July 30, 1957 A. A. BAKER ET AL 2,801,023

CLOSURE UNIT

Filed March 4, 1954

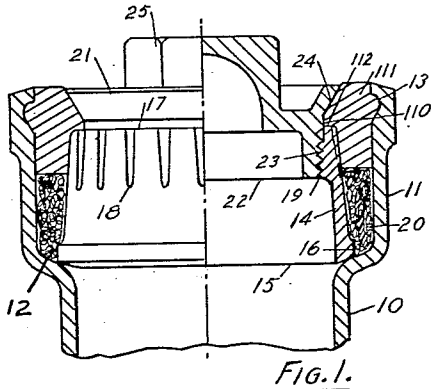



FIG. 1.

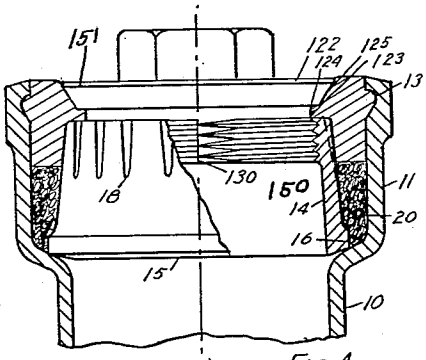



FIG. 4.

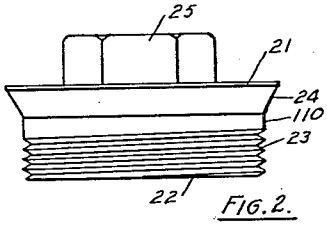



FIG. 2.

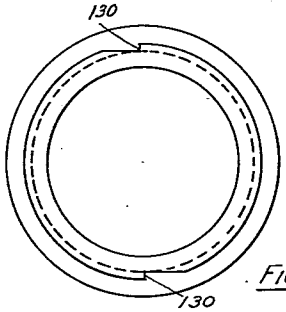



FIG. 5.

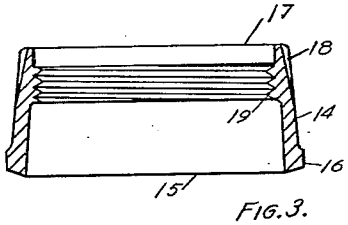



FIG. 3.

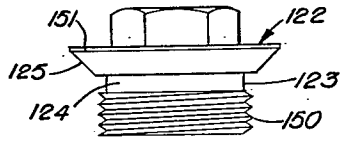



FIG. 6

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# CLOSURE UNIT

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1 Claim. (Cl. 220—39)

This invention relates to closures for pipes and constitutes an improvement over Patent No. 1,911,455 which was assigned to the assignee of this application.

The closure shown in the patent and other closures for pipes with which we are familiar do not provide for wear on the lead seat due to the removal and replacement of the plug. Therefore, after the plug of the conventional closure has been removed a few times, a leak is likely to arise between the lead seat and the plug.

In the present invention, the plug is provided with a cylindrical portion between the tapered seat and the threaded portion of the plug. The cylindrical portion enters the counterbore at the top of the closure as the plug is screwed down even with the top of the drainage hub. At the time the cylindrical portion has entered the counterbore, it provides a cut-off and prevents caulking material from entering the threads. At the same time, an extension above the sleeve is provided so that ample lead is present for reseating the plug when the plug becomes worn by repeated removal and replacement thereof. As an alternative, we provide a plug with an undercut portion which extends to the depth of the threads and prevents the caulking lead from flowing into the root of the thread, providing a flat seat as well as a tapered seat. In this embodiment, the thread must cut its own way through the lead as it is screwed out. In order to accomplish this, a sharp edge is provided to more readily cut through the threaded lead portion.

Specifically, it is an object of our invention to provide a plug for a drainage pipe which will reseat itself after repeated removals.

Another object of our invention is to provide a novel structure in a drainage plug wherein the plug will reseat itself after repeated removals.

A further object of our invention is to provide a plug for a drainage pipe which is simple in construction, economical to manufacture, and simple in application.

With the above and other objects in view, the present invention consists of the combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawing and more particularly pointed out in the appended claim, it being understood that changes may be made in the form, size, proportions, and minor details of construction without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

Fig. 1 is a view of a novel plug inserted in a pipe according to our invention;

Fig. 2 is a view of the plug shown in Fig. 1;

Fig. 3 is a view of the ferrule used in Fig. 1;

Fig. 4 is a transverse cross sectional view of another embodiment of the invention;

Fig. 5 is a top view of the embodiment shown in Fig. 4; and

Fig. 6 is a side view of the plug shown in the embodiment of the invention in Fig. 4.



Referring now more particularly to the drawing, in Fig. 1, we show a pipe **10** having an enlarged end **11** forming an internal shoulder **12**. The end **11** is formed adjacent its extremity with an annular groove **13**.

A cylindrical ferrule **14** is provided having an external diameter substantially less than the internal diameter of the pipe end **11** and a lower end **15** is adapted to rest on the shoulder **12**. The end **15** is formed with an external shoulder **16** and the opposite end **17** of the ferrule **14** is externally formed with a plurality of longitudinally extending grooves **18** and is internally threaded at **19**. In order to retain the ferrule **14** in the pipe end **11**, the space between the ferrule **14** and the wall of the pipe end **11** is tightly packed with oakum or similar packing material indicated at **20** with lead **111** overlying the oakum. The oakum **20** overlies the shoulder **16** as shown in Fig. 1. It is apparent that lead could be substituted for the oakum **20**.

A closure plug **21** has an inner end **22** which is threaded at **23** for engagement with the threads **19** on the ferrule **14** and passes through lead **111**. The plug **21** is formed with a flared surface **24** adapted to be disposed outwardly of the ferrule **14** and flared from its inner end to its outer end at a substantial angle to the ferrule axis. The angle should be approximately twenty-five to fifty degrees. The plug **21** is formed with a polygonal shaped head **25** for engagement by a wrench.

The plug **21** has a cylindrical portion **110** which extends outwardly flush with or slightly beyond the tips of the threads **23** and forms a seal with the lead **111** which projects at **112** over the upper edge of the ferrule **14**. Therefore, it will be seen that when the plug **21** is removed, the threads **23** will slide past the overlying portion **112** of the lead **111**, thereby making it easy to remove the plug **21** and also allowing the plug to be tightened an additional amount to compensate for wear on the lead **111**. By the pressure of the flared surface **24** on the lead **111**, it is forced down into engagement with the surface **112** and into sealing engagement with the cylindrical surface **110** when the plug is tightened.

During assembly of the closure for the pipe end **11**, the ferrule **14** is placed in the position indicated and the oakum **20** is forced into place and, thereafter, the plug **21** is threaded into the opening **17** of the ferrule **14**. Lead **111** or other similar material is flowed into the space above the oakum and caulked therein and forced into the groove **18** and into the groove **13** and molded against the flared surface **24** and against the surface **110** of the plug **21** to form a gas and water tight seal equivalent to a ground joint formed by a taper on the plug **21** and the lead socket. The grooves **18** on the ferrule **14** prevent turning or loosening of the ferrule in the lead **111**. Thus, when the caulking material hardens, the tongues extending into the groove **13** will effectively hold the ferrule **14** against removal from the pipe end **11** and the tongues extending into the groove **18** will effectively prevent rotation of the ferrule **14** with respect to the pipe **10** and the surface **24** coacting with the lead **11** will have all the advantages of a ground seat. Furthermore, the plug **21** can be repeatedly removed and reinserted, maintaining the gas and water tight seal due to the cylindrical portion **110** forming a path for the threads **23** to be removed.

In the embodiment of the invention shown in Figs. 4 and 5, we show an alternate construction of our invention having a similar function. The plug **122** is provided with an undercut at **123** which extends to the depth of the thread **150**, permitting the caulking lead to flow into the root of the thread **150** and providing a flat surface at **124** as well as a tapered seat **125**. Since the plug **122** must cut its own thread through the lead as it is screwed out in removing it, a sharp cutting edge

130 is provided on the side of the cap 151 in order to make the threads 150 cut their way through the lead 111.

In the foregoing specification, we have set forth the invention in its preferred practical forms but we are aware that the structure shown is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claim.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

We claim:

A closure structure for a pipe having an enlarged end with a cylindrical internal surface, said cylindrical surface terminating at the inner end in an internal shoulder, an internal circumferential groove adjacent the outer end of said cylindrical surface, a ferrule having a substantially cylindrical internal surface and having an outer surface tapering outwardly and toward the center thereof and disposed in said enlarged end of said pipe, said ferrule being internally threaded and having an external diameter substantially less than the inside diameter of said pipe end, the lower end of said ferrule resting on said internal shoulder, said ferrule having axially extending grooves in the outer periphery thereof, said grooves terminating at the end thereof remote from said shoulder engaging end, the space between the outside periphery of said ferrule and the internal wall of said pipe adjacent the end of said pipe being packed with metallic sealing material, a closure plug having the inner end thereof threaded and threadably engaging said internal threads of said ferrule, a portion of said plug adjacent said threaded end having a reduced size cylindrical portion substantially less in diameter than said threaded portion, the outer portion of said plug adjacent said reduced size portion being flared outwardly from said cylindrical portion, said flared portion engaging said metallic sealing material in said pipe forcing said sealing material into said internal peripheral groove in said pipe and into said reduced size cylindrical portion and into said ferrule grooves, and an axially extending notch cut into the threaded portion of said plug and extending longitudinally therein, said notch having one edge thereof forming a sharp radially extending edge whereby said closure threads will cut their way outwardly through said metallic sealing material disposed around said closure when said plug is rotated in a direction to remove same from said ferrule.



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