

R. S. GLADDING.
FERRULE.

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933,750.

Patented Sept. 14, 1909.

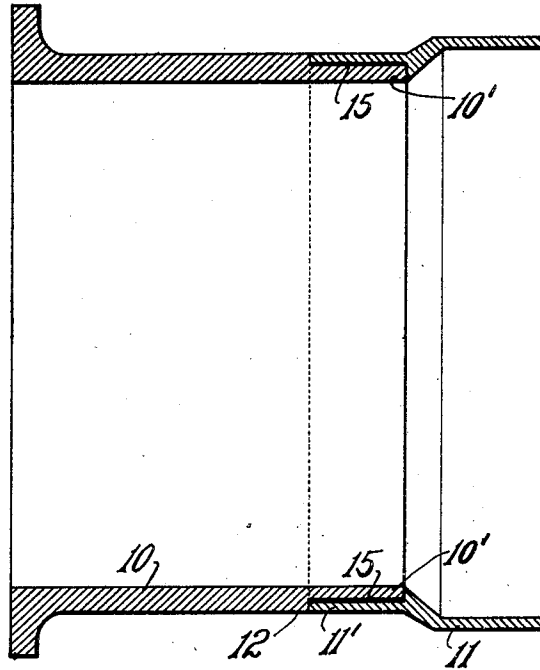


FIG. 1.

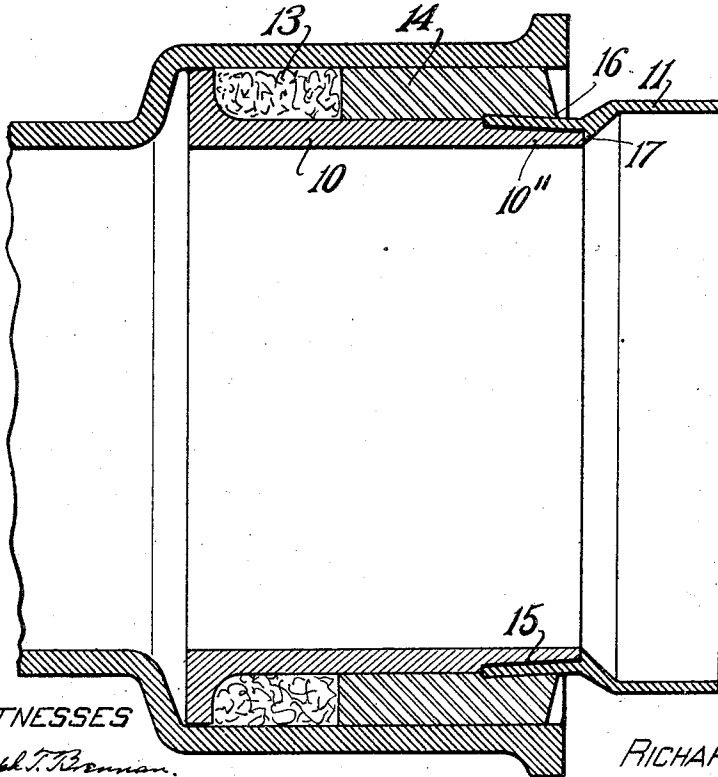


FIG. 2.

WITNESSES

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RICHARD SMITH GLADDING, OF BEVERLY, MASSACHUSETTS.

FERRULE.

932,750.

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To all whom it may concern:

Be it known that I, RICHARD S. GLADDING, a citizen of the United States, residing at 32 Butman street, Beverly, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Ferrules, of which the following is a specification.

This invention relates to ferrules.

More particularly it relates to ferrules used by plumbers in effecting a junction between lead pipe and iron pipe. It is not possible to join ordinary lead and iron pipe effectively together. The lead cannot be soldered to the iron. If an attempt be made to join it by a mechanical engagement of some sort, the lead is found to have insufficient strength; and if cast around the iron the lead shrinks away from the iron and does not make a tight joint. Consequently brass ferrules have hitherto been used. One end of the ferrule can be soldered to the lead and the other end can be calked into the iron. Such ferrules have hitherto been made of a solid piece of brass. The purpose of the present invention is to make a less expensive ferrule having all the advantages of a solid brass one. This is accomplished in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation in section representing a completed ferrule embodying the invention, Fig. 2 is a similar view of another embodiment of the invention, showing it in use.

The ferrule represented in the drawing is composed of an iron piece 10, and a brass piece 11, fitted together and forming what is practically one integral piece, having all the useful attributes of a solid brass ferrule. The end of the iron portion remote from the brass may be shaped as has hitherto been customary in brass ferrules or in any desired manner. The end of the brass portion that is remote from the iron may likewise be shaped in any desired way. The end of the iron portion 10' which is next to the brass is an annular lip shaped to conform to and to overlap the adjacent end or lip 11' of the brass. In making the ferrule, preferably the external diameter of the iron at the lip is less than elsewhere, and is a trifle larger than the internal diameter of the brass lip. The external diameter of the brass lip is substantially the same as the ex-

ternal diameter of the main body of the iron, as at 12. The parts are assembled by heating the brass, thereby expanding it; placing it with its lip upon and surrounding the iron lip; and allowing it to cool. Upon cooling it shrinks upon and grips the iron tightly. Preferably the iron is coated with tar or with any suitable iron cement before the brass is placed upon it. The proximity of the hot brass upon this coated surface converts the tar or cement into a liquid or pasty condition. As the brass shrinks this seeks and fills all irregularities of fit and all minute spaces between the iron and brass; and solidifies when cool, forming a packing which prevents all leakage. This is represented in the drawing by the thickened line 15. The brass is thus strongly united to the iron, the iron being under compression and tending to expand, and the brass being under tension and tending to contract upon the iron. Both because of this mechanical union, and also because of the packing between, the joint is tight.

On the brass portion of the ferrule an annular shoulder is provided at 17 which has an abrupt face adapted to rest against the circular end of the iron lip 10', and a sloping back running to whatever diameter may be desired for the outer end of the brass. This shoulder assists in assembling the parts accurately; and after they are assembled it provides a smooth or unobstructed interior which is free from any tendency to stop material flowing through the pipe. In assembling the parts the iron portion may be put, with its axis vertical, on a level bench, and the heated brass portion placed upon it; and the parts then allowed to cool in this position. The brass resting upon its shoulder 17, thus assumes a correct position with respect to the iron, with its axis parallel to that of the iron; so that as it cools the two surfaces, brass and iron, come tightly and uniformly together; and when they have thus come together the continued contraction draws the shoulder tight against the end of the iron and assists in maintaining the joint tight and mechanically firm.

When in use, the iron end of the ferrule is to be inserted in the hub of the cast iron pipe in the ordinary manner. Oakum or other material is filled in the annular space surrounding the iron portion of the ferrule, and then molten lead is poured in

and is calked outward against the hub and inward against the ferrule.

If additional protection against leakage be required, the ferrule may be arranged as shown in Fig. 2; in which the lead which is calked between the hub and the ferrule lies partly opposite iron and partly opposite brass of the ferrule. In this arrangement the point 16, where the lead is calked with a tool, is outside of the joint between the iron and the brass. Still a further feature is shown in Fig. 2, where the annular lip of iron is formed with a slight taper, marked 10". The lip of brass which is to surround it is formed straight, its thickness being a little greater than the depth of external recess provided for it on the iron. When the brass shrinks upon the iron it assumes a tapering shape corresponding to that of the iron with a projecting annular corner of brass at its end resulting from the taper. This is illustrated in Fig. 2, in which the angles are somewhat exaggerated in order to be more clearly visible. When the lead 14 is poured between the ferrule and the hub, it will be held immovable with respect to the brass and iron of the ferrule as by a dove-tail joint, because of the said projecting annular corner which is embedded in the calking lead. This furnishes a further fastening which makes the joint tight under all circumstances. The fact that the iron lip underlies the brass lip, and sustains it during the calking operation is another point of importance, as in ferrules wholly of brass there is always danger of the calking tool being driven through the frail shell and causing a leak. The stiff iron support of the invention prevents this. If preferred iron and brass concentric lips may be assembled by pressing them together endwise, causing one to expand as if the other is pressed into it; and other variations from the precise form and manner of manufac-

ture here described may be made without departing from the scope of the patent.

I claim:

1. A ferrule composed of brass and iron pieces having overlapping annular lips, one shrunk upon the other.

2. A ferrule composed of brass and iron pieces, having overlapping annular lips, one shrunk upon the other; there being a packing material between them.

3. A ferrule composed of brass and iron pieces, having overlapping annular lips, one shrunk upon the other; one of said lips ending in a plane perpendicular to the axis and the other having at its base an abrupt shoulder in a plane perpendicular to its axis; said shoulder and lip-end abutting together.

4. A ferrule composed of brass and iron pieces, having overlapping annular lips, one being in a state of internal tension surrounding and gripping the other.

5. A ferrule composed of brass and iron pieces having overlapping annular lips, one surrounding the other, there being a filling material intervening between them.

6. A ferrule composed of brass and iron pieces, having overlapping annular lips, one shrunk upon the other, the inner lip having a tapering exterior surface and the portion of outer lip which surrounds it being of uniform thickness; and there being an external shoulder at the base of the inner lip projecting slightly less than the said thickness of the outer lip; whereby the diameter of the completed ferrule at the end of the outer lip, adjacent to said shoulder, exceeds the diameter of the ferrule at adjacent places on both sides of said lip end.

Signed by me at Boston, Massachusetts this twenty-ninth day of March, 1909.

RICHARD SMITH GLADDING.

Witnesses:

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JOSEPH T. BRENNAN.