Sept. 30, 1952 S. WANAMAKER 2,611,949

TOILET TANK FITTING HOLDING TOOL

Filed Oct. 8, 1949

Fig 1

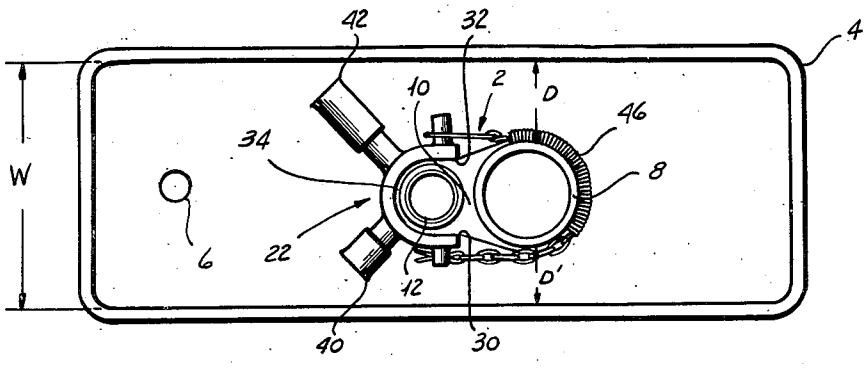


Fig 2

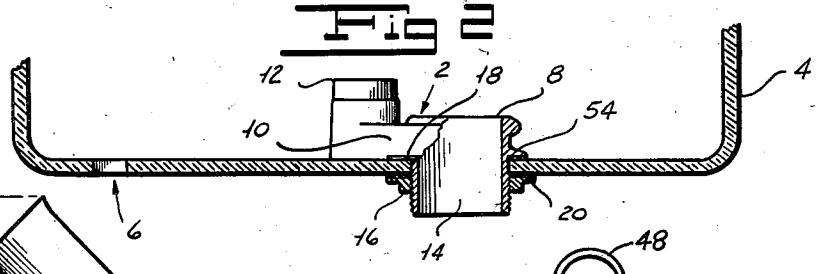


Fig 3

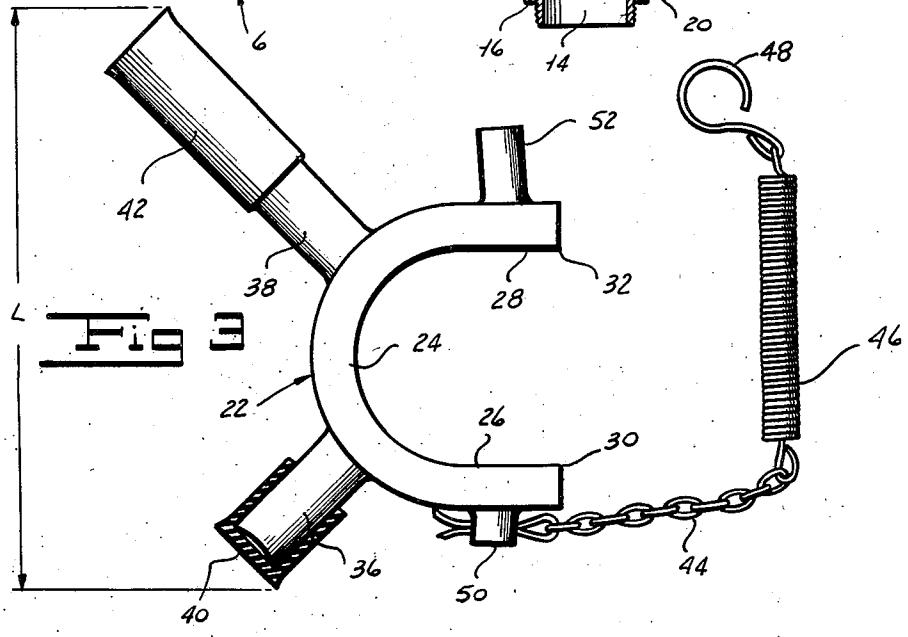
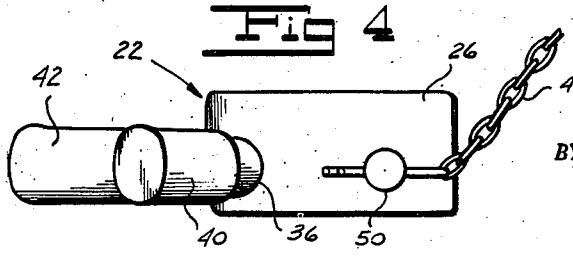


Fig 4



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TOILET TANK FITTING HOLDING TOOL

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5 Claims. (Cl. 29—285)

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This invention relates to a tool for assembling or disassembling a fitting such as the outlet fitting in a toilet tank.

The conventional toilet tank now employed in homes is made of ceramic materials such as fired clay or porcelain. The outlet connection to such tank is made by means of an outlet fitting disposed within the tank, a threaded extension on the fitting extending through a hole in the bottom of the tank, the sealing of the fitting to the tank and the holding of it in position, respectively, being accomplished by means of gaskets interposed between the fitting and the tank, and a nut exteriorly of the tank threaded on the extension of the fitting.

Because of the depth of the tank, it is very difficult, if not impossible, for a plumber in installing such fitting or in removing it from the tank, to hold the fitting from rotation while he is manipulating the fitting holding nut. Consequently, such operations usually require the efforts of two plumbers. When one plumber is working alone in such operations, it is sometimes the practice to block the outlet fitting against rotation as by interposing wooden blocks or the like between the fitting and the tank side walls. Such expedients are time consuming, and are uncertain in their effects. Furthermore, since the toilet tank is ordinarily made of ceramic materials, it is possible if such blocking is crudely done or if undue torque is exerted on the nut, so to wedge the blocking against the sides of the tank as to break the tank.

It is accordingly among the objects of the present invention to provide a simple, light, easily carried and easily applied fitting assembling and disassembling tool to make possible the above described fitting assembling and disassembling operations by one plumber.

A further object of the invention resides in the provision of a tool of the type described which minimizes the possibility of breakage of the toilet tank during the fitting assembling and disassembling operations.

These and further objects of the invention will be more readily apparent in the following description of a preferred embodiment of the fitting assembling tool of the invention.

In the drawing accompanying the specification and forming a part thereof:

Fig. 1 is a view in plan of a toilet tank with the discharge fitting assembled therein and with the assembling fixture of the invention applied to such fitting;

Fig. 2 is a view in vertical section through the tank, such view being taken from one side of the discharge fitting in the tank;

Fig. 3 is a view in plan of the fitting assembling tool of the invention; and

Fig. 4 is a view in end elevation of the assembling tool shown in Fig. 3.

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The outlet fitting for the tank 4 is designated generally by the reference character 2. Fitting 2 has a large outlet opening in the larger rounded end portion 8, such opening leading to the conventional toilet bowl. Tank 4 is shown as having the conventional inlet pipe accommodating opening 6 therein, the inlet pipe, the ball and valve, and the means selectively closing the outlet opening in fitting 2 of the tank being omitted. Fitting 2 has a partially oval extension 10 on one side thereof, as is clearly apparent in Figs. 1 and 2, the extension 10 lying in a plane parallel to the bottom of the tank 4. At the end of extension 10, which is hollow, there is provided an upstanding tapped boss 12 into which fits an overflow pipe (not shown) for the tank. As is well known, the shut-off ball or valve by which connection is effected between the interior of the tank and the delivery pipe to the toilet bowl fits within the upper end of the opening in the portion 8 of the fitting.

Fitting 2 is held in the tank by means of the threaded extension 14 on the bottom of the fitting, such extension fitting through a hole in the bottom of the tank. Extension 14 also affords the means of making a connection between the fitting 2 and the pipe leading to the toilet bowl. Nut 16 is threaded on extension 14 exteriorly of the tank bottom, as shown in Fig. 2. Sealing is effected between fitting 2 and the tank by means of gaskets, in the illustrative embodiment shown two such gaskets being employed, one at 18 being disposed between the bottom of fitting 2 and the inner bottom surface of tank 4, and the other, 20, being disposed between the outer bottom surface of tank 4 and the upper surface of nut 16.

It will be seen that, assuming that the thread on extension 14 of the fitting is a right-hand thread, when the plumber tightens the nut 16 in installing the fitting 2, such fitting, when unheld, will tend to turn counter-clockwise, as the fitting is shown in Fig. 1. Upon disassembly of the fitting from the tank, the fitting 2 will tend to turn clockwise, as it is shown in such figure.

The assembly fixture of the invention, designated generally 22, is designed to hold fitting 2 in a substantially fixed position within the tank 4 and to allow such assembly and disassembly operations to be carried on by one man working

from beneath the tank. The assembly fixture 22 has a main body portion generally of U-shape, the central or bight portion of the body being designated 24 and the two legs thereof, which extend generally parallel to each other, being designated 26 and 28, respectively. The inner bottom corners of such legs are relatively sharp, that is they preferably have an included solid angle of 90° or less. Such corners are designated 30 and 32, respectively. Fixture 22 is made of such size, and the inner surface thereof within the U is made of such shape, that the fixture fits over the extension 10 of the fitting in the manner shown in Fig. 1. As shown in such figure, legs 26 and 28 of the fixture extend parallel to the sides of extension 10 of the fixture for a substantial distance, the corners 30 and 32 having intimate and tight contact with the sides of the extension 10 at points materially spaced from the outer end of the extension. The inner configuration of body portion 24 of the fixture is made such that preferably there exists a substantial gap 34 between the inner surface of the bight portion 24 of the fixture and the outer end surface of the extension 10 of the fixture.

The U-shaped body of the fixture is of such height, as it lies on the tank bottom, that the arms extend upwardly to a distance which is at least a substantial part of the height of extension 10. Preferably the U-shaped body, including arms 26 and 28, is of a height at least equal to that of extension 10. When the assembly fixture is of such configuration relative to the fitting 2, it is stably held on the extension 10 of the fitting by means of the biting engagement between the edges 30 and 32 of the assembly fixture and the elongated sides of the extension 10.

In Fig. 1 the fitting 2 is shown disposed a distance D from the upper (as there shown) side of tank 4, and a distance D' from the lower (as there shown) side of such tank. As is evident, the distance D substantially exceeds the distance D'. For this reason the two tank side engaging buffers on the fixture 22 are of different lengths, as shown in Figs. 1, 3 and 4. The first such buffer comprising boss 36 is the shorter. Such boss extends angularly from body 22, as shown in Fig. 3, and has disposed on its outer end the rubber cap member 40. The second, longer, buffer comprising boss 38 is likewise angularly disposed with respect to the vertical axis of the body of fixture 22, as it is shown in Fig. 3. Boss 38 has telescoped thereover the rubber cap member 42. The distance L between the outer corner portions of the rubber caps 40 and 42 is made such that it is slightly smaller than the width W of the tank 4. The fixture 22 may thus be readily installed in the position shown in Fig. 1 when the extension 10 of the fitting 2 extends longitudinally of the tank. Bosses 36 and 38 diverge angularly from each other and from a plane at right angles to the U-shaped body of fixture 22 and positioned parallel to and midway between legs 26 and 28.

By reason of the internal configuration of the U-shaped body of the assembly fixture, the fixture remains stably on extension 10 when so placed, even though no further holding means for it is employed.

It is preferred, however, that fixture 22 be held on fitting 2 by further means, so that there is no possibility of the dislodging of the assembly fixture from its assembled position. The additional holding means of the preferred embodiment takes the form of a chain 44, a serially connected coil tension spring 46, and a hook 48 attached to the other end of the spring. Chain 44 is attached to the laterally projecting boss 50 on the outer side of leg 26 of the assembly fixture, as shown more clearly in Fig. 3. On the outer side of leg 28 of the assembly fixture there is provided an elongated boss 52, over which the hook 48 may be engaged. Spring 46 has turns of such diameter that they fit readily within the annular groove 54 provided about the portion 8 of fitting 2 in that portion which is opposite the extension 10 thereof.

Fixture 22 is first applied to extension 10 as shown in Fig. 1. The free end portion of spring 46 is then bent around part 8 of fitting 2 so as to fit within the annular groove 54 therein. The length of spring 46, taken in connection with the length of chain 44 and that of hook 48, is such that when hook 48 is placed over boss 52, with the fixture assembled as shown, the spring 46 is under appreciable tension.

The manner in which the fixture is used will, it is believed, be apparent from the foregoing description of it. When the fitting 2 is being assembled in tank 4, fixture 22 is, of course, assembled on extension 10 of the fitting as shown. The turning of nut 16 by a plumber working from beneath the tank 4 will result in the swinging of extension 10 of fitting 2 in a counterclockwise direction. Such swinging, however, continues for only that limited extent necessary for the outer edge of rubber bumper 40 to contact the bottom side of tank 4, as such tank is shown in Fig. 1. From this point on, regardless of the amount of tightening of nut 16, the fixture 2 is prevented from further turning. In the reverse operation, that is the disassembly of fitting 2 from the tank 4, the nut 16 is turned in the reverse direction. Thereupon extension 10 of fitting 2 swings clockwise, as it is shown in Fig. 1, only to that extent sufficient to bring the outer corner of rubber bumper 42 in contact with the upper inner surface of tank 4 as it is shown in Fig. 1.

The assembly fixture of the invention is simple, light in construction and is cheaply made. The main body portion may be made of cast iron or steel, or of any other metal of sufficient toughness and strength sufficient to withstand substantial mechanical shocks and to insure that the inner corners 30 and 32 of the legs do not become unduly blunted during use. Because the outer ends of the buffers, that is, the caps on bosses 36 and 38 engage the side walls of tank 4 at material distances from the vertical axis of the threaded extension 14 of fitting 2, the stress upon the tank sidewalls is much less than it would be if blocking extending at right angles to the longitudinal axis of extension 10 of the fitting and the tank wall or walls were employed. Thus the tool of the invention may be employed safely with tanks made of brittle material such as clay or porcelain. Ordinarily it requires more torque on nut 16 to disassemble the fitting 2 than to assemble it. The use of the long boss 38 is, therefore, of advantage in lessening the stress on the tank in the disassembly operation.

Whereas for purposes of illustration I have described and shown a preferred embodiment of the fitting assembling and disassembling tool of my invention, it will be obvious that the tool of the invention is capable of considerable variation as to details. The scope of my invention is there-

fore to be defined by the claims appended hereto.

I claim as new the following:

1. An assembling and disassembling fixture for the outlet fitting of a toilet tank, said outlet fitting having a rounded end portion having the main discharge opening therethrough and a laterally extending hollow portion having the overflow connection therein, said fitting lying on the bottom of the tank, the fixture comprising a main body portion of generally U configuration, the legs of the body portion lying generally parallel to each other and being spaced sufficiently to embrace the side surfaces of the extension on the fitting and of such length as to extend along a major portion of the length of such extension of the fitting, the inner confronting edges being sharp, two buffers on the outer surface of the bight of the U-shaped body, one buffer extending generally opposite to one leg and the other buffer extending generally opposite the other leg, the distance between the outer corners of the buffers being at least slightly less than the width of the toilet tank.

2. An assembling and disassembling fixture for the outlet fitting of a toilet tank, said outlet fitting having a rounded end portion having the main discharge opening therethrough and a laterally extending hollow portion having the overflow connection therein, said fitting lying on the bottom of the tank, the fixture comprising a main body portion of generally U configuration, the legs of the body portion lying generally parallel to each other and being spaced sufficiently to embrace the side surfaces of the extension on the fitting and of such length as to extend along a major portion of the length of such extension of the fitting, the legs having a height which is at least a substantial part of the height of the extension on the fitting, the inner confronting edges of the legs of the U-shaped body having included solid angles of no more than 90°, two buffers on the outer surface of the bight of the U-shaped body, one buffer extending generally opposite to one leg and the other buffer extending generally opposite the other leg, the distance between the outer corners of the buffers being at least slightly less than the width of the toilet tank, and means to retain the fixture in the recited assembled position on the fitting.

3. An assembling and disassembling fixture for the outlet fitting of a toilet tank, said outlet fitting having a rounded end portion having the main discharge opening therethrough and a laterally extending hollow portion having the overflow connection therein, said fitting lying on the bottom of the tank, the rounded end of the fitting having an annular groove thereabout, the fixture comprising a main body portion of generally U configuration, the legs of the body portion lying generally parallel to each other and being spaced sufficiently to embrace the side surfaces of the extension on the fitting and of such length as to extend along a major portion of the length of such extension of the fitting, the U-shaped body of the fixture having a height which is at least a substantial part of the height of the extension on the fitting, the inner confronting edges of the legs of the U-shaped body having included solid angles of no more than 90°, two buffers on the outer surface of the bight of the U-shaped body, one buffer extending generally opposite to one leg and the other buffer extending generally opposite the other leg, the distance between the outer corners of the buffers being at least slightly less than the width of the toilet

tank, and means to retain the fixture in the recited assembled position on the fitting, such last named means comprising a flexible member designed to fit within the annular groove on the rounded end of the fitting, means attaching one end of the flexible member to one leg of the U-shaped body of the fixture, and means for attaching the other end of the flexible member under tension, when about the rounded end of the fitting, to such other leg of the U-shaped body.

4. An assembling and disassembling fixture for the outlet fitting of a toilet tank, said outlet fitting having a rounded end portion having the main discharge opening therethrough and a laterally extending hollow portion having the overflow connection therein, said fitting lying on the bottom of the tank, the rounded end of the fitting having an annular groove thereabout, the fixture comprising a main body portion of generally U configuration, the legs of the body portion lying generally parallel to each other and being spaced sufficiently to embrace the side surfaces of the extension on the fitting, and of such length as to extend along a major portion of the length of such extension of the fitting, the U-shaped body of the fixture having a height which is at least a substantial part of the height of the extension on the fitting, the inner confronting edges of the legs of the U-shaped body having included solid angles of no more than 90°, two buffers on the outer surface of the bight of the U-shaped body, one buffer extending generally opposite to one leg and the other buffer extending generally opposite the other leg, the distance between the outer corners of the buffers being at least slightly less than the width of the toilet tank, and means to retain the fixture in the recited assembled position on the fitting, such last named means comprising an elongated coil spring having turns of such diameter as to fit within the annular groove on the rounded end of the fitting, means including a flexible member attaching one end of the spring to one leg of the U-shaped body of the fixture, and means for attaching such spring under tension, when about the rounded end of the fitting, to such other leg of the U-shaped body.

5. An assembling and disassembling fixture for the outlet fitting of a toilet tank, said outlet fitting having a rounded end portion having the main discharge opening therethrough and a laterally extending hollow portion having the overflow connection therein, said fitting lying on the bottom of the tank, the rounded end of the fitting having an annular groove thereabout, the fixture comprising a main body portion of generally U configuration, the legs of the body portion lying generally parallel to each other and being spaced sufficiently to embrace the side surfaces of the extension on the fitting, and of such length as to extend along a major portion of the length of such extension of the fitting, the U-shaped body of the fixture having a height at least substantially as great as the height of that of the extension on the fitting, the inner confronting edges of the legs of the U-shaped body having included solid angles of no more than 90°, two buffers on the outer surface of the bight of the U-shaped body, one buffer extending generally opposite to one leg and the other buffer extending generally opposite the other leg, each buffer including at its outer end an elastomeric cap member, the distance between the outer corners of the caps being at least slightly less than the width of the toilet tank, and means to retain

the fixture in the recited assembled position on the fitting, such last named means comprising an elongated coil spring having turns of such diameter as to fit within the annular groove on the rounded end of the fitting, means including a flexible member attaching one end of the spring to the outer side of one leg of the U-shaped body of the fixture, and means including a boss on the outer side of the other leg of the U-shaped body and a hook on the free end of the coil spring for attacking such spring under tension, when about the rounded end of the fitting, to such other leg of the U-shaped body.

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