Aug. 11, 1959 W. S. REIER 2,899,099

ADJUSTABLE BUT LOCKED-ON TEMPORARY CAP FOR PIPE

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Fig-3



Fig-1

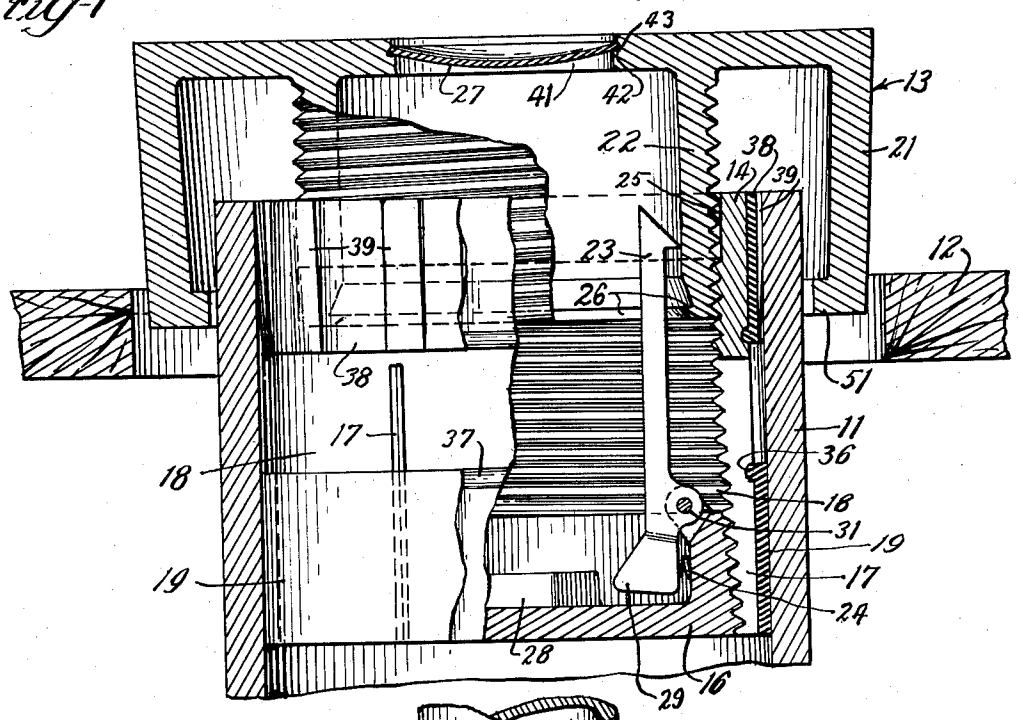
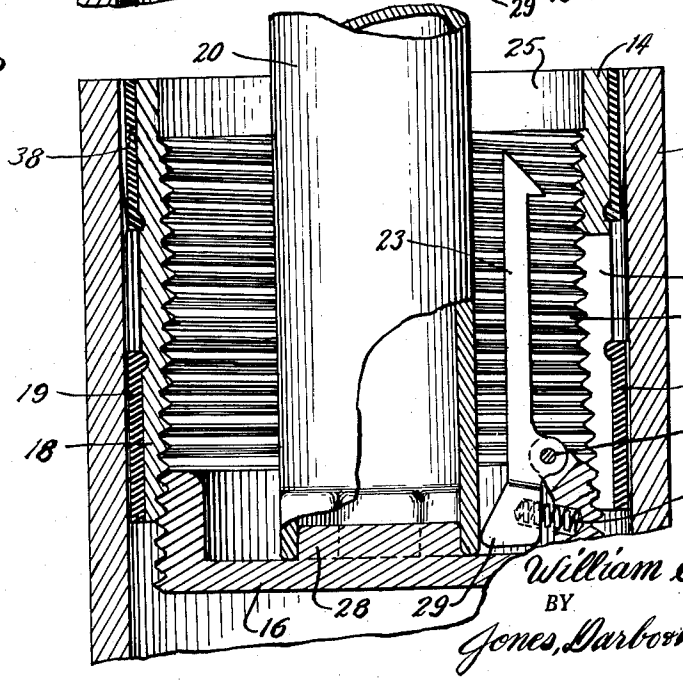


Fig-2



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ADJUSTABLE BUT LOCKED-ON TEMPORARY CAP FOR PIPE

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10 Claims. (Cl. 220—24.5)

When cement work is to be done on the floor of a room having a pipe coming up through the floor, but which is to terminate at or near floor level, it is desirable to provide a temporary cap over the pipe, and many such devices have been tried in the past. Generally speaking, they have only partially satisfied the need.

A typical problem is in connection with the tiling of a bathroom floor. Eventually, one surface of the top flange portion of the fitting called a closet flange is to be flush with the top of the tile floor. The plumber installs the soil pipe before the concrete for the tile floor is laid. Some of them wait until after the floor is finished and hardened before applying the closet flange to the soil pipe, so as to be sure to get it at just the right position with respect to the floor. If the plumber merely leaves the flanges loosely set around the soil pipe at approximately the right level, perhaps stuffing the soil pipe with rags, a cement worker is likely to remove the flange. Then the plumber will have to spend much time chipping the concrete away around the soil pipe in order to make room for the installation of the flange. Furthermore, even if the flange is left in place, it is likely to be either a little too high or a little too low. If it is too low, it is likely to become more or less buried and he will have trouble finding it, or at least will have to spend time cleaning it. This is wasteful. If it is too high, it is in the way of the leveling operations of the cement worker. Temporary caps which might seem obvious are subject to the same difficulty as to height. If they are too high, they are in the way of the tile setter or cement men, some of whom will simply remove the cap so that chipping away will be needed (and probably drop cement in the soil pipe). If the temporary cap is too low, it gets buried and is hard to find.

According to the present invention the difficulty is solved by providing a temporary cap which is not readily removed by the cement worker or tile setter but which is readily adjustable as to height. Hence, the plumber can set it high enough to be sure it is at least as high as the ultimate floor or cement level, and when the cement worker finds it in his way he will merely screw it down to the right level. Since he can use it as a leveling guide, he is not likely to screw it down too far and bury it. When the plumber returns, he is equipped with a proper tool for easily removing the temporary cap, and it leaves a recess in which he can readily install the closet flange. Because the soil pipe is unthreaded, the cap is carried by a base which clamps to the pipe, preferably by screw operated clamping means.

Additional objects and advantages of the invention will be apparent from the following description and from the drawings.

Designation of figures

Figure 1 is a vertical sectional view through an embodiment of the invention chosen for illustration, shown in conjunction with the top of a soil pipe and the subflooring for a tile floor.

Figure 2 is a similar view with some parts omitted, but showing the special wrench in place for releasing the latch and adjusting the core expander.

Figure 3 is a fragmentary view showing the insertion of the tamper resisting disc.

Although the following disclosure offered for public dissemination is detailed to ensure adequacy and aid understanding, this is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements. The claims at the end hereof are intended as the chief aid toward this purpose, as it is these that meet the requirement of pointing out the parts, improvements, or combinations in which the inventive concepts are found.

General description

The invention is illustrated in conjunction with the upper end of a soil pipe **11** upstanding over the sub-floor **12** on which concrete is to be laid, either for a concrete floor as as a base for ceramic tile. In a sense, the heart of the invention is the molding or recessing cap **13**. In another sense, the heart of the invention is in the assembly by which this cap **13** is locked on but adjustably positioned.

This is accomplished by a base which forms or includes an expanding core **14**, expanded by a tapered plug or core expander **16**. The expanding core **14** is internally threaded, and the plug **16** engages the lower part of the expanding core **14** with a wedging action. Either the core expander **16** may be of upwardly decreasing diameter, the bottom portion of the core **14** may be of upwardly decreasing internal diameter, or both.

The core **14** is provided with a plurality of slots **17** extending upwardly from its bottom. The slots **17** divide the lower portion of the expanding core **14** into downwardly extending arcuate fingers **18**. Friction padding **19** is carried on the outside of the fingers **18** to engage the inside of the soil pipe **11** as shown in Fig. 1.

When the core expander **16** is screwed up to the position shown in Fig. 1, or higher if necessary, padding **19** firmly grips the inside surface of soil pipe **11**.

The cap **13** is provided with a skirt or molding flange **21** which extends down around the outside of the soil pipe **11**. The flange or skirt **21** is of the proper size so that when later it is removed from the hardened concrete surrounding it, there will be room for the desired fitting such as a conventional water closet flange to be set in place. The cap **13** is also provided with a second smaller skirt or sleeve **22** which is externally threaded to engage threads on the inside of core **14**, so that the height of the cap **13** may be adjusted by screwing it up or down. Preferably suitable means is provided for preventing unauthorized removal of the cap **13**. It is preferred that this be a releaseable latch, such as the latch **23**. In the illustrated form this latch is urged by spring **24** toward a position in which it will engage an annular shoulder **26** just after the cap **13** has been screwed upwardly far enough to cause disengagement of the threads from one another. Latch **23** will thus prevent lifting the cap **13** off, and can not be forced or broken by screwing the cap further out. Preferably an unthreaded overlap portion **25** is provided to keep the parts centered at this time.

Access to the latch **23** is normally prevented by some tamper-discouraging device such as snap disc **27**, which will not be readily removed by the uninformed. The cap **13** can be applied with disc **27** in place, because latch **23** is cam-shaped to ride over the shoulder **26** as the cap is being applied.

When the tile floor has been laid and the plumber returns to install the flange, he will remove the plate **27**. He can then release the latch **23** and remove the cap **13**.

Either before or after removing the cap **13** he may insert a tubular socket wrench **20**, which engages a head **28** formed on the upper surface of plug **16** to screw the plug down so that the padding **19** will no longer grip the soil pipe **11**. Preferably the wrench **20** also serves to release the latch **23**, as by engaging a dog **29** beyond the pivoting spindle **31** from the latching end of latch **23**.

Further details

Although one skilled in the art would be able to construct from the drawings and from the foregoing description a device embodying the principles described, along either the lines of the illustrated form or some different form, a further description of the illustrated form may be helpful.

Conveniently, the padding **19** may be in the form of a rubber sleeve or band elastically stretched around the core **14**. It may be held in place by cement or by interengaging formations. For example, a small annular bead **36** may be formed on the inside of the sleeve **19** and may fit within an annular groove **37** formed on the outside of the core **14**.

A somewhat similar sleeve or band **38** is provided around the top of the core **14**, but this band does not firmly engage the inside of the soil pipe **11**. This band **38** serves as a centering guide and it may have an external diameter (when in place) small enough to fit smoothly within even the internally-smallest of the soil pipes of the nominal size for which it is designed. To provide enough tolerance for commercial variations in the soil pipes, this means that it will fit a little loosely in some pipes. This effect can be minimized by providing the band **38** with ribs **39**, the rubber in band **38** and ribs **39** being soft enough so that these ribs are easily compressed to accommodate the variations in internal diameters of the soil pipes.

The fingers or segments **18** preferably have a "set" such that in their normal position, with the expander **16** screwed down at least as far as shown in Fig. 2, the band or padding **19** will not grip against the soil pipe **11**. The slots **17** are of such length and number (perhaps more than shown), and the material of the core **14** of such nature, that the fingers or segments **18** may be expanded resiliently far enough to grip the inside surface of the soil pipe **11** firmly even with the largest size variations from the nominal size.

In the illustrated form, the tamper-discouraging plate or disc **27** changes its maximum diameter when snapped from the Fig. 3 condition to the Fig. 1 condition. Thus with accurate machining of the parts, the plate **27**, in the Fig. 3 condition barely has clearance to be dropped into place as seen in Fig. 3. Here it comes to rest on annular shoulder **42**. By pressing the center of snap disc **27** further downwardly, it will snap to the condition shown in Fig. 1, in which its diameter is now large enough to prevent upward removal of the plate **27** until it has again been snapped to the condition shown in Fig. 3. If the bore through which disc **27** is dropped is undercut above shoulder **42** as at **43** disc **27** interlocks with the undercut. Without the undercut, the interlock is one of elastic deformation. The plumber may remove this disc in either of two ways. If it is provided with a small center hole, or if he drills one in it, he can insert a hook and resnap disc **27** to the Fig. 3 condition after which it will lift right out. The plumber can also drive the disc **27** downwardly, destroying it if necessary. If the shoulder **42** is quite narrow, the disc **27** may be reuseable even though driven downwardly.

It will be observed that the skirt **21** is tapered, with a downward reduction in external diameter. This is to facilitate removal after the concrete surrounding it has hardened. The outer surface should be accurately concentric with the threads on skirt **22**, and should be smoothed or even polished. If a mold release compound is applied, the cap can be turned after hardening of the concrete. The release compound should be one suitable for Portland cement, and may be plain petrolatum. If found desirable, a paper sleeve can be wrapped around skirt **21** for each installation. Alternatively, the skirt **21** could be separable or a temporary skirt applied in its place at each installation. If the skirt is thin and of low cost it may conceivably be allowed to remain in position permanently. In that event, its inside dimensions should be such as to receive the desired fitting such as a closet flange.

The skirt **21**, or any temporary skirt which replaces it, should have a reasonably close fit with the outside wall of soil pipe **11**. Internal flange **51** has been illustrated having a slight clearance around the soil pipe **11**. If it is found that under some conditions cement wells up into this clearance, the flange **51** could be capped with an annular soft rubber grommet sealing against the outer surface of soil pipe **11**.

I claim:

1. A temporary cover for a pipe including a base including screw operative clamping means for clamping it to the pipe, a cap threaded to the base for adjustment axially of the pipe, said cap surrounding the end of the pipe and having an outer contour adapted, when removed from concrete poured around it, to leave a recess adapted to receive a fitting for the pipe, limiting means protected by the cap for preventing removal of the cap, and tamper-discouraging means for access through the cap to release said limiting means.

2. A temporary cap according to the preceding claim characterized by an expandable core forming part of the base, a core expander threaded in said core and having on its outwardly exposed face formations adapted for engagement with a special wrench but not ordinary tools, the access means of the cap being adapted to permit the passage of said wrench through the cap.

3. A temporary cover for a pipe including a base including clamping means for clamping it to the pipe, a cap threaded to the base for adjustment axially of the pipe, said cap surrounding the end of the pipe and having an outer contour adapted, when removed from concrete poured around it, to leave a recess adapted to receive a fitting for the pipe, limiting means protected by the cap for preventing removal of the cap, and tamper-discouraging means for access through the cap to release said limiting means.

4. A temporary cover for a pipe including a base including clamping means for clamping it to the pipe, a cap carried by the base for adjustment axially of the pipe, said cap surrounding the end of the pipe and having an outer contour adapted, when removed from concrete poured around it, to leave a recess adapted to receive a fitting for the pipe, limiting means protected by the cap for preventing removal of the cap, and tamper-discouraging means for access through the cap to release said limiting means.

5. A temporary cover for a pipe including a base including clamping means for clamping it to the pipe, a cap carried by the base for adjustment axially of the pipe, said cap surrounding the end of the pipe, and adapted to provide a recess in concrete laid around the pipe to receive a fitting for the pipe, limiting means protected by the cap for preventing removal of the cap, and tamper-discouraging means for access through the cap to release said limiting means.

6. A temporary cover for a pipe including a base including clamping means for clamping it to a pipe, a cap carried by the base and adjustably connected to the base for adjustment with respect to the clamped base and with respect to the pipe; said cap telescopically surrounding the end of the pipe and shielding the end of the pipe through a substantial range of adjustment, and adapted to provide a recess in concrete laid around the pipe to receive a fitting for the pipe; and said cap having an opening therethrough, and a tamper-discouraging closure

for the opening, for affording access through the cap to facilitate removal of the temporary cover from the pipe; said temporary cover including means limiting the movement of the cap and substantially preventing removal of the clamping means without said access.

7. A temporary cover for a pipe including a base including clamping means for clamping it to a pipe, a cap carried by the base and adjustably connected to the base for adjustment with respect to the clamped base and with respect to the pipe; said cap telescopically surrounding the end of the pipe and shielding the end of the pipe through a substantial range of adjustment, and adapted to provide a recess in concrete laid around the pipe to receive a fitting for the pipe; said temporary cover including means tending to limit the movement of the cap, to prevent its removal, and to prevent unauthorized access to the clamping means of the base; and said temporary cover also including means, readily operated by an authorized person for making the last named means ineffective.

8. A temporary cover for a pipe, according to claim 7, in which the clamping means includes an expandable core for gripping the inside of the pipe.

9. A temporary cover for a pipe including a base including screw-operated clamping means for clamping it to a pipe, a cap carried by the base and adjustably connected to the base for adjustment with respect to the clamped base and with respect to the pipe; said cap telescopically surrounding the end of the pipe and shielding the end of the pipe through a substantial range of adjustment, and adapted to provide a recess in concrete laid around the pipe to receive a fitting for the pipe; said temporary cover including means normally made inaccessible by the cap tending to limit the movement of

the cap with respect to the base, to prevent its removal, and to prevent unauthorized access to the clamping means of the base; and said temporary cover also including means affording access to a person equipped with a special tool, unlikely to be possessed by an unauthorized person, for unscrewing the clamping means.

10. A temporary cover for a pipe including a base including screw-operated clamping means, having an operating element, for clamping it to a pipe by expansion against the inside of the pipe, a cap carried by the base and adjustably connected to the base for adjustment with respect to the clamped base and with respect to the pipe; said cap telescopically surrounding the end of the pipe and shielding the end of the pipe through a substantial range of adjustment, and adapted to provide a recess in concrete laid around the pipe to receive a fitting for the pipe; said temporary cover including means normally made inaccessible by the cap tending to limit the movement of the cap with respect to the base, to prevent its removal, said cap having an aperture fitted with a press-out closure, and said clamping means being constructed with its operating element normally concealed by the cap and substantially spaced beyond said aperture to be relatively inaccessible without a tool capable of reaching through the aperture and engaging said operating element.

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