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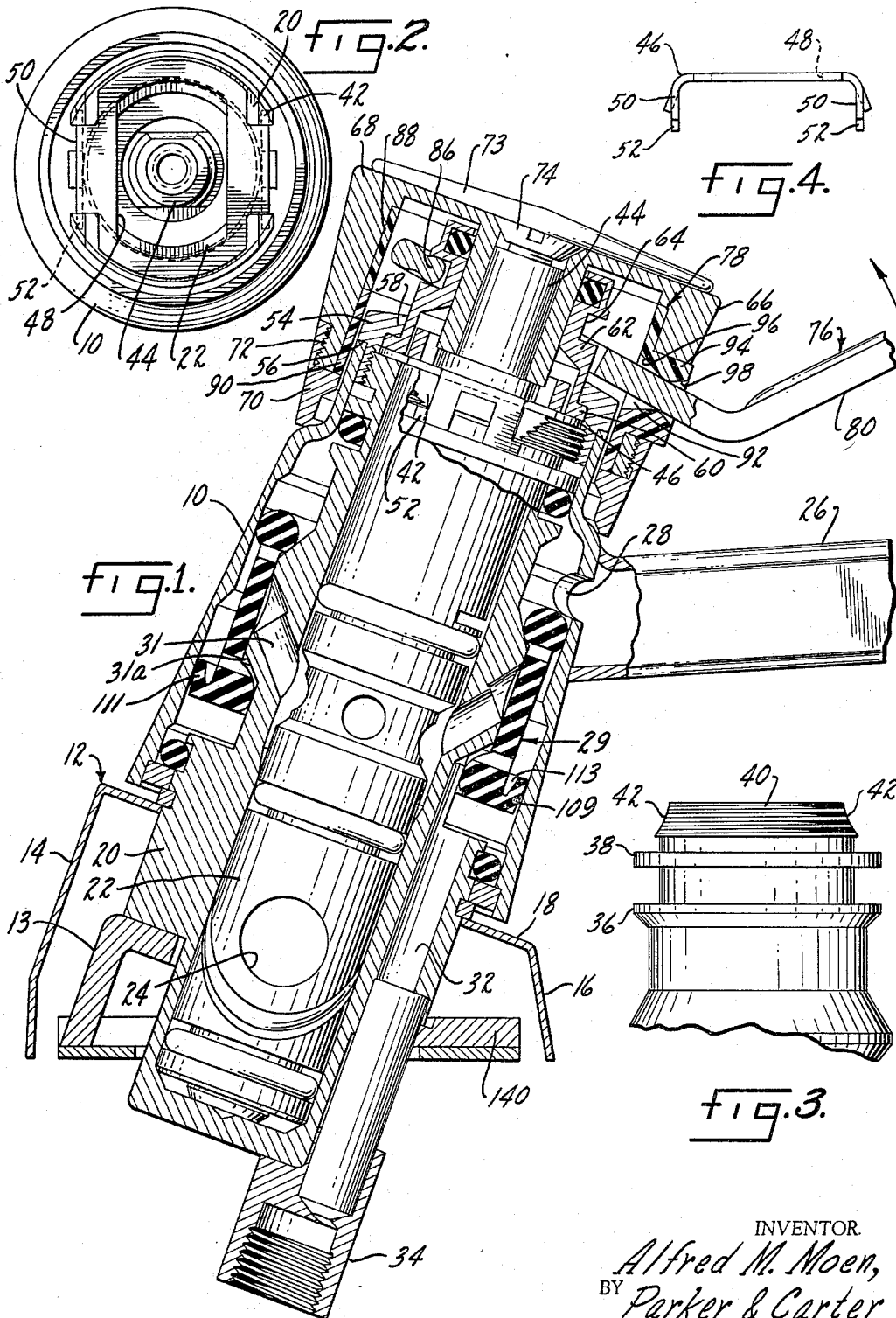
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3,287,985

CARTRIDGE SWING SPOUT FAUCET AND IMPROVEMENTS THEREON

Original Filed July 6, 1962

4 Sheets-Sheet 1



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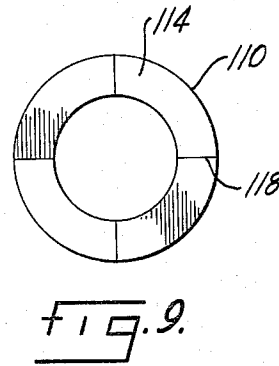
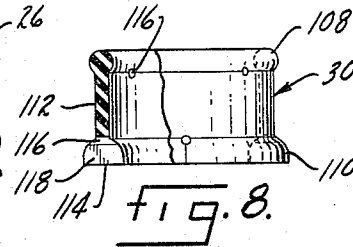
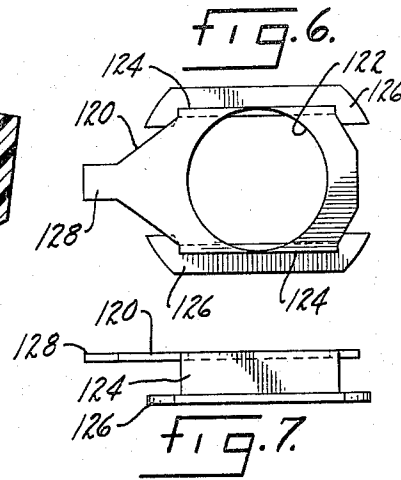
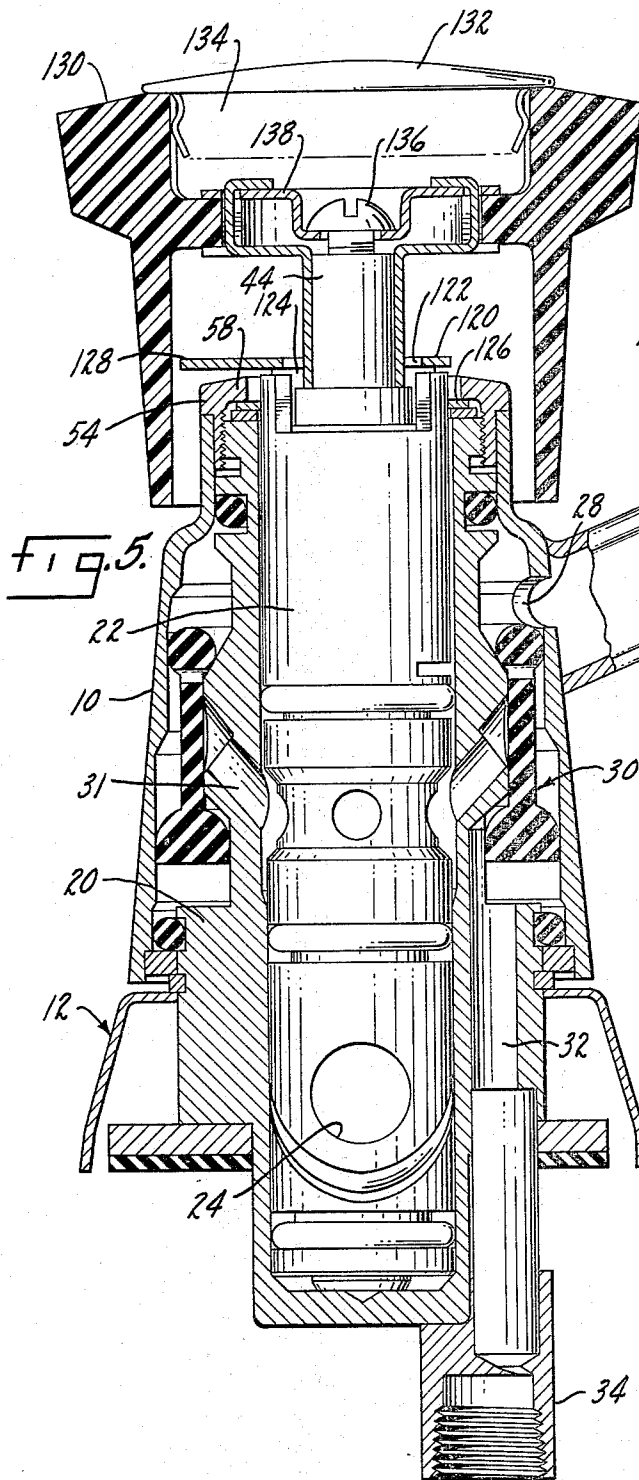
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4 Sheets-Sheet 2



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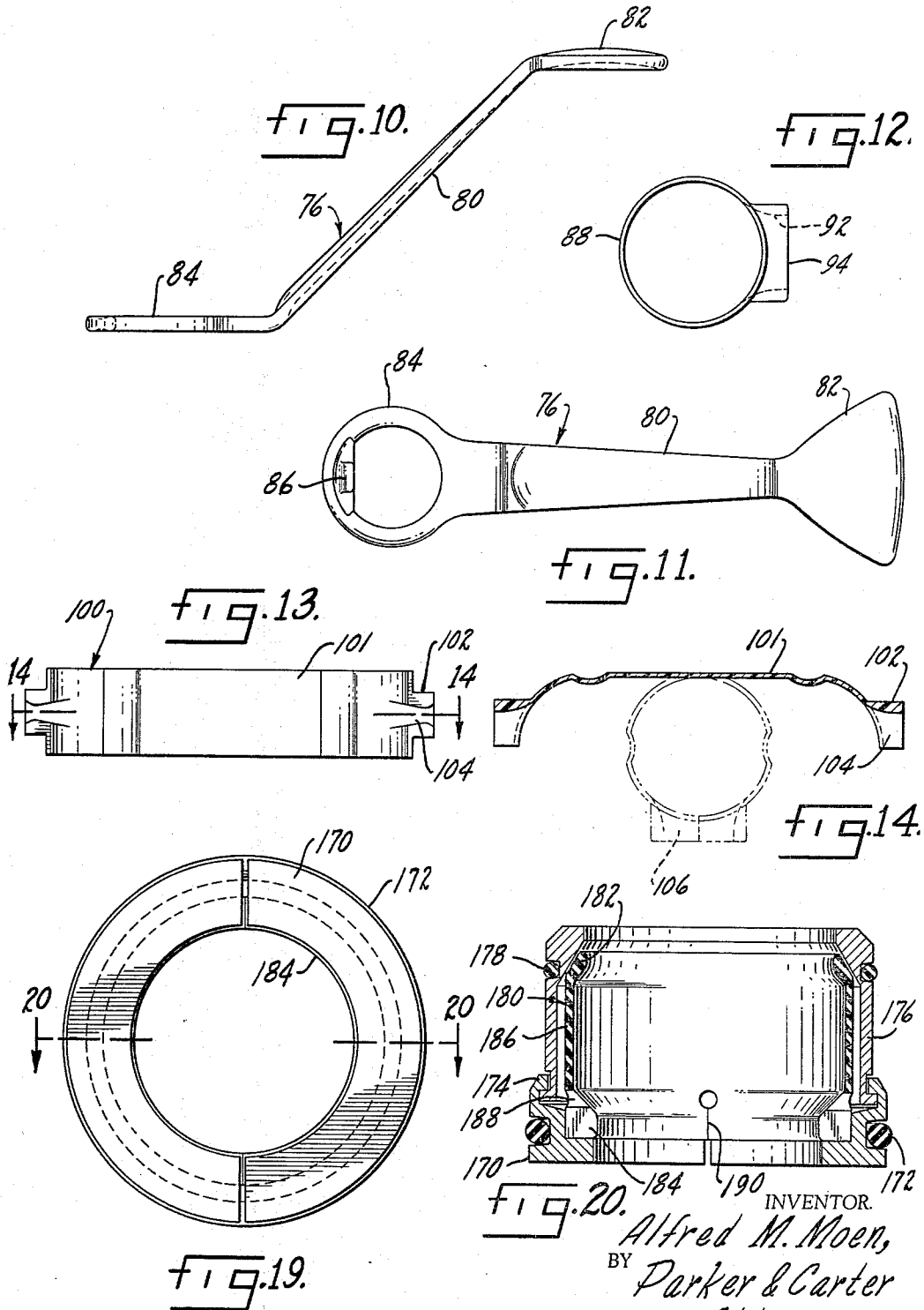
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4 Sheets-Sheet 3



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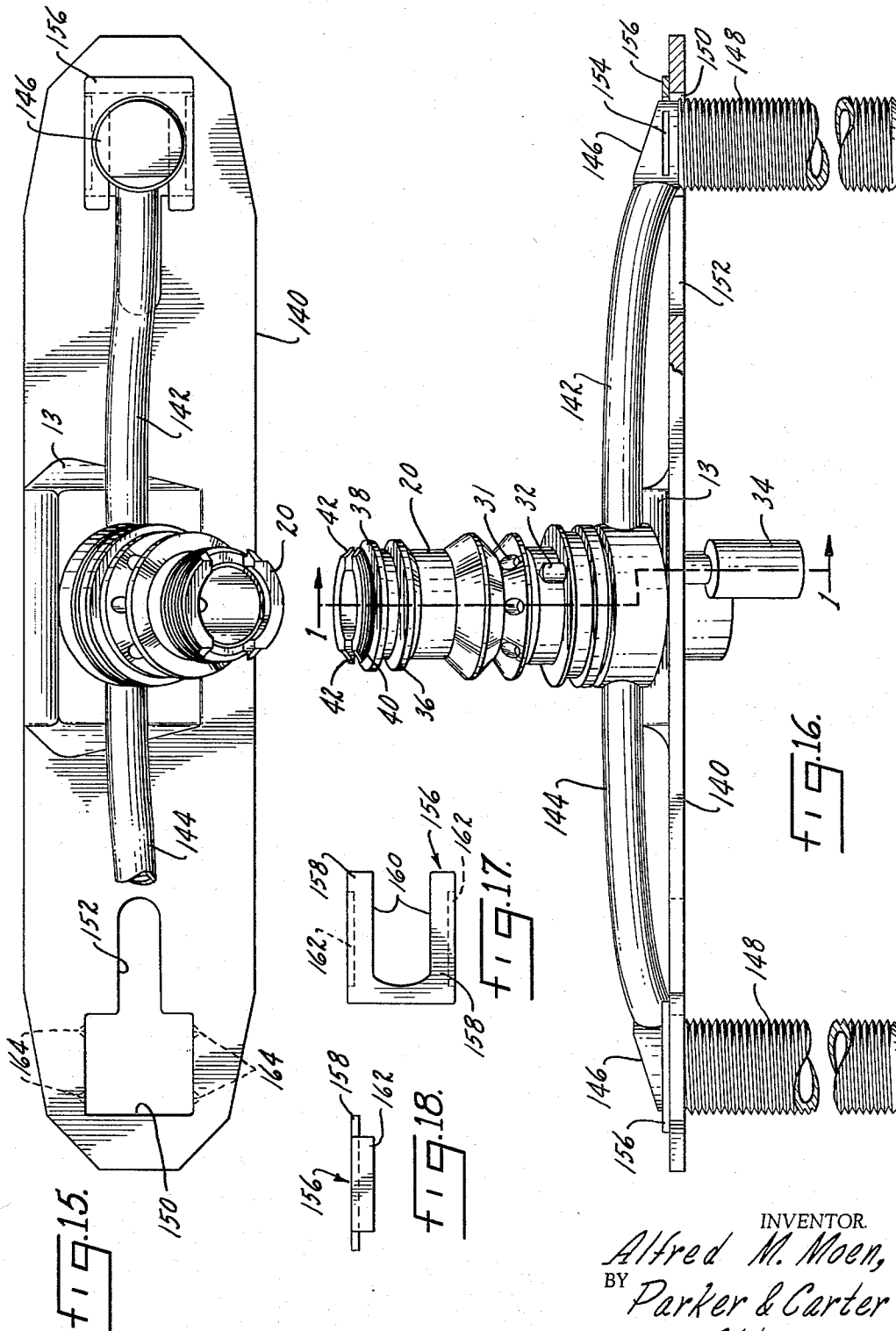
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CARTRIDGE SWING SPOUT FAUCET AND IMPROVEMENTS THEREON

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4 Sheets-Sheet 4



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## CARTRIDGE SWING SPOUT FAUCET AND IMPROVEMENTS THEREON

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Continuation of application Ser. No. 297,893, July 6, 1962. This application Nov. 5, 1964, Ser. No. 410,326  
12 Claims. (Cl. 74-104)

This invention relates to a lever cartridge swing spout faucet and improvements thereon and is a continuation of my copending application Serial No. 207,893, filed July 6, 1962, now abandoned.

A primary purpose of the invention is a faucet assembly of the type described which may interchangeably use a pivot knob or a handle for operating the valve.

Another purpose is a faucet assembly of the type described in which the valve housing is inclined to the vertical.

Another purpose is a faucet assembly having improved means for mounting a rotating and reciprocating handle.

Another purpose is a faucet assembly with an improved mounting arrangement for fastening the faucet to a sink or the like.

Other purposes will appear in the ensuing specification, drawings and claims.

The invention is illustrated diagrammatically in the following drawings wherein:

FIGURE 1 is an axial view through a faucet housing, with parts in section, taken along plane 1-1 of FIGURE 16,

FIGURE 2 is a view along plane 2-2 of FIGURE 1, with the upper portion of the housing removed,

FIGURE 3 is a view of the top of the valve body,

FIGURE 4 is a side view of the snap ring used to hold the valve cartridge within the valve body,

FIGURE 5 is an axial view, similar to FIGURE 1, illustrating a pivot cap for operating the valve cartridge,

FIGURE 6 is a top plan view of a stop member used in the assembly of FIGURE 5,

FIGURE 7 is a side view of the stop member shown in FIGURE 6,

FIGURE 8 is a side view, in part section, of a diverter member used in the assembly of FIGURES 1 and 5,

FIGURE 9 is a bottom view of the diverter illustrated in FIGURE 8,

FIGURE 10 is a side view of the handle used in FIGURE 1-4,

FIGURE 11 is a top plan view of the handle of FIGURE 10,

FIGURE 12 is a top plan view of a mounting sleeve for use in mounting the handle within the faucet assembly,

FIGURE 13 is a side view of a modified form of mounting sleeve,

FIGURE 14 is a top plan view of the mounting sleeve shown in FIGURE 13, taken along plane 14-14 of FIGURE 13, with the assembled position illustrated in broken lines,

FIGURE 15 is a top plan view of a faucet assembly showing means for mounting it to a sink board or the like,

FIGURE 16 is a side view of the mounting arrangement illustrated in FIGURE 15,

FIGURE 17 is a top plan view of a mounting member for use in the arrangement of FIGURES 15 and 16,

FIGURE 18 is a side view of the mounting member shown in FIGURE 17,

FIGURE 19 is a bottom view of a modified form of diverter, and

FIGURE 20 is a section along plane 20-20 of FIGURE 19.

In FIGURE 1, a generally cylindrical slightly conical housing 10 may be mounted in an inclined position

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by a lower generally cup-shaped mounting member 12. The rear side of the member 12, indicated at 14, is higher than the front side, indicated at 16, with the top 18 being inclined. The housing 10 and the cup-shaped mounting member 12 together define a housing for a valve body 20. A conical mounting member 13, positioned within member 12 may hold the bottom of the valve body 12 in position.

Mounted within the valve body 20 is a valve cartridge 22 having inlet ports 24 for hot and cold water, only one of said ports being shown. The valve cartridge 22 will not be explained in detail herein, as valve cartridges of this general type are illustrated in my Patent No. 3,103,231, filed February 3, 1960, and issued September 10, 1963. What is important is that a valve means be positioned within the valve body which is effective to mix hot and cold water in the amounts desired and then to regulate the volume of the discharge of water upon rotation and reciprocation of a valve stem.

A spout 26 fastened to the housing 10 may be in communication with the interior of the housing through a port 28. Mounted for up-and-down movement between the valve body 20 and the housing 10 is a diverter indicated generally at 29. The operation of the diverter is generally the same as that illustrated in my co-pending application Serial No. 117,117, filed June 14, 1961, now abandoned. In the position shown, water from the valve body discharges through ports 31, and then through passage 32 to an auxiliary device, such as a spray. The upper portion of the diverter seals the outlet to the spout. In normal operation, the diverter will raise up until the lower ring contacts the tapered portion 31a of the valve body and seals the entrance to passage 32. Water will then be directed to spout 26.

The upper end of the valve body, illustrated in FIGURE 3, may have an outwardly extending annular flange 36 which is spaced from a higher outwardly extending annular flange 38. The portion of the valve body above the flange 38 may be threaded, as at 40, and may have opposite side portions which are recessed or formed on an inwardly extending concave curve 42. The valve cartridge 22 may have a reciprocal and rotatable valve stem 44 which extends outwardly from the end of the cartridge. A mounting member or snap ring 46, illustrated in FIGURE 4, may have a central aperture 48 which the valve stem 44 passes and may have downwardly extending flanges 50, on opposite sides. The snap ring 46 fits over the end of the valve cartridge and, when pressed into position, the flanges 50 are bent down along the curved portion 42 to hold the ring to the top of the valve body. The flanges 50 may have outwardly extending ears 52, shown in FIGURE 1, which fit under the threaded area 40.

A collar 54 may be screwed onto the threads 40 and may have an outwardly extending flange 56 which lays on top of the housing 10 when the collar is fully turned down. The collar 54 may have an inwardly extending annular flange 58 which overlies a lower flange 60 on a sleeve 62. The sleeve 62 is fastened to the housing and valve body by the collar 54 and has an annular groove 64 which mounts the faucet handle, said sleeve 62 functioning as a fulcrum for the handle.

A pivot cap 66, somewhat conical in shape, tapers backwardly toward the housing and is formed by an upper section 68 and a lower section 70, the upper and lower sections being threaded together, as at 72. On top of the cap 66 is a cover 73 which snaps into the top and masks a screw or the like 74 which mounts the pivot cap to the valve stem 44. Mounted within the cap 66 is a handle indicated generally at 76 and a sleeve for mounting the handle indicated generally at 78.

The handle 76 is illustrated in FIGURES 10 and 11 and includes an upwardly inclined relatively long and narrow body portion 80 with an outwardly tapered and enlarged gripping end 82. The handle may have a somewhat circular enlarged section 84 within the cap 66 and a locking section or portion 86 which fits within the annular groove 64 to hold the handle to the valve body.

The sleeve 78, as shown in FIGURES 1 and 12, may include a pair of symmetrical sections 88 and 90, with section 88 being the upper section and 90 being the lower. Each of these sections is circular, as illustrated in FIGURE 12, and has an opening 92 defined by an outwardly extending flange 94, the handle 76 passing through the aligned openings. As shown in FIGURE 1, the flanges 94 extend outwardly beyond the edge of the cap 66 and are visible from the exterior of the faucet assembly. Each of the flanges may have inner and outer slanting surfaces 96 and 98, respectively, which permit the interior circular section of the handle to be reciprocated but yet closely held to the cap 66.

FIGURES 13 and 14 illustrate a variant form of sleeve. A sleeve 100 is formed from a single member 101 in which the opposite ends have outwardly extending flanges 102 defining openings 104. When the opposite ends of the sleeve 100 are put together, as illustrated in dotted lines in FIGURE 14, the flanges will define an opening 106. The finished sleeve in FIGURES 13 and 14 is the same as the sleeve illustrated in FIGURES 1 and 12.

The faucet arrangement illustrated in FIGURE 5 is essentially the same as that illustrated in FIGURE 1, except that the housing in FIGURE 5 is generally vertical and instead of a handle, there is a pivot cap for rotating and reciprocating the valve stem. In addition, the diverter 30 is somewhat different than the diverter 29. The same numbers have been given to identical parts in FIGURES 1 and 5. The collar 54 and its inwardly extending flange 58 hold a stop member 120, illustrated in FIGURES 6 and 7. The stop member 120 has a generally central aperture 122 and a pair of spaced downwardly extending parallel flanges 124 having outwardly extending flanges 126 at their bottom edges. The flanges 126 may be secured by the inwardly extending annular flange 58 on the collar 54. The stop member 120 has an extended stop portion 128 which is adapted to regulate movement of the pivot cap 130. There are a pair of spaced pivot stops, not shown, on the inside surface of the pivot cap and on opposite sides of the stop 128 so that the length of travel of the pivot cap 130 is controlled.

The pivot cap 130 may have an outer snap-in cover 132 which overlies a cavity 134 at the bottom of which is a suitable screw or the like 136 used in mounting the pivot cap to the top of the valve stem. The screw 136 passes downwardly through an arrangement of interlocking and overlapping spaced mounting members 138 and is threaded into the top of the valve stem.

The diverter 30 is illustrated in FIGURES 8 and 9 and may include a pair of spaced somewhat rounded rubber or rubber-like members 108 and 110 separated by an annulus of rubber or rubber-like material 112. The member 108 may be an O-ring and the member 110 may be an O-ring with one edge flattened off, as at 114. The annulus 112 may have a plurality of apertures or openings 116. The bottom of member 110 may have a plurality of spaced slits or cuts 118 which are useful in installation for enlarging the member 110. As shown in FIGURE 9, the slits are every 90 degrees but the invention is not limited to this precise number of slits or to this particular spacing.

The diverter 29 is generally the same as the diverter 30 with the exception of the lower ring. As shown in FIGURE 1, the lower ring 109 has an outer annular flange 111 which forms an annular cup-shaped opening 113. The flange 111 is effective to assist in forming a good seal for the entrance to passage 32. The diverters 29 and 30 are interchangeable as is the diverter shown in FIGURES 19 and 20.

FIGURES 19 and 20 show yet a further form of diverter for use in a faucet assembly of the type described. A metal collar 170 which may be formed by two identical valves held together by an O-ring or the like 172, has an upwardly and inwardly directed flange 174 for holding a metal sleeve 176. An O-ring 178 may be positioned near the top of the sleeve for sealing purposes. Within the metal sleeve 176 is a rubber or rubber-like sleeve 180 having an upper enlargement or ring 182 which fits against the upper end of sleeve 176 and a lower ring or enlargement 184. A web or sleeve 186 may connect the rings 182 and 184 and the web may have suitable openings or perforations 188. The bottom ring 184 may have slits or slots 190, similar to the slits 118 in FIGURES 8 and 9.

FIGURES 15-18 illustrate a mounting arrangement for a faucet assembly of the type described. A plate 140, generally long and narrow mounts the somewhat conical housing 13 and the valve body 20. The mounting arrangement illustrated in FIGURES 15-18 may mount any type of valve and faucet assembly to a sinkboard or the like, and the valve body 20 is merely used for illustration. The valve body may either be perpendicular to the plate 140, or inclined at an angle to it, as illustrated in the drawings. Hot and cold water conduits 142 and 144 may be connected to the hot and cold water inlets of the valve body 20 and may extend outwardly from the valve body and somewhat parallel to the plate 140. The conduits 142 and 144 each connect to a fitting 146 having a threaded cylindrical surface 148 extending downwardly through an aperture 150 in the plate 140. Each of the apertures 150 may be somewhat square in shape, as illustrated in FIGURE 15 and may have an elongated slot 152 at one side generally parallel to the conduits 142 and 144.

The upper portion of the fittings 146 may have a pair of parallel slots or grooves 154. A mounting member 156, illustrated in FIGURES 17 and 18, may be generally U-shaped and may have side members 158, the inner edges of which, indicated at 160, extend into the slots or grooves 154 for holding the fittings 146 to the plate 140. The outer portions of the sides 158 may have downwardly extending flanges 162 with a length slightly less than the length of the sides of opening 150. The flanges 162 extend downwardly through the openings 150, when the members 156 are assembled to the fitting 146, so that their bottom edges may be upstruck or crimped in any suitable manner, as at 164, to connect the flanges to the underside of the plate 140.

The use, operation and function of the invention are as follows:

FIGURES 1 and 5 illustrate a faucet assembly with a valve arrangement having a rotatable and reciprocal valve stem. Rotation and reciprocation of the stem is effective to mix hot and cold water and regulate the volume thereof. As shown in FIGURE 1, the valve housing is inclined to the vertical or to the mounting plate which is conventionally fastened to the sinkboard. This is a particularly decorative and advantageous arrangement.

The handle 76 used in FIGURE 1 may be manipulated to rotate and reciprocate the valve stem. In FIGURE 5 the handle has been replaced by a pivot cap 130, which can also be rotated and reciprocated to operate the valve cartridge. What is important about the assemblies shown in FIGURES 1 and 5 is that the manual operating means are interchangeable. The collar 54 may be used to fasten either the handle assembly or the pivot knob assembly to the valve body and housing. It is this interchangeability which provides ease of manufacture, distribution and sale.

The mounting arrangement itself is advantageous in that it is simple. A screw or similar fastening means is used to hold both of the manual operating means to the valve stem. In the case of FIGURE 1, the collar 54

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overlies an outwardly extending flange on the sleeve which mounts the handle.

The sinkboard mounting arrangement illustrated in FIGURES 15-18 is also unique and advantageous. Generally square shaped apertures are formed at opposite ends of the mounting plate 140 and then mounting members 158 are uniquely formed to connect the mounting plate to a fitting extending downwardly through the apertures. The fittings have grooves to receive the inwardly extending edges of the member 158 and the member 158 in turn has downwardly extending flanges which may be crimped or otherwise secured to the underside of the mounting plate 140.

A further advantage of the invention is the unique construction of the handle and the sleeve for mounting it. The sleeve itself may be plastic or any other suitable material which is flexible. In one form of the invention the sleeve is made in two symmetrical halves, with the halves together defining an opening for the handle. In FIGURES 13 and 14 the sleeve is made of a single somewhat flat member, the opposite edges of which, when held together, are effective to define an opening for the handle. The sleeve may be readily inserted in the cap simultaneously with the handle.

Whereas the preferred form of the invention has been shown and described herein, it should be realized that there are many modifications, substitutions and alterations thereto, within the scope of the following claims.

I claim:

1. A stem actuator assembly for use with a stem mounted within a housing for rotation and reciprocation comprising handle means at the upper end of the housing for rotating and reciprocating the stem, a removable collar secured to the upper end of the housing and having a flange overlying the upper end of the housing, said collar securing the said handle means, and a cap secured to said stem for movement with it, said cap surrounding the upper portion of the housing.

2. The structure of claim 1 further characterized in that the handle means extends outwardly from said housing.

3. The structure of claim 2 further characterized by a sleeve held to the housing by said collar, said handle means being loosely mounted on said sleeve.

4. The structure of claim 3 further characterized by and including an annular groove in said sleeve, said handle means having an annular section, a portion of which is received within said groove.

5. The structure of claim 2 further characterized by and including a rotatable cap secured to said stem for movement with it and mounted on the top of said stem, said handle means including a relatively long and thin portion extending outwardly from said cap.

6. A stem actuator for use with a stem mounted within a housing for rotation and reciprocation comprising a cap mounted above and surrounding an upper end of said housing and mounted to move with said stem in reciprocation and rotation, and a handle extending from the outside into said cap, there being within said cap and supported from said housing a fulcrum member for said handle, said fulcrum member including an annular groove extending about its circumference and a portion of said

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handle lying within said annular groove and surrounding said fulcrum member, said handle being effective to rotate and reciprocate said cap and with it said stem to which said cap is fixed.

7. The structure of claim 6 further characterized by the fact that said annular groove surrounds said stem.

8. A stem actuator of use with a stem mounted within a housing for rotation and reciprocation, said stem actuator including a cap positioned above and about said stem and secured thereto for movement therewith and an annular fulcrum member fixed to said housing and provided with an annular groove, a handle extending into said cap and pivotally positioned within and about said groove, said handle effective upon rotation to rotate said cap and said stem and upon reciprocation to move said handle and said stem longitudinally.

9. A stem actuator assembly for use with a stem mounted within a housing for rotation and reciprocation comprising a handle means at the upper end of the housing for rotating and reciprocating the stem, a removable collar secured to the upper end of the housing and having a flange overlying the upper end of the housing, said collar securing the said handle means, a cap secured to said stem for movement with it, the handle means extending outwardly from said housing, and a sleeve held to the housing by said collar, said handle means being loosely mounted on said sleeve, said sleeve having an annular groove, said handle having an annular section a portion of which is received within said groove.

10. The structure of claim 9 further characterized by and including an annular plastic sleeve positioned within said cap around the part of said handle means within said cap, an opening in said cap, a portion of said plastic sleeve extending outwardly through said opening and surrounding the handle adjacent said opening.

11. The structure of claim 9 further characterized in that said plastic sleeve is made up of two symmetrical sleeve sections, said sections being in abutment along an annular edge and each having portions extending through the opening in said cap.

12. The structure of claim 9 further characterized in that said annular sleeve is formed of a single flexible member, with opposite ends of said member being symmetrical.

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