July 7, 1964 J. A. COSPER 3,140,104

ADJUSTABLE WATER CLOSET COLLAR

Filed Oct. 27, 1960 2 Sheets-Sheet 1

Fig. 1.

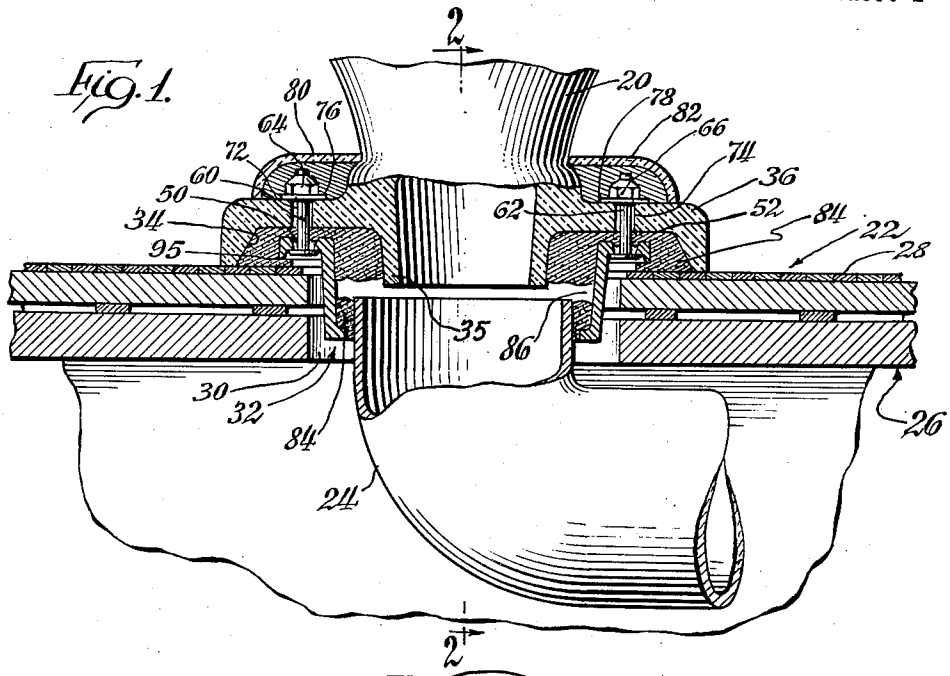
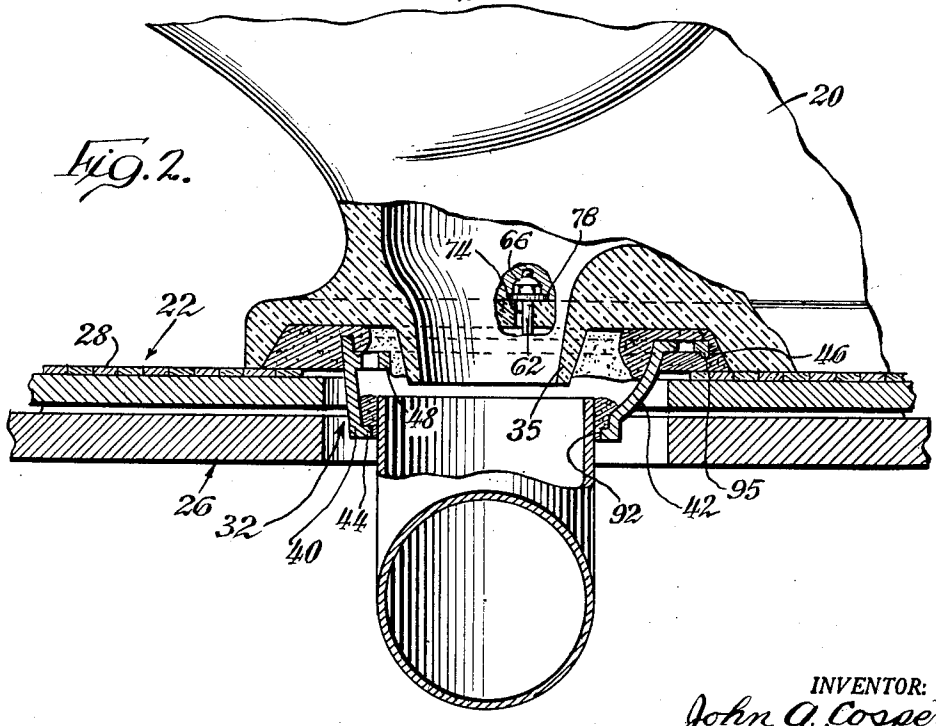


Fig. 2.



INVENTOR:
John A. Cosper
BY
Wupper, Gradolph & Love
Att'ys

July 7, 1964 J. A. COSPER 3,140,104

ADJUSTABLE WATER CLOSET COLLAR

Filed Oct. 27, 1960 2 Sheets-Sheet 2

Fig. 3.

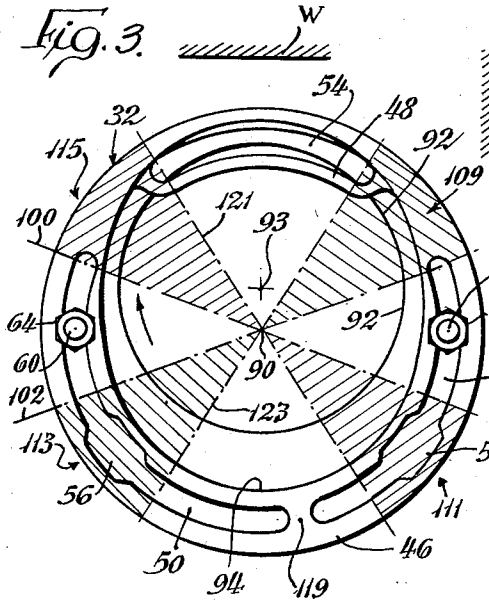


Fig. 4.

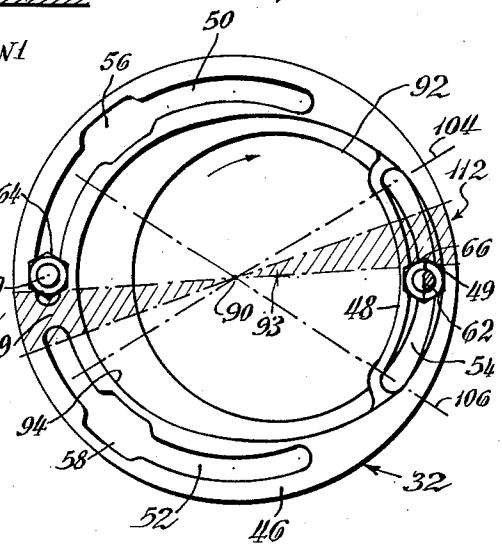


Fig. 5.

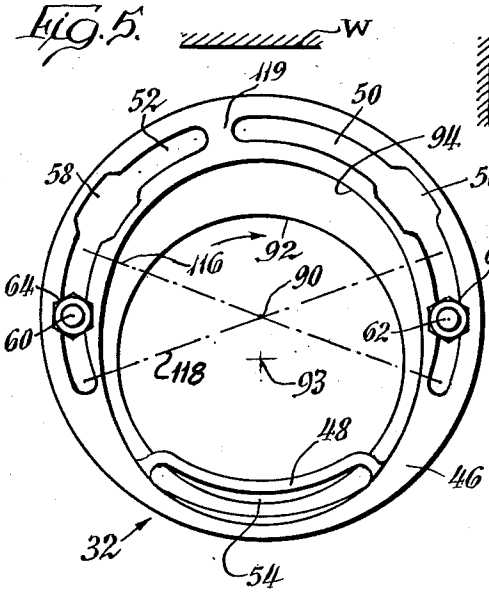
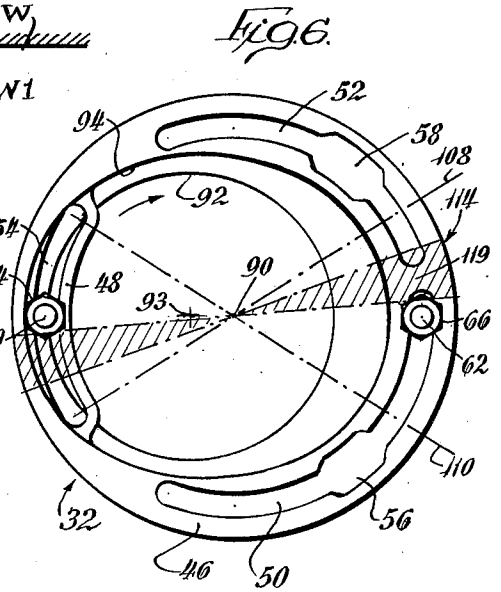


Fig. 6.



INVENTOR:
John A. Cosper.
BY
Wupper, Gradolph & Lowe
Attys

United States Patent Office 3,140,104 Patented July 7, 1964

3,140,104

ADJUSTABLE WATER CLOSET COLLAR

John A. Cosper, Birmingham, Ala., assignor to Cosper Manufacturing Company, Inc., Birmingham, Ala., a corporation of Alabama

Filed Oct. 27, 1960, Ser. No. 65,379
2 Claims. (Cl. 285—59)

This invention relates to an improved universal collar for use in mounting a water closet bowl over a plumbing pipe bend during the initial installation or replacement of a water closet fixture.

The use of collars for installing a water closet outlet in offset relation with the mouth or inlet of a pipe bend is known; however the range of this offset has been substantially limited in the known structures.

It is therefore a primary object of the present invention to provide in a collar adapted for mounting a water closet outlet in offset relation to the mouth of a cooperating pipe bend a high degree of flexibility whereby very small incremental adjustments may be made over a wide range.

It is another object of the present invention to provide a water closet collar which is substantially universal in mounting the water closet outlet in offset relation to the mouth of the pipe bend.

Other objects and the various features of the present invention will be apparent upon a perusal of the following description in which:

FIG. 1 is a fragmentary front elevation view, partially broken into section, showing the assembly of a water closet bowl, a pipe bend and one form of the improved water closet collar mounted in operational position through the floor of a bathroom or the like;

FIG. 2 is a fragmentary side elevation view partially in section substantially along line 2—2 of FIG. 1; and

FIGS. 3, 4, 5, and 6 are diagrammatic plan views of the collar illustrated in FIGS. 1 and 2 in four positions from which positions the collar may be moved through substantial angles.

As shown in the drawings, a water closet fixture having a bowl 20 is supported on a floor structure 22 immediately above the mouth of a cooperating pipe bend 24. The floor structure consists of the usual wood substructure 26 with tiles 28 overlying the substructure. An opening 30 is provided in the floor structure for receiving the upper end of the pipe bend and the improved collar 32. The collar 32 is received in an annular recess 34 within the lower base portion 36 of the water closet bowl and receives the upper end or mouth of the pipe bend 24 and a depending flange 35 forming the outlet of the water closet bowl.

The collar 32 comprises a generally vertical annular wall section 40, the forward portion of which is generally arcuate in cross section as shown at 42 (FIG. 2) for minimum resistance to the flow of waste. The lower end of the annular wall section includes an inwardly extending annular flange 44 which is positioned in closely spaced relation with the upper end of the pipe bend, and a generally arcuate flange 46 is provided at the upper forward end of the collar and extends circumferentially in both directions to positions closely adjacent the rear end of the collar with its radial dimension decreasing as it progresses rearwardly. An elongated generally arcuate internal flange 48 is formed within the collar at the rear end of the wall section 40. The flange 48 is spaced a short distance from the upper end of the collar. Elongated arcuate slots 50 and 52 are formed in the flange 46 and an elongated arcuate slot 54 is formed in the flange 48. The slots 50 and 52 have enlarged openings 56 and 58 for a purpose which will be described below.

As best seen in FIG. 1, the collar 32 is secured to the base 36 of the bowl by means of nuts 64 and 66 and screws 60 and 62 received through slots 50 and 52 in the collar flange 46 and openings 72 and 74 in the base. Washers 76 and 78 are interposed between the nuts 64 and 66 and the upper surface of the base 36, and nut covers 80 and 82 are used to conceal the nuts and bolts. A suitable packing or caulking material 84 is inserted within the cavity 34 of the water closet base and within the nut covers to prevent leakage of liquid from the base of the water closet. A suitable leaded caulking material 84 is received in the lower end of the cavity 86 in the collar to provide a cold joint seal between the collar and the upper end of the pipe bend.

With particular reference to FIG. 3, it will be seen that the periphery of the rear portion of the wall section 40 and the flange 46 is substantially circular about an axis 90; the flange 44 at the lower end of the collar defines a circular opening 92 which is on an axis 93 offset with relation to the axis 90; and the upper end of the wall section 40 defines a generally oval opening 94.

To assemble the water closet fixture in operating relation with the pipe bend 24, as shown in FIG. 1, the collar 32 will be positioned around the upper end of the pipe bend with the caulking compound 84 being inserted between the collar and the pipe bend and with caulking material being inserted under the upper end of the collar to raise the collar off the tile. The heads of the screws 60 and 62 are inserted through the openings 56 and 58, and the screws are moved in the slots 50 and 52 to diametrically opposed positions in which they will line up with the openings 72 and 74 in the base 36 when the base is in its installed position.

The bowl 20 with the caulking compound in its lower cavity 34 is then lowered over the collar with the screws being received through the openings 72 and 74. The lower headed ends of the screws are hexagonal and their rotation is prevented by the adjacent wall section 40 and a depending flange 95 at the outer end of the flange 46. The washers 76 and 78 are received on the screws, and the nuts 64 and 66 are threaded on the screws to maintain the collar and the base 36 in fixed relation. The covers 80 and 82 are then mounted on the base.

In the event that the connection between the collar and the base is to be made by means of the slot 54, then one of the screws 60 or 62 is received through the slot 54 and loosely secured to the flange 48 by means of a nut 49 (FIG. 4) to permit movement of the screw in the slot 54; and the other screw is received in one of the slots 50 or 52. Again the screws are moved to diametrically opposed positions in which they will line up with the openings 72 and 74 in the base. The base is then lowered into position over the collar, the screws being received through the openings in the base. When the bowl is properly positioned, it is secured to the collar by means of the washers 76 and 78 and the nuts 64 and 66. The adjacent wall section 40 prevents rotation of the screw in the slot 54.

FIGS. 3–6 illustrate various angular positions in which the collar 32 may be positioned relative to adjacent walls W and W1 without changing the positions of the screws. For the moment, it will be assumed that the installed position of the water closet fixture cannot be changed if the screw positions are not changed, the relative play between the screws and base provided by the elongated slots 74. When the axis of the mouth of the bend pipe 24 has been placed closely adjacent the wall W, for example 10", the collar will be positioned substantially as shown in FIG. 3. The collar may be rotated from this position clockwise or counterclockwise within limits defined by the lines 100 and 102, the axis 93 of the outlet following a circular path about the axis 90 to accommodate a bend

pipe having the axis of its mouth positioned substantially along this path.

If the pipe bend axis is further away from the wall W, i.e., in the order of 10" plus the distance between axes **90** and **93**, the collar may be positioned substantially as shown in FIGS. 4 or 6, from which positions the collar may be rotated within limits defined by lines **104** and **106** or **108** and **110** except for the shaded areas **112** and **114**.

For maximum positioning of the pipe bend axis from the wall W, i.e., 10" plus twice the distance between axes **90** and **93**, the collar may be positioned as shown in FIG. 5, from which position the collar may be rotated within limits defined by the lines **116** and **118**. In a typical collar, the slots **50**, **52** and **54** define angles in the order of 110°, 95° and 70° respectively; and the lines **104** and **106** and **108** and **110** define angles in the order of 66°; lines **100** and **102** and **116** and **118** define angles in the order of 42°; and the areas **112** and **114** define angles in the order of 15°. Thus the axis **93** may be moved in a portion of the circular path about the axis **90** in the order of 186°. These values are given by way of example, and the invention is to be limited only to the extent set forth in the appended claims.

The above description assumes that the screws **60** and **62** may not be located in any other position. Frequently the fixture is to be positioned with respect to the rear wall W only, in which case the screws may be moved along the wall W but still with the same spacing from the wall W.

This positioning of the collar either as shown in FIG. 4 or as shown in FIG. 6 permits rotation of the axis **93** of the outlet opening **92** to any position between lines **104** and **106** because the axis moves upwardly as with respect to the screws **60** and **62** in FIG. 4 and downwardly in FIG. 6. This extends the path available to the axis **93** to 216°.

Also, since the screws **60** and **62** may be moved toward the left or right with respect to FIG. 3, the outlet opening **92** may be aligned with the mouth of a bend pipe which has its axis any incremental distance from the wall W between the position of the axis **93** in FIG. 3 to the position of the axis **93** when the collar has been rotated in either direction to the positions shown by lines **100** or **102**, the distance between the wall W and the screws **60** and **62** being maintained constant. Similarly, the outlet opening **92** may be aligned with the mouth of a bend pipe having its axis spaced from the wall W within the limits defined by the position of the axis **93** as the collar is rotated in either direction from the positions shown in FIGS. 4–6 to its extreme positions indicated by lines **104** and **106**, **108** and **110**, and **116** and **118**.

Thus, between the extreme positions of FIGS. 3 and 5, there will be only two short ranges of distances from the wall W within which the axis **93** may not be positioned without moving the screws **60** and **62** toward or away from the wall. Assuming that only a predetermined maximum total length for the slots **50**, **52** and **54** is available, the improved collar provides for minimizing the ranges in which the axis **93** cannot be positioned without moving the screws **60** and **62** toward or away from the wall W. For a predetermined degree of rotation of the collar **32** from the positions of FIGS. 4 and 6, the axis **93** will be moved initially a maximum distance toward or away from the wall and that, for the same degree of rotation thereafter, the corresponding movement of the axis **93** toward or away from the wall W decreases progressively. On the other hand, for a predetermined rotation of the collar from the position shown in either FIGS. 3 or 5, the axis **93** will move initially toward or away from the wall W a minimum amount and will progressively increase. Since maximum rate movement of the axis **93** toward or away from the wall W in relation to collar rotation is provided at and adjacent the positions shown in FIGS. 4 and 6, the slot **50** permitting rotation from these positions is made longer than slot **52**, the supporting rib **119** between the slots **50** and **52** being offset in relation to a diametral line through the center of the slot **54** and the slot **54** is enlarged to permit greatest angular movement from these positions. Thus in the typical example described above, the collar may be rotated in the order of 33° in either direction from the positions shown in FIGS. 4 and 6 whereas it may be rotated only about 21° in either direction from the positions shown in FIGS. 3 and 5. As a result, a maximum amount of movement of the axis **93** toward and away from the wall W is provided for a predetermined total arcuate length of the slots.

In a water closet collar of this type which is adapted for use with a typical bend pipe size in the order of four and one-half inches O.D. and in which the maximum diameter of the collar body must be held to within the order of seven or seven and one-fourth inches, the ranges of the positions to which the axis **93** may not be moved without moving the screws is in the order of one-fourth inch. Movement of the screws one-eighth inch toward or away from the wall will permit positioning of the axis **93** in these ranges. The slots **72** and **74** and the play between the screws and the slots in which they are received permit one-eighth inch movement of the screws relative to the fixture and the collar is rendered completely universal. Thus the axis **93** may be spaced from the wall in any position between those shown in FIGS. 3 and 5 including positions in the shaded areas **109**, **111**, **112**, **113**, **114** and **115**.

It will be noted that the flange **48** has a small cross section; and, when the installation is made by use of the slots **50** and **52**, the installer will remove the flange **48** by sharp hammer blows.

While a preferred embodiment of the adjustable water closet collar of this invention has been shown and described, it will be apparent that numerous variations and modifications may be made without departing from the underlying principles of this invention. It is therefore desired, by the following claims, to include within the scope of the invention all such modifications and variations by which substantially the results of this invention may be obtained through the use of substantially the same or equivalent means.

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

1. In a water closet collar having a generally annular preformed hollow member with an elongated inlet opening at its upper end and a smaller offset circular outlet opening at its lower end for operably connecting the outlet of a closet bowl in noncoaxial relation with a closet bend pipe below the bowl, the improvement comprising an internal flange extending inwardly from the member below but in proximity to the upper end thereof at a position immediately above the smaller outlet opening and defining a first elongated arcuate slot therein, the slot describing an arc subtending an angle of approximately 70°, and an external flange extending outwardly from the upper end thereof from a minimum width at a position radially outward from the center of the internal flange to a maximum width diametrically opposite the central portion of the internal flange to define a generally circular outer periphery and defining a pair of elongated arcuate slots subtending a combined angle of approximately 205°, all of the arcuate slots having a common center offset from the center of the circular outlet toward the point of maximum width of the external flange along the major axis of the elongated inlet opening and being formed on equal radii, the slots cooperating to permit entry of diametrically opposed fastening members therethrough for selectively mounting the collar to the bowl in any one of a number of radial positions substantially in excess of 180°.

2. In a water closet collar having a generally annular preformed hollow member with an elongated inlet opening at its upper end and a smaller offset circular outlet

opening at its lower end adjacent one end of the elongation for operably connecting the outlet of a closet bowl in noncoaxial relation with a closet bend pipe below the bowl, the improvement comprising an internal flange extending inwardly from the member below but in proximity to the upper end thereof at a position immediately above the smaller outlet opening and defining a first elongated arcuate slot therein, the slot describing an arc subtending an angle of approximately 70°, a side wall portion opposite the flange sloping gently and smoothly from the inlet opening toward the outlet opening for minimum resistance to the flow of waste, and an external flange extending outwardly from the upper end thereof from a minimum width at a position radially outwardly from the center of the internal flange to a maximum width diametrically opposite the central portion of the internal flange to define a generally circular outer periphery and defining second and third elongated arcuate slots, the second and third slots describing arcs subtending angles of approximately 95° and 110° respectively, one portion of the third slot being diametrically opposite the central portion of the first slot, all of the arcuate slots having a common center offset from the center of the circular outlet toward the point of maximum width of the external flange along the major axis of the elongated inlet opening and being formed on equal radii, the slots cooperating to permit entry of diametrically opposed fastening members therethrough for selectively mounting the collar to the bowl in any one of a number of radial positions substantially in excess of 180°.

References Cited in the file of this patent

UNITED STATES PATENTS

812,543	Buchanan	Feb. 13, 1906
1,112,360	Crosby	Sept. 29, 1914
1,317,963	Cosgrove	Oct. 7, 1919
1,988,298	Burkett	Jan. 15, 1935
2,899,690	Clifford	Aug. 18, 1959
3,015,501	Minella	Jan. 2, 1962