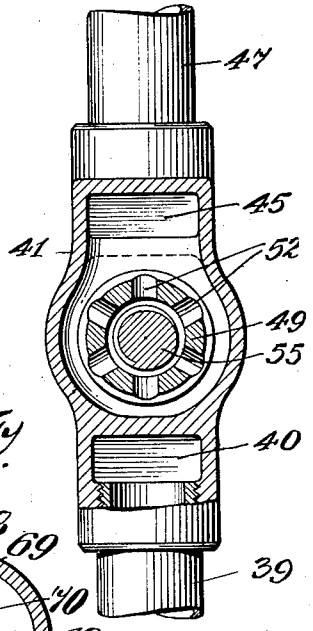


Fig. 7.

INVENTOR
Edward Kennedy
BY
C. P. Siepel
his ATTORNEY

Patented Apr. 26, 1932

1,855,354

UNITED STATES PATENT OFFICE

EDWARD KENNEDY, OF NEW YORK, N. Y.

PLUMBING FIXTURE

Application filed July 19, 1928. Serial No. 294,018.

This invention relates to plumbing fixtures, and more particularly to an improved bath and shower fitting or fixture, the primary object and purpose of the invention being to provide means whereby water at the desired temperature may be supplied either to a bath tub or to a shower or spray with the manipulation of a minimum number of valve handles.

It is also another object of the invention to provide a convenient arrangement of the valve operating handles with a common escutcheon plate covering the opening or recess in the wall in which the valve mechanism is arranged and a simple and effective means for rigidly securing said escutcheon plate in position.

It is also an important object of the invention to provide an improved construction and mounting of the mixing valves for hot and cold water with a single operating handle therefor whereby the hot and cold water may be supplied in regulated volume to the mixing chamber with a minimum extent of movement of the handle member.

It is also a further object of the invention to provide a simple and compact arrangement of the valve means for controlling the flow of water from the mixing chamber to the tub or the shower so that both of said valve means, together with the necessary connections may be arranged in the building wall for easy accessibility.

It is also a further general object of the invention to provide a plumbing fixture of the above character which will be simple in its construction, reliable and positive in its practical operation, and capable of manufacture at comparatively small cost.

With the above and other objects in view, the invention consists in the improved plumbing fixture and in the form, construction and relative arrangement of the various parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have illustrated one simple and practical embodiment of the invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Fig. 1 is a front elevation showing the arrangement of the valve operating handle and the common escutcheon plate therefor;

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical section taken on the line 3—3 of Fig. 4;

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4;

Fig. 6 is a vertical sectional view taken on the line 6—6 of Fig. 3, and

Fig. 7 is a fragmentary view similar to Fig. 4 showing an alternative form of the mixing valve mechanism.

Referring in detail to the drawings, 5 indicates the vertical building wall at one end or side of the tub shown at 6, above which there is arranged the hot and cold water supply nozzle 7, and at a suitable elevation and in any desired relation to the tub the spray or shower nozzle 8 is arranged.

The wall 5 above the tub supply nozzle 7 has an opening or recess 9 formed therein to receive the valve mechanism. This mechanism includes a mixing valve casing generally indicated at 10 having horizontally spaced chambers 11 and 12 receiving hot and cold water respectively through the pipe connections 14 and 13. Between these chambers 11 and 12 there is provided a mixing chamber 15. At the rear side of each chamber 11 and 12 there is provided a vertically extending web or wall 16 separating said chamber from the water entrance chambers 17 and 18 respectively. These chambers are connected with the chambers 11 and 12 by the openings 19 formed through the walls 16, said walls being suitably formed at the front end of each opening 19 with a valve seat indicated at 20.

The top wall of each of the chambers 11 and 12 is also provided with an opening in which a gravity seated check valve 21 is positioned and normally closes communication between the chamber 12 and an upper chamber 22 which is in communication with the

mixing chamber 15 through the openings or passages 23.

Upon the front side of the mixing valve casing 10 a casting 24 is rigidly secured at its opposite ends, said casting having a horizontally extending portion 25 spaced from the valve casing and centrally provided with an internally threaded boss 26, the purpose of which will presently appear. Spaced cylindrical valve stems 27 and 28 respectively, are suitably secured on the opposite ends of a plate 29 and are movable through the stuffing boxes 30. The valve stem 27 extending into the hot water receiving chamber 11 is provided with a detachable valve head 31 projecting through the opening 19 and having spaced annular parts 32 of but slightly less diameter than the diameter of said opening and a connecting portion between said spaced parts of smaller diameter.

The other valve stem 28 extending into the cold water receiving chamber 12 is also provided with a vale head 33 which is relatiely short, and is of but little less diameter than the diameter of the opening 19.

These hot and cold water controlling valves are operated by means of the rod or shaft 34 having a handle 35 fixed to its outer end and rotatably journalled or supported in the casting 24. The inner end portion of this rod is provided with a course or quick thread 36 engaged in the central threaded opening 37 of the plate 29, the extreme inner end of said rod having a bearing as at 38 in the wall of the valve casing 10.

The mixing chamber 15 is connected at its upper end by means of a suitable nipple 39 with the inlet chamber 40 of the casing 41 and a two-way valve. This valve casing is provided with spaced internal walls or webs 42 and 43 respectively, separating the inlet chamber 40 from the two outlet chambers 44 and 45 respectively. The chamber 44 is connected by the downwardly extending pipe 46 with the supply nozzle 7 of the bath tub, while the other outlet chamber 45 is connected by the upwardly extending pipe 47 with the spray or shower nozzle 8. In the front wall of the chamber 45 a member 48 is detachably threaded and has an inner reduced end portion 49 snugly fitting in the opening 50 provided in the casing wall 43, said end portion 49 terminating in a suitably formed valve seat 51. Between the front casing wall and the wall 43, the member 48 is provided with a plurality of radially extending openings indicated at 52 which afford communication between the chambers 40 and 45. Similar communication is also obtained between the chamber 40 and the chamber 44 through an opening 53 which is provided in the casing wall 42.

The member 48 has an internally threaded bore receiving the threaded section 55 of a valve rod or shaft 54. The inner end of this rod is provided with a suitable valve member 56 adapted in one position to engage against the seat 57 surrounding one side of the opening 53, and in another position engaging upon the valve seat 51.

In the outer end of the member 48 a nipple 58 is threaded at one of its ends.

A single escutcheon plate 59 extends over the opening 9 and has a marginal flange 60 bearing on the face of the building wall in spaced relation to each edge of said opening. This escutcheon plate at properly spaced points, is provided with openings therein to accommodate the valve operating shafts or rods 34 and 54. An externally threaded sleeve or collar 61 extends through one of said openings for adjustable connection with the internally threaded boss 26 on the casting 24 and is provided on one end with the flange 62 bearing against the outer face of the escutcheon plate 59. The periphery of this flange is milled or knurled, or if desired, said flange may be of polygonal external form for application of a suitable wrench thereto.

An internally threaded sleeve 63 is disposed through the other opening in the escutcheon plate and engaged with the external threads on the end of the nipple 58, said sleeve also being provided on its outer end with the flange 64 bearing against the face of the escutcheon plate. It will thus be seen that by the proper adjustment of these two sleeves 61 and 63, the marginal flange 60 on the escutcheon plate 59, may be held in tight clamping engagement against the face of the building wall.

The outer end of the valve rod or shaft 54 is provided with a suitable operating handle 65, and said handle is formed with a radially projecting indicator finger 66. A similar finger 67 is also provided on the operating handle 35 for the mixing valve. The indicating finger 66 is adapted to be positioned with respect to the words "Shower" and "Tub" suitably delineated on the upper portion of the escutcheon plate in connection with arrows indicating the direction of movement of the handle.

The lower portion of the escutcheon plate 59 also contains the designations "Hot", "Warm" and "Cold" with respect to which the finger 67 of the valve handle 35 is adapted to be positioned. The words "On" and "Off" are also provided on the escutcheon plate indicating the fully closed and open positions of the mixing valve members.

From the above description, the operation of the device will be clearly understood. Thus, assuming that the mixing valve handle 35 is in the position as shown in Fig. 1 of the drawings, in the first movement thereof, by reason of the threaded connection 36 of the rod 34 with the plate 29, the two valve stems 27 and 28 are moved outwardly. However, as the valve member 33 almost completely

closes the port 19 leading to the cold water chamber 12, very little cold water will enter said chamber. On the other hand, since the valve member 31 has its intermediate portion reduced in diameter and in the first movement of this valve member, the enlarged parts thereof will be spaced from the opposite ends of the opening 19 leading to the chamber 11, hot water in practically maximum volume will enter said chamber. Further, movement of the handle 35 to position its indicating finger 67 opposite the designation "Warm", the rear enlarged end of the valve member 31 enters the opening 19, thereby restricting or cutting down the flow of hot water through said opening so that approximately the same volume of hot water may enter the chamber 11 as the volume of cold water which may pass around the valve member 33 and into the chamber 12. The streams of hot and cold water are thoroughly mixed in the central chamber 15 and pass therefrom upwardly into the chamber 40, from which the water flows either upwardly through ports 52 and chamber 45 and pipe 47 to the spray or shower nozzle, as shown in the drawings, or through opening 53 and chamber 44 downwardly through pipe 46 to the tub nozzle 7, when the handle 65 is operated to uncover the opening 53 and engage valve 56 on the seat 51.

A further movement of the handle 35 to position its finger 67 opposite the words "On" and "Cold", causes the entire displacement of the valve part 33 from opening 19 beyond the front end of said opening so that cold water in maximum volume may then enter the chamber 12. The enlarged end of valve 31 however being still positioned within the opening 19 leading to the chamber 11 prevents any appreciable volume of hot water entering said chamber. Thus it will be seen that water of the desired temperature to suit the personal preference of the individual may be readily obtained. Upon returning the valve handle 35 to the off position, both the hot and cold water control valves are tightly closed on the seats 20, thereby completely cutting off the further flow of water.

It will be understood of course, that the gravity seated check valves 21 are moved upwardly to open position by the water pressure, but effectually prevent back pressure in the chamber 15 entering the chambers 11 and 12.

In Fig. 7 of the drawings, I have shown a slightly different form of the mixing valves, in which the valve members are moved in the reverse direction from that indicated in Fig. 4 of the drawings to admit the hot and cold water to the chambers 11 and 12. In this case, I preferably provide valve seat members 68 threaded into each of the openings 19 and provided at its rear end opposed to the chambers 17 and 18 with the suitably formed valve seats 69 against which a compressible valve disc 70 mounted on the end of the reciprocating valve stem is adapted to engage.

The end of the valve stem is of greatly reduced diameter and extends through the valve seat member 68, the said reduced section of the valve stem being provided with an annular flange or rib 71 having a longitudinally inclined or sloping surface gradually increasing in diameter from the valve disc 70 to the forward end of said flange, the latter end of which is but slightly less in diameter than the internal diameter of the member 68. In Fig. 7, I have shown the cold water control valve, and for the hot water valve, this sloping or inclined flange on the valve stem will be differently located, and in the closed positions of the valves would be somewhat in advance or forwardly of the valve seat member 68. Thus in this case, when the handle 65 is operated, the two valves are moved rearwardly through the valve seat members 68, and in the initial movement, hot water is supplied in full volume, the flow thereof being subsequently reduced, and then finally substantially entirely cut off, at which time the flange 71 of the cold water valve member is positioned entirely beyond the rear end of the valve seat member 68 so that cold water in full volume is then supplied to the mixing chamber, exactly as described in connection with the embodiment of the invention shown in Fig. 4 of the drawings.

From the foregoing description considered in connection with the accompanying drawings, the construction and manner of operation of the several illustrated embodiments of my invention will be clearly understood. It will be seen that I have provided a combination bath and shower fixture embodying a relatively small number of parts of simple form and construction which may be compactly associated and readily mounted and arranged in a minimum space in the building wall. The mixing valves can be easily adjusted by the movement of the single operating handle so as to regulate the temperature of the water as may be desired and by the proper adjustment of the single control valve, the water may be delivered from the mixing chamber either into the bathtub or to the spray or shower nozzle. By providing the detachable valve members 31 and 33, other valve members of different sizes or forms may be associated with the movable valve stems 27 and 28 so as to change the relative volumetric proportions of the hot and cold water entering the mixing chamber in the different adjusted positions of said valve members.

In the event that inspection and repair of any parts of the fixture becomes necessary access may be readily had to the wall cavity by simply unthreading the escutcheon clamp-

ing sleeve 61 and 64 which will permit detachment of the part 48 from the valve casing 41 and of the casting 24 from the casing 10, so that the entire assembly of the several valves together with the escutcheon plate may be readily removed. The outer surface of the escutcheon plate 59 may be nickeled, enameled or otherwise provided with a suitable ornamental finish, and together with the two valve operating handles, lends an attractive appearance to the wall surface.

It will however, be understood that the escutcheon plate 59 may be produced in various other outline shapes or forms than that which I have selected for purposes of illustration and that the indicative words provided on the face thereof may also be otherwise arranged than as shown. Further, while I have herein shown and described a simple and practical construction and arrangement of the various mechanical elements constituting my improved bath and shower fitting, it will nevertheless be understood that the same are susceptible of more or less modification, and I therefore, reserve the privilege of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:

1. In a mixing valve, a valve casing having spaced water inlet chambers, a mixing chamber and passages connecting the inlet chambers with the mixing chamber, hot and cold water supply pipe connections for said inlet chambers, one wall of each of said chambers having an inlet opening for the water, reciprocating valve stems mounted in said casing and adapted for engagement upon seats at one end of the respective openings, a valve head carried by each stem extending into said opening and controlling the flow of water therethrough, a common means for simultaneously and equally reciprocating said valve stems and said valve heads being of relatively different forms so that upon the initial movement of the valve stems from a closed position, hot water is supplied in maximum volume to one of said inlet chambers, the said supply of hot water being reduced in volume upon further adjustment of the valves, and such reduced supply of hot water maintained in the final adjustment of the valves to open position, thereupon cold water in maximum volume is admitted to the other of the inlet chambers, and pressure operated check valves normally closing communication between said water inlet chambers and the mixing chamber.

2. In a mixing valve, a valve casing having spaced water inlet chambers, a mixing chamber and passages connecting the inlet chambers with the mixing chamber, one wall of each of said inlet chambers having an opening therethrough, valves mounted in said casing and cooperating with the respective openings to control the passage of water to the inlet chambers, means for actuating said valves, said valve casing having additional openings affording communicaton between said inlet chambers and said connecting passages, and gravity seated check valves normally closing said latter openings and movable to open position by water pressure in said inlet chambers.

In testimony that I claim the foregoing as my invention, I have signed my name hereto.

EDWARD KENNEDY.