

J. J. DONOVAN.
FLOOR CONNECTION.
APPLICATION FILED AUG. 25, 1910.

988,555.

Patented Apr. 4, 1911.

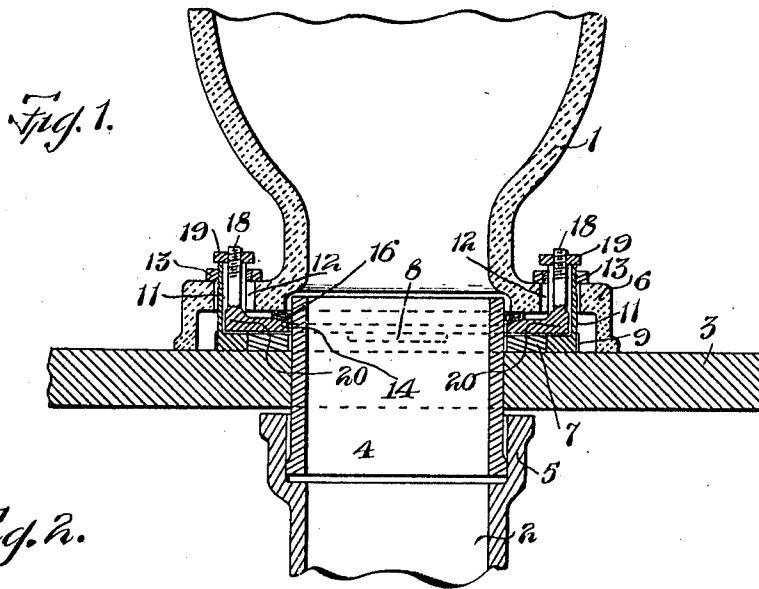


Fig. 2.

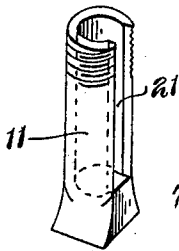


Fig. 3.

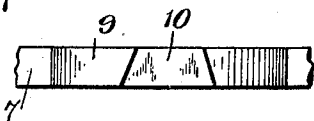


Fig. 4.

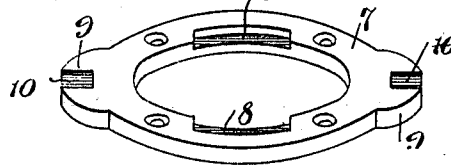


Fig. 5.

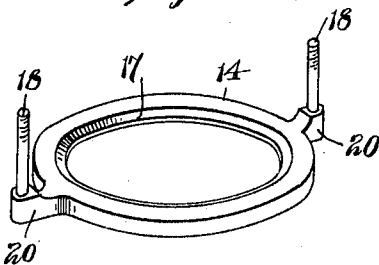
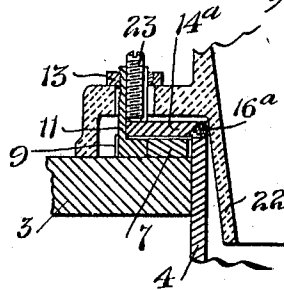


Fig. 6.



Witnesses:

J. P. Pizzetti
E. Batchelder

Inventor:
By John J. Donovan,
Berghel Brown Durand & May
Attys.

UNITED STATES PATENT OFFICE.

JOHN J. DONOVAN, OF BOSTON, MASSACHUSETTS.

FLOOR CONNECTION.

988,555.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed August 25, 1910. Serial No. 578,948.

To all whom it may concern:

Be it known that I, JOHN J. DONOVAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Floor Connections, of which the following is a specification.

The present invention relates to a means or mode of making an air tight connection between a drain pipe or soil pipe and a plumbing fixture which is arranged to discharge directly into the drain pipe. Many fixtures used in plumbing such as lavatories, tubs and sinks, empty directly into traps in which a water seal is maintained to prevent backing up of sewer air. There are other fixtures however including mainly water closets and slop sinks which are so constructed as to contain in themselves a water seal and discharge directly into the drain pipe, and it is to this last named class of fixtures that the present invention relates. Such fixtures ordinarily rest upon the floor and the connection with the drain pipe is at or through the floor, and for this reason I have termed the connection which forms the subject of the present invention a floor connection and shall refer to it from time to time in the following specification by this term. I desire it to be understood however that the term is one of convenience mainly and that I define it as meaning the connection which is made between the water closet or analogous fixture and the pipe, whether such connection is actually in the floor or not and regardless also of whether the fixture actually rests upon the floor or upon a support other than the floor.

Having thus defined the general nature of the invention I will now state the objects for which I have devised the improvements which constitute the subject matter of this application and are hereinafter described in detail. In order to explain these objects it is necessary first to indicate briefly the character of the floor connection which is at the present time in most general use. The most common type of such connection includes between the iron soil pipe and the fixture a brass calking nipple, a lead pipe which is soldered to this nipple and a flange soldered to the lead pipe and fastened to the fixture. The fixture rests on the floor and has its outlet in the form of a spigot or nipple extending below its base and entering the upper

end of the lead pipe section to some extent. The latter projects through the floor on which the fixture rests and is surrounded at its upper end by a flange usually of brass, which is soldered to it and rests upon the floor. The lower end of the lead pipe section is soldered to the brass nipple which in turn projects into the hub of the cast iron soil pipe and is made tight therewith by a calked lead joint. The joint between the lead pipe and the spigot or nipple is packed with soft material such as a rubber gasket, putty, gum, wax, graphite, etc., on account of the fact that the fixture, particularly when the same is a water closet, is ordinarily made of earthenware and is brittle. When the fixture is placed upon the floor as described it is secured by bolts held in the flange above mentioned and passing through the base of the fixture, on the protruding ends of which bolts are screwed nuts. When the nuts are tightened up the base of the fixture is pressed against the floor and the fixture is thus secured against displacement. The efficacy of the joint between the nipple of the fixture and the soil pipe however depends altogether upon the care with which the putty or other packing is packed about the joint, and if the packing should shrink or should be so carelessly applied as to leave openings and not be perfectly air tight there is no way of compressing it so as to close such openings. This is on account of the fact that any additional pressure applied to the nuts simply crowds the base of the fixture more firmly against the floor but does not bring the fixture and pipe into closer engagement or compress the packing in any way on account of the resistance of the floor and of the fact that the pipe is inextensible. Hence it is possible for the joint to be so loose and so inefficiently packed as to permit escape of sewer air. No ready means exists for detecting such a leak because the projecting nipple extending into the pipe prevents the water from leaking without preventing outflow of rising air.

My invention is designed to do away with the expensive fittings between the soil pipe and fixture and with the expensive labor necessary to install such fittings, thereby making the connection less expensive, and also to enable a perfect joint between the pipe and fixture to be maintained so that escape of sewer air may be prevented.

A further object is to make the joint of such a character and arranged at such a point that an annular space containing water for a water seal is provided, and if the joint is not perfectly tight the water may escape and so give warning of leakage by appearing on the floor or the ceiling below, and also to provide means by which any leakage which may occur may be immediately and easily stopped and the joint made perfectly tight without the necessity of removing the fixture or disturbing any connections.

The manner in which I put my invention into practical form is described in detail in the following specification and illustrated in the accompanying drawings, which latter show the preferred embodiment of my invention and also one of many modified constructions in which the essential principles of the invention may be embodied.

In the drawings—Figure 1 is a vertical central sectional view of the complete device. Fig. 2 is a perspective view of one of the main holding bolts. Fig. 3 is a fragmentary elevation of one side of the holding ring showing the means for engaging the lower end of the bolt. Fig. 4 is a perspective view of the ring. Fig. 5 is a perspective view of the packing member or gland. Fig. 6 is a fragmentary sectional view illustrating one modified embodiment of the invention.

Referring to the drawings, the fixture for which my improved connection is designed is represented by the character 1, and the soil or drain pipe by 2. The fixture rests upon a floor or other support 3 and the soil pipe is below the floor. A section of pipe 4, which may be any ordinary cast iron pipe of the proper size, is mounted in the hub 5 on the soil pipe and secured therein in any approved manner as by the ordinary calked lead joint. The section 4 passes through the floor and rises above the same a suitable distance, for instance, about an inch and a half.

The fixture 1 has a base 6 which rests upon the floor 3 and is recessed in its under side to receive the end of the pipe 4 and parts associated therewith, the width of the base being enough greater than the diameter of the pipe to receive these parts. Surrounding the pipe 4 and resting on the floor is a ring 7 of any suitable material such as cast iron, which is secured either to the floor or to the pipe. Where the floor is of wood the ring 7 may be secured by screws passing through it embedded in the wood and where the floor is of concrete, stone or other material unfit to receive screws or nails it may be secured to the pipe by such means as a lead gasket flowed into the space between the ring and pipe and calked. The ring is provided with pockets which receive the

lead forming the gasket. On the outside of the ring 7 and preferably at diametrically opposite points thereon, are pairs of lugs 9 between the members of each pair of which is left a space 10. In each of such spaces is set the base of a bolt 11 which rises through an aperture 12 in the base of the fixture and protrudes from the upper side of such base. The inner sides of the lugs 9 are made sloping and the bolt is enlarged at its lower end and made of non-circular outline so that it fits between the lugs and is held thereby both against rotation and against being withdrawn endwise. Nuts 13 are screwed upon the bolts and serve to fasten the fixture in place with sufficient firmness to prevent accidental dislodgment.

Above the ring 7 is a second ring 14 which I term a packing ring or gland, and between the latter and the underside of the base is contained a mass of packing 16. Such packing may be a rubber gasket, a mass of putty or any other elastic or plastic substance which answers the requirements of plumbing and building regulations for making a joint air-tight. The surface 17 of the gland against which the packing rests is beveled inwardly and downwardly so that when the gland is drawn toward the base of the fixture the packing is forced inward against the pipe. Means for thus moving the gland and compressing the packing is provided in the form of studs 18 which are formed integrally with or secured to the ring 14 and project upwardly through apertures in the base of the fixture. Nuts 19 are threaded on the ends of these studs and serve to accomplish this purpose.

Preferably the studs 18 pass through the same apertures in the base which contain the bolts 11 and preferably also they are so arranged that the nuts 19 which take up the gland and compress the packing abut on the ends of the bolts and transmit their pressure directly to the floor rather than against the base of the fixture. For this purpose the studs are offset somewhat from the outer circumference of the gland, being formed upon radial lugs 20 thereof, and are contained with these lugs inside of the bolts 11. The latter are made hollow in their upper parts and have in one side a slot 21 through which the lugs 20 pass.

In assembling the bolts and gland the former are first set into the notches 10 between the lugs 9 with their slotted sides inward and the gland is then placed with its studs and lugs directly above the bolts and the slots 21 therein respectively. The gland is then lowered until it rests on the ring 7, its lugs 20 passing downward into the slots of the bolts. All this is done before the fixture is put in place. When the latter is lowered into position after being turned so that its apertures or bolt holes 12 are above

the bolts the bolts and studs are received in these apertures. The nuts 13 and 19 are then placed successively on the bolts and studs and can be tightened independently to clamp the
 5 base of the fixture against the floor and to compress the packing. This is one of the most important features of the invention, namely, that the packing can be compressed independently of the means which clamp the
 10 fixture upon the floor, and thus without requiring the fixture to be removed or disarranged in the least in case it should be necessary to stop a leak. Another important advantage is that the construction described
 15 enables the recess in the base of the fixture to be enough larger than the pipe end and associated parts, to enable the fixture to be set up slightly out of line with the pipe, as in case the pipe end should not be perfectly
 20 vertical or the floor should not be level or it should be desirable for any purpose to slant the fixture one way or the other. As is shown in the drawing there is some space between the inner circumference of the gland
 25 and the piping, and also between the outer parts of the gland and pipe and the inner surfaces of the fixture, thereby even though the fixture is not in proper alinement with the pipe yet it is possible to take up the
 30 gland in such a way as to compress the packing all around the joint between the fixture and pipe. Still another advantage arising from my improvement is that the pipe
 35 4 need not be accurately cut or finished on its upper end. Some fixtures require that the end of the corresponding pipe make contact with the fixture and therefore that it be finished accurately and smoothly. In my
 40 invention as the joint is outside of the pipe end such end need not make contact at any point with the fixture and so may be cut roughly and without any high degree of accuracy. The pipe 4 may be an end of any
 45 sort of pipe cut off in the ordinary manner and within a quarter or half inch of the required length.

The location of the packing for the joint is slightly below the end of the pipe, and between the latter and the inside of the fixture
 50 base is left an annular space into which water may flow. When the packing is sufficiently tight the water lies in this annular space and provides a liquid seal against the escape of the sewer air. In case, however,
 55 the packing should be insufficiently tight, the water will leak through, and by appearing on the floor or on the ceiling below, will show that the joint is not sufficiently tight and therefore that leakage of sewer air is
 60 occurring. This particular joint therefore serves both to provide a liquid seal and as a leak detector.

In Fig. 6 I have shown one of several other forms in which the essential principles of my invention may be embodied. In
 65

this drawing there is shown one of the most common water closet fixtures having the spigot or nipple 22, hereinbefore referred to. The drain pipe 4, ring 7, bolts 11 and nut 13
 70 are the same as previously described with the exception that the bolts are internally threaded. The gland 14^a differs from the gland 14 in that the beveled surface is on its underside and the packing 16^a is contained
 75 between this beveled surface, the nipple 22, the ring 7 and the pipe 4. Furthermore the gland 14^a is without the studs 18 and in place of the latter there are provided set-screws 23 independent of the gland which
 80 are engaged with the internal thread of the bolts 11 and bear on the upper side of the gland. When these set-screws are screwed down they compress the packing against the
 85 end of the pipe and the outer side of the nipple thereby making an air-tight joint. Essentially however the invention is the same in that the means for compressing the
 90 packing passes through the same apertures in the base of the fixture as do the bolts 11 and are operable independently of the nuts coacting with these bolts to secure the
 95 fixture to the floor.

I claim:—

1. The combination with a drain pipe of a fixture resting on the floor and having a
 95 recessed base into which the pipe extends, a ring surrounding the pipe and rigidly fastened relatively to the fixture, bolts fastened at their lower ends to said ring and passing
 100 upward through the fixture base, nuts threaded on said bolts securing the fixture in place, a gland surrounding the pipe above the first-named ring, packing surrounding the pipe between said gland and the base, and means passing through the base for
 105 drawing the gland toward the base and thereby compressing the packing to make an air-tight joint between the pipe and fixture.

2. The combination with a drain pipe of a fixture resting on the floor and having a re-
 110 cessed base into which the pipe extends, a ring surrounding the pipe and secured with respect thereto, bolts fastened at their lower ends to said ring and passing upward through the fixture base, nuts threaded on
 115 said bolts securing the fixture in place, a gland surrounding the pipe above the first-named ring, packing surrounding the pipe and engaging a beveled face of the gland, and means for actuating the gland to compress the packing into the joint between the
 120 pipe and fixture, thereby making such joint air-tight.

3. A floor connection for fixtures of the character described comprising the combina-
 125 tion of a fixture having a base, a drain pipe extending from the base, packing between the pipe and base, means for securing the base to a support and independently operated means for crowding the packing
 130

against the pipe and base to make the joint between the two air-tight.

4. In combination with a fixture of the character described and a drain pipe, a base on the fixture having a recess to receive the end of the drain pipe, bolts secured at their lower ends to the support for the fixture and passing upward through the base, nuts on such bolts bearing against the base to secure the fixture upon the support, packing between the pipe and fixture, a gland operable to compress the packing into the joint between the pipe and fixture to make such joint air-tight and means passing through the bolts for actuating said gland so as to compress the packing, said means and bolts being so arranged that the thrust of the means is taken by the bolts.

5. The combination of a plumbing fixture, a support on which the latter rests, a drain pipe extending through the support in line with the outlet of the fixture, packing arranged to close the joint between the pipe and fixture, means for clamping the fixture upon the support, and independent means for taking up the packing.

6. The combination of a plumbing fixture, a support, a drain pipe in line with the outlet of the fixture, a gland arranged between the base of the fixture and the support and surrounding the pipe, a packing contained between the pipe, the base of the fixture and the gland, and means for drawing said gland

toward the base to compress the packing against the same and against the pipe.

7. The combination of a plumbing fixture having a base, a drain pipe in line with the outlet of said fixture, packing surrounding the pipe and underlying the base of the fixture, means for compressing said packing against the pipe and the fixture base, and means independent thereof for securing the fixture in place, the fixture being formed with an annular space surrounding the end of the pipe to provide a liquid seal in connection with the packing to prevent escape of sewer air.

8. The combination of a plumbing fixture adapted to rest upon a floor or other support, a drain pipe projecting through the floor and into a recess in the base of the fixture in line with the outlet thereof, means for securing the fixture upon the floor, a packing surrounding the pipe, and means independent of the fixture-securing means for compressing said packing against the pipe and the fixture base, the latter having a space surrounding the pipe end to receive water.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOHN J. DONOVAN.

Witnesses:

ARTHUR H. BROWN,
FOREST R. ROULSTONE.