Dec. 22, 1931. D. W. THOMAS 1,837,345

CLOSURE FOR CYLINDRICAL MEMBERS

Filed Aug. 6, 1930

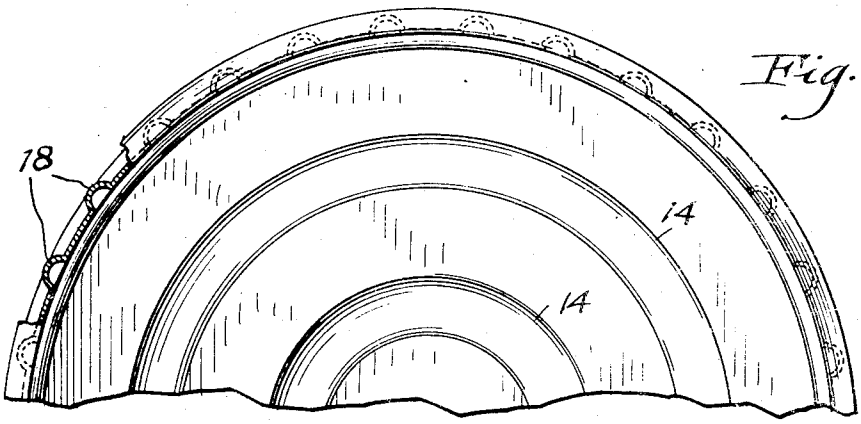


Fig. 5.

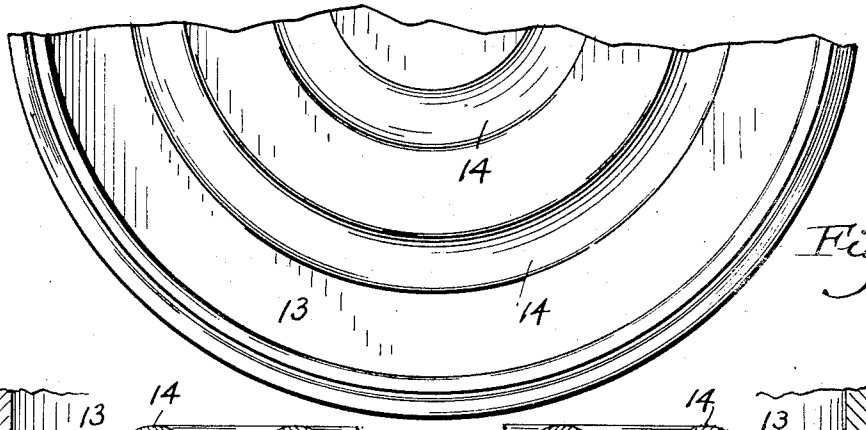


Fig. 3.

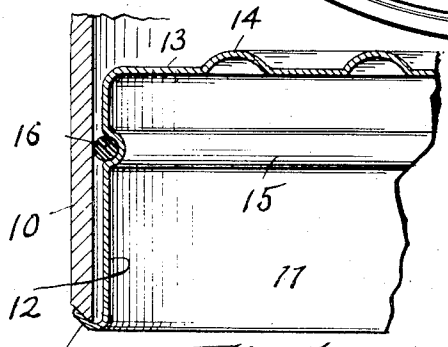


Fig. 1.

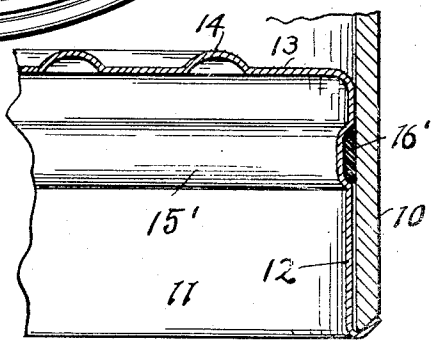


Fig. 2.

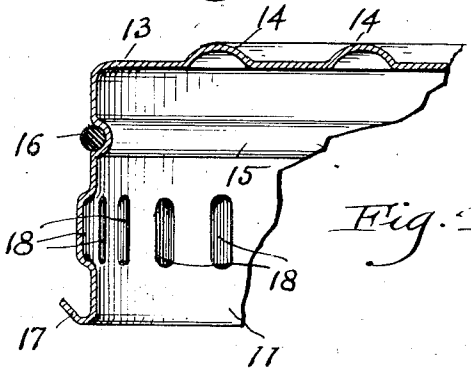


Fig. 4.

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1,837,345

UNITED STATES PATENT OFFICE

DAVID W. THOMAS, OF YOUNGSTOWN, OHIO, ASSIGNOR TO THE NILES STEEL PRODUCTS COMPANY, OF NILES, OHIO, A CORPORATION OF OHIO

CLOSURE FOR CYLINDRICAL MEMBERS

Application filed August 6, 1930. Serial No. 473,504.

This invention relates to improvements in closures for cylindrical members. It finds particular utility as a closure for the ends of heavy gauge steel pipe, that is as a means for excluding dirt and moisture from sections of such pipe after they have been cleaned at the factory and up until the time they are laid. Such protection is of particular importance where the pipe is designed for use in gasoline pipe lines. However the invention is adapted for use upon cylindrical members of various kinds aside from pipe.

One of the objects of the invention is the provision of a closure which may be securely attached to the cylindrical member and sealed with respect thereto, and preferably one where both of these results may be obtained by a single manipulation.

Another object is the provision of a closure consisting entirely of a single piece of sheet metal and one gasket, thereby insuring a low cost product.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which

Figure 1 is a fragmental, radial sectional view of the preferred form of closure applied to a pipe section but not attached or sealed thereto.

Fig. 2 is a similar view subsequent to the attaching and sealing operation.

Fig. 3 is a bottom plan view of the closure of Fig. 1.

Fig. 4 is a view similar to Fig. 1, showing a modification of the invention, and

Fig. 5 is a bottom plan view of the closure illustrated in Fig. 4, certain parts being broken away and others shown in section in order to more clearly illustrate the invention.

In the drawings there is shown at 10 a fragment of a steel pipe having a beveled end, these pipe sections being adapted to be united by welding so as to form a liquid-tight joint. The closure member, according to the preferred form shown in Figs. 1, 2 and 3, consists of a cup member 11 having a substantially cylindrical side wall 12 and a bottom wall 13 in which may be formed one or more circular corrugations 14 for reenforcement purposes. These corrugations are produced by depressing circular ribs out of the bottom wall 13 in order that the corrugations may not interfere to even the slightest extent with the use of special tools employed in setting the closures. In the side wall 12 a short distance from the bottom wall 13 I form an annular corrugation 15 providing a circular groove facing outward. In this groove I mount a ring gasket 16, preferably a soft rubber ring of circular cross section. The parts are so proportioned that the cup 11 with the gasket 16 in place thereupon may be slipped into the end of the pipe 10 without the use of tools. Its inward movement will be stopped by a flange 17 which extends outwardly from the rim of the cup and is adapted to engage the beveled end surface of the pipe. Thereupon the operator inserts into the cup an expanding tool of any suitable design adapted to flatten and force outwardly the corrugation 15 into somewhat the shape illustrated in Fig. 2 at 15′, the consequently flattened gasket being shown in the same figure at 16′. The degree of pressure applied in this expanding operation may be varied to suit different conditions, but as a rule I propose to make it large enough to expand the side wall of the cup member on one or both sides of the gasket far enough to cause such surfaces on the cup member to engage tightly the inner wall of the pipe section above or below the gasket, or both above and below the gasket. The frictional contact between the gasket and the pipe wall of course tends to attach the closure to the pipe, but this attachment may be made very secure indeed by continuing the expansion sufficiently to cause a tight metal to metal contact.

The modification of Figs. 4 and 5 is similar in every respect to that above described, except that I add a series of outwardly pressed bosses 18, the outer edges of which are arranged in a circle of a diameter very little greater than the internal diameter of the pipe. When the closure is to be set, it is driven into the pipe by any suitable means,

thereby compressing the bosses 18, until the flange 17 engages the end of the pipe. The friction between the deformed bosses 18 and the inner wall of the pipe secures the closure firmly in place. A comparatively light pressure applied to expand the corrugation 15 will then press the gasket 16 against the pipe wall sufficiently to effect a good seal.

In the field, when it becomes necessary to remove a closure, a tool will generally be driven through the center of the bottom wall of the closure and then rotated through a portion of a revolution, or otherwise caused to engage under the metal of the bottom wall of the closure, after which a strong pull will be exerted upon the tool to draw the closure out of the end of the pipe. It will be noted that the closure extends well into the pipe, and offers no obstruction to the use of grappling hooks for handling the pipe.

While in the foregoing description and in the accompanying drawings I have disclosed more or less in detail one particular embodiment of the invention, I desire it to be understood that such detail disclosure has been resorted to primarily for the purpose of fully illustrating the invention in accordance with the requirements of the statute, and that it is not to be construed as amounting to any limitation upon the scope of the invention.

Having thus described my invention, I claim:

1. A closure for a cylindrical member, comprising a sheet metal cup having a series of outwardly extending bosses positioned at intervals around the side wall thereof, said bosses being adapted to tightly engage the inner wall of the cylindrical member when the cup is driven thereinto, and an annular gasket supported by the side wall inwardly of said bosses adapted to engage the inner wall of the cylindrical member for sealing the closure.

2. A closure for a cylindrical member, comprising a sheet metal cup having a series of outwardly extending bosses positioned at intervals around the side walls thereof, said bosses being adapted to tightly engage the inner wall of the cylindrical member when the cup is driven thereinto, a flange on the rim of the cup adapted to engage the end of the cylindrical member, and a gasket carried upon the outer side of said cup adapted to form a seal between the cup and the cylindrical member.

3. In combination with a cylindrical member, a closure therefor comprising a sheet metal cup fitted into the end of the cylindrical member, said cup having an annular groove in its outer wall, and a rubber gasket mounted in said groove, the metal behind said groove being expanded outwardly, whereby the gasket is compressed to seal the closure, and the metal of the cup adjacent the groove being likewise expanded to grip the wall of the cylindrical member.

4. In combination with a cylindrical member, a closure therefor comprising a sheet metal cup fitted into the end of the cylindrical member, said cup having a circular corrugation in its side wall, a gasket mounted therein, said corrugation being expanded outwardly, whereby the gasket seals the joint between the cylindrical member and cup, the metal of the cup wall adjacent to said corrugation being likewise expanded to tightly grip the interior wall of the cylindrical member.

In testimony whereof, I hereunto affix my signature.

DAVID W. THOMAS.

DISCLAIMER

1,837,345.—*David W. Thomas*, Youngstown, Ohio. CLOSURE FOR CYLINDRICAL MEMBERS. Patent dated December 22, 1931. Disclaimer filed January 2, 1936, by the assignee, *The Niles Steel Products Company*.

Hereby enters this disclaimer to claims 3 and 4 of said Letters Patent.

[*Official Gazette February 4, 1936.*]