

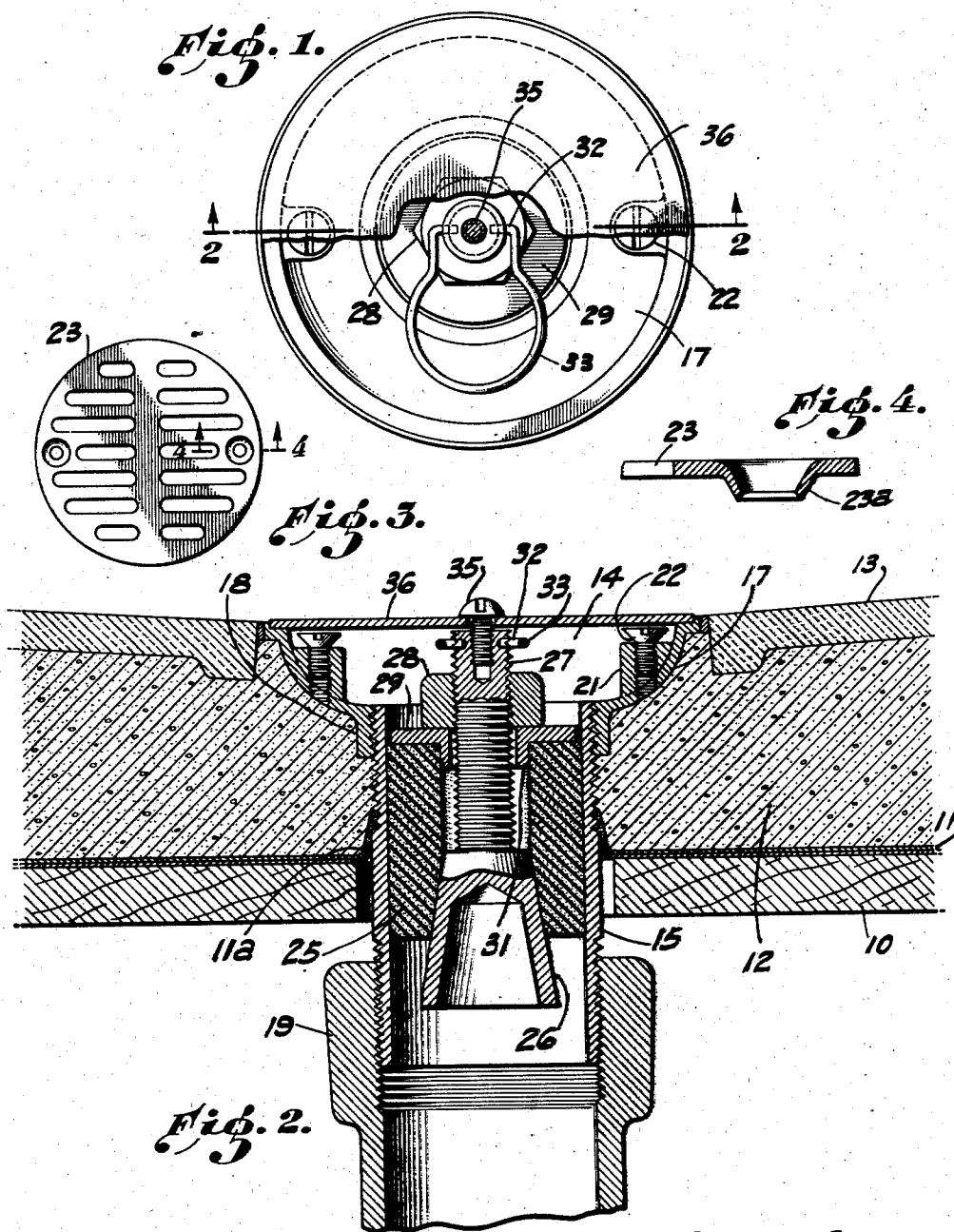
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PIPE PLUG

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PIPE PLUG

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This invention relates to pipe plugs of the elastic or expansible type.

In the plumbing field, having particular reference to the operation of installing floor drains and testing plumbing to detect leaks, if any, the usual procedure is for the plumber to rough in the plumbing preparatory to testing and then to call in the tile mechanic to lay the cement floor and tile. In roughing in the plumbing, the plumber adds a cap to the drain pipe, said cap being removed after the tile mechanic has applied the tar paper or lead pan on the sub floor preparatory to installing the cement base for the tile.

In tarring the paper to the drain pipe, the hot tar is slushed onto the pipe threads adjacent the cap and also onto the cap, so that when the plumber is recalled after making his test to detect leaks, to substitute the floor drain for the cap, the cap is so firmly affixed to the drain pipe that in an effort to unscrew it therefrom it not infrequently occurs that the pipe is unscrewed from the trap instead of the cap being unscrewed from the pipe. During this operation the paper and tar waterproof condition around the drain is often destroyed, and if only a crack should occur which would not be visible on inspection, it would result in moisture seeping through the cement around the drain, thereby producing a destructive rot in the adjoining wood floor.

Furthermore, cement, plaster, and foreign matter finds its way into the trap through the strainer plate even though certain precautions guarding thereagainst may have been taken, tending to stop up the trap when the drain is eventually put into use.

The general object of this invention is to provide an improved elastic plug insertable into the mouth of an open pipe or hole which will facilitate the operations of installing plumbing, tile, and cement floor surrounding plumbing fixtures such as are employed in shower drains and the like, without unnecessary trips being made on the part of the plumber in cooperation with workmen doing other jobs in the building, thus obviating the difficulties set forth in the above description.

Another object is to provide a pipe plug radially and circumferentially expansible outwardly by traction applied to a frusto-conical member movable longitudinally within the mouth portion of the plug.

Another object is to provide a pipe plug for floor drain recesses, having a sealing function when installed in a pipe, in combination with imperforate means acting as a safety closure during the interim each plug may be in use.

Another object is to provide an improved plug in combination with a floor drain which has an element manually movable axially therein in reverse directions to cause a radially outward and inward expansion on contraction of the plug during its axial movement therewithin.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of that which is claimed without departing from the spirit of the invention.

The following is a brief description of the figures of the drawing:

Fig. 1 is a plan view showing the device installed in the operative position in a conventional floor drain, a portion of the imperforate cover being broken away in order to disclose underlying structure.

Fig. 2 is a section taken on line 2-2 of Fig. 1. In said view is shown a portion of a shower floor, drain, and trap with which the invention is related.

Fig. 3 is a plan view of the detached strainer plate, and,

Fig. 4 is a section taken on line 4-4 of Fig. 3.

Referring in detail to the drawing, in Fig. 2 is shown in section a floor structure including the subfloor 10 overlaid by layers of tar paper 11 above which is the cement body portion 12 of the floor. The upper surface of the floor is covered by tile 13 which is shown in a slightly downwardly inclined relation to the drainage recess 14 downwardly from which drainage is effected through the pipe section 15. A fluid-tight joint is made between the pipe section 15 and the tar paper 11 by upwardly directing the latter at 11a and coating this part of the paper with liquid tar. Said drainage recess 14 is lined by a basin structure 17 furnished with a downwardly directed, annular, bottom flange 18 which is internally screwthreaded to screw onto the afore-said nipple or pipe section 15, the lower end of which is shown screwed into the upper part 19 of a conventional trap. The lining 17 is furnished internally with lugs 21 having screwthreaded sockets to receive screws 22 for attaching the conventional strainer plate 23.

Owing to the fact that the strainer plate 23 is furnished with apertured attaching lugs 23a of a countersunk, downwardly projecting character the lugs 21 within the drainage recess 14 are

placed low enough to leave considerable clearance above them, thus providing sufficient room for the heads of the screws 22 when said screws are inserted to stop up the bores which they occupy.

By the invention there is provided the thick walled, expansible tubular member 25 desirably made of rubber or rubber-like material, the normal external diameter of which is slightly less than the internal diameter of the drainage pipe section 15. Said tubular member, shown in its operative position, is expanded by means of a rigid frusto-conical follower plug 26 having in fixed relation to it a screwthreaded stem 27 which projects axially from its smaller end. Said stem projects upwardly beyond the top of the tube 25 and has a nut 28 screwed onto its projecting portion. Said nut engages the upper face of a buffer washer 29 seated upon the upper end of said tube 25. Said washer, by preference and as shown, has a downwardly directed central annular flange 31 which fits snugly within the upper end of the tube 25.

The upper end of the stem 27 is furnished with diametrically opposite seats which receive the inwardly directed end portions 32 of the resilient wire bail 33 which serves as a handle for said stem together with the assembly of parts of which it forms an element.

In the upper end of said stem 27 is an axial, screwthreaded bore into which screws a screw 35 whereby a protecting cover plate 36 is temporarily attached, said plate being imperforate except for the hole centrally provided therein to receive said screw.

Ordinarily, the only portion of the floor proper which is in place when the device is installed is the sub floor 10, the drainage pipe section 15, together with the basin structure 17 mounted thereon, being supported by the conventional sewer trap 19, the upper portion of which is shown in Fig. 2.

Preparatory to installing the expansible portion of the device in its operative position, the conventional strainer plate will be detached and the expansible cylindrical member 25 in a normally unexpanded condition will be inserted downwardly through the drainage recess 14 into the drainage pipe section 15 to approximately the position shown in Fig. 2. The parts which cooperate with said member 25, namely the frusto-conical follower plug 26, together with its threaded stem, the nut 28, and the buffer washer 29, will accompany said member 25 when the latter is put into place as stated, but only a small part of the upper end of the frusto-conical member 26 will be contained within the lower end of the tubular member 25. At this time said member 25 must be maintained in a non-expanded condition. A suitable wrench may now be applied to the nut 28, and said nut thereby rotated in a direction to force a greater amount of the force to conical member 26 upwardly into the tubular member 25 until said member is expanded with sufficient tightness against the interior surface of the drainage pipe 15.

After the plug assembly has expanded in its operative position as above stated, the safety cover plate 36 is attached to the stem 27 by means of the screw 35, thus completely protecting the drainage recess 14 from the entrance of foreign matter. It will be understood that before said cover plate is attached, the screws 22 will be screwed downwardly into their sockets a sufficient distance to unobstruct attachment of the

plate 36, these screws serving to prevent the cement 12, when put in place, from entering and clogging up the screw holes.

At any time after the expansible plug structure has been installed in the manner stated, the plumbing system of which the trap 19 forms a part, may have water introduced into it under pressure to make the leak detecting test required. The tar paper 11 with its upturned part 11a adhered in a leak-proof manner to the pipe section 15 may next be applied preparatory to laying the cement body 23 and the tile floor 13 carried thereof.

After the plumber returns to install the finished plumbing, he will remove the plug assembly and safety plate 36 and substitute for the latter the strainer plate 23.

Although the device has been illustrated and described associated with a floor and plumbing fixture, yet it is to be understood that its use is by no means restricted to such a situation, but it may be installed within a great variety of tubular structures without departing from the spirit of the claimed invention.

What is claimed is:

1. In an expansible plug structure, a diametrically expansible tubular member of rubber like compressible material insertible through the open top of, and fitted within the upper part of a drain pipe section subjacent a floor drain recess, a rigid frusto-conical follower plug having its smaller end portion fitted within the lower end portion of said tubular member, a screwthreaded stem projecting from said smaller end of said follower plug in a fixed, axial relation thereto, said projecting part of said stem being provided with diametrically opposite inwardly directed slots, a buffer washer seated upon the end of said tubular member which is opposite to said follower plug, a nut abutting against the outer face of said washer and having a screwthreaded relation to said stem for applying traction thereto thereby to cause said follower plug to diametrically expand said tubular member, and a resilient bail-like wire handle provided with inwardly directed end portions occupying said slots.

2. The subject matter of claim 1 and, said stem having a screwthreaded bore in its upper end, a temporary cover plate for said recess having a central hole through it, and an attaching screw for said cover plate extending through said hole and screwable into said bore, said cover plate being imperforate except for said central bore.

3. In combination, a floor structure having a drainage outlet construction which includes a floor drain recess and a drain pipe section leading from said recess downwardly through the floor, a diametrically expansible tubular member insertible through the open top of, and fitted within the upper part of said pipe section, a rigid frusto-conical follower plug having its smaller end portion fitted within the lower end portion of said tubular member, a screwthreaded stem projecting from said smaller end of said follower plug in a fixed axial relation thereto, a buffer washer seated upon the upper end of said tubular member, a nut abutting against the upper face of said washer and having a screwthreaded relation to said stem for applying traction thereto thereby to cause said follower plug to expand said tubular member, said stem having a screwthreaded bore in its upper end, a temporary cover plate for said recess having a central hole through it, and an attaching screw for said cover plate

extending through said hole and screwed into said bore, said cover plate being imperforate except for said central bore.

4. In combination, a floor structure having a drainage outlet construction which includes a floor drain recess and a drain pipe section leading from said recess downwardly through the floor, a diametrically expansible tubular member insertable through the open top of said pipe section and fitted within the upper part thereof, a rigid frusto-conical follower plug having its smaller end portion fitted within the lower end portion of said tubular member, a screwthreaded stem projecting from said smaller end of said follower plug in a fixed axial relation thereto, said projecting part of said stem being provided

5 with diametrically opposite inwardly directed slots, a resilient bail-like wire handle provided with inwardly directed end portions occupying said slots, a buffer washer seated upon the upper end of said tubular member, a nut abutting against the upper face of said washer and having a screwthreaded relation to said stem for applying traction thereto thereby to cause said follower plug to expand said tubular member, said stem 10 having a screwthreaded bore in its upper end, a temporary cover plate for said recess having a central hole through it, and an attaching screw for said cover plate extending through said hole and screwed into said bore, said cover plate being imperforate except for said central bore. 15

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