(No Model.)

# W. BISHOP.

## PLUMBER'S FERRULE.

No. 368,508. Patented Aug. 16, 1887.

*Fig. 1.*

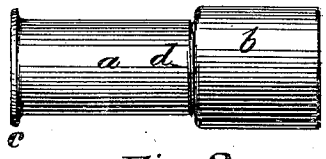



*Fig. 2.*

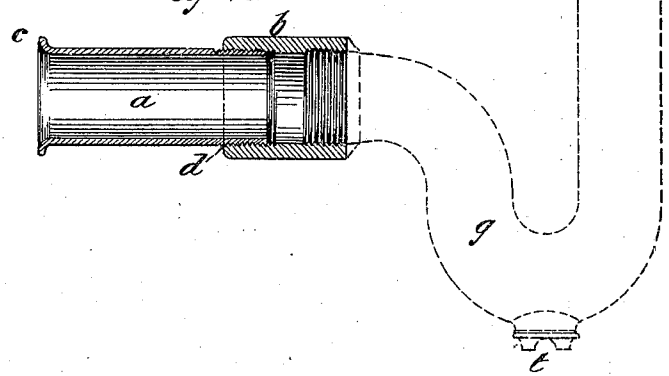



*Fig. 3.*

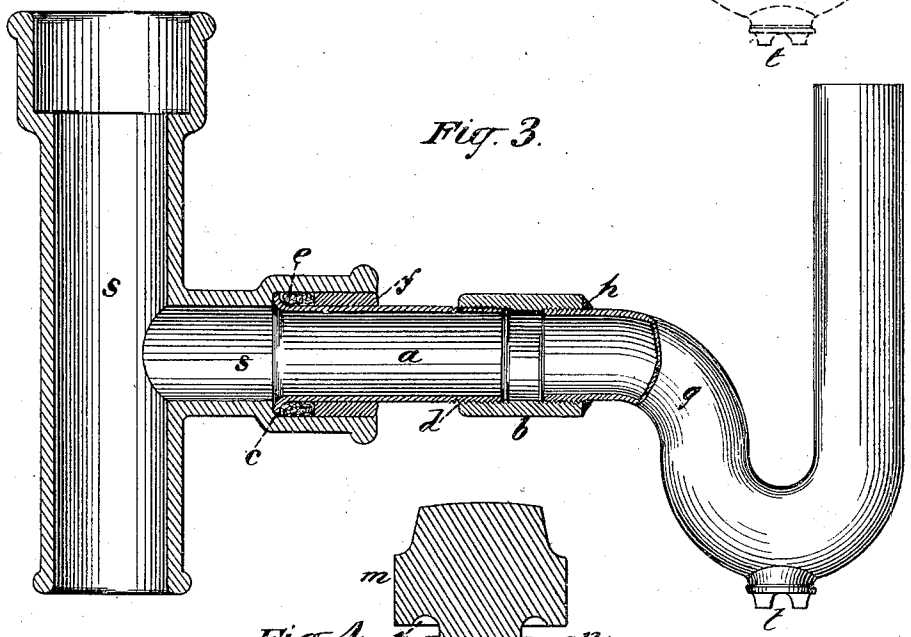
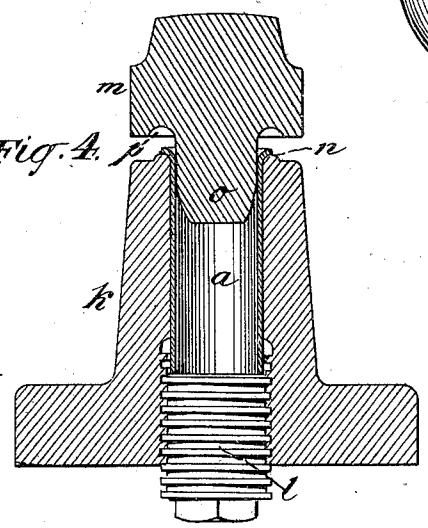



*Fig. 4.*




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# UNITED STATES PATENT OFFICE.

WILLIAM BISHOP, OF BROOKLYN, NEW YORK.

## PLUMBER'S FERRULE.

SPECIFICATION forming part of Letters Patent No. 368,508, dated August 16, 1887.

Application filed December 27, 1886. Serial No. 222,559. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BISHOP, of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Plumbers' Ferrules, of which the following is a specification.

My invention relates to those articles of plumbers' brassware known as "ferrules," for connecting lead traps or pipes with the branches of iron pipe, and which usually consist of a short tube or sleeve having an external shoulder or rim at one end adapted to be secured in the hub of the iron pipe by a calked lead joint, while the other end is soldered to the trap or lead pipe. Usually these ferrules are made of cast-brass; but they have also been made of wrought or drawn tubing, one end having the shoulder or rim cast integral or flanged or spun thereon, while the other end is tinned for direct soldering to the lead pipe or trap.

Now, I form my improved ferrule preferably of sections of wrought-metal tubing—that is, of brass or other metal tubing, either solid drawn or butt or lap welded—and I form the shoulder or rim on one end by stamping or turning out the edge of the pipe, while the opposite end I provide with a screw-thread to receive a screw-sleeve, which in turn is soldered to the lead pipe or trap. In this way I form a ferrule which is far superior in lightness and strength to the cast ferrule, and is not expensive, and at the same time is very dense in structure, impervious to gases, and not subject to flaws and leak-holes, while the connecting screw-sleeve soldered to the trap enables the trap to be at any time removed from the ferrule by unscrewing the sleeve without having to cut or tear off the trap or take out the ferrule, as would be the case with the old construction.

My invention therefore consists, mainly, in the features above outlined, as hereinafter fully set forth and claimed.

In the drawings annexed, Figure 1 gives an elevation of my improved ferrule and its connecting-sleeve, the same forming a new article of plumbers' ware. Fig. 2 is a section thereof, showing the connection of the trap by dotted lines. Fig. 3 gives a sectional view of the iron pipe and trap, with my improved ferrule connecting the two. Fig. 4 gives a sectional view of the dies used for forming the shoulder or rim on the ferrules.

Referring to Figs. 1 and 2, *a* indicates my improved ferrule, and *b* is its connecting-sleeve, which forms an auxiliary part of the ferrule. The ferrule *a* is formed of a piece or section of wrought-metal tubing of suitable length, with the edge of the pipe at one end turned over and out to form the external flange or shoulder, *c*, while on the opposite end is cut a screw-thread, *d*, of the ordinary standard taper pipe-thread, as will be understood. When the ferrule is inserted in the hub of the iron pipe *s*, as seen in Fig. 3, the rim *c* of course abuts, as usual, on the seat of the hub and engages the oakum packing *e* and the lead *f*, which is calked into the joint to secure the ferrule in the hub in the usual manner, as will be apparent from the drawings.

The screw-sleeve is threaded at one end to screw upon the threaded end of the ferrule, as shown, and the other end, which may or may not be threaded likewise, is soldered to the trap *g*, as shown at *h* in Fig. 3. I prefer to have the sleeve threaded also at its outer end, so as to screw over the trap and be soldered thereto at the same time, as indicated in Fig. 3, as this makes a better connection; but this is immaterial, as the sleeve may have a smooth tinned socket at the outer end, into which the trap may be soldered direct without screw-engagement.

It may now be seen that by this construction the ferrules may be secured in the iron pipes at any time during the erection of the building before the mason or plaster work is finished, and after due measurements are taken the screw-sleeves *b* may be soldered to all the traps at the plumber's shop, and when the building is sufficiently advanced the work may be readily finished up by screwing the sleeve, with its attached trap, upon the ferrules. This is a much more convenient manner of working than would be the direct soldering of the traps to the ferrules in the building itself, and also offers less chance of damage and loss, as the plumbing work is liable to injury if put in before the general internal work of the house is far advanced, and is also more subject to loss by theft if put in when the house is open or exposed before the carpenter-work is done. It will therefore be seen that as this form of ferrule enables a great part of the work to be prepared in advance at the plumber's shop, after which all the traps may be quickly screwed in place when the inside

work of the house is nearly completed, thus presenting important advantages, and tending to economy of labor as well as promoting safety. Furthermore, if at any time it becomes necessary to remove any trap for repairs or renewal, or for cleaning out any obstruction which cannot be removed through the usual trap-screw, *t*, this removal can be easily effected by turning the sleeve *b* with a wrench, and thus unscrewing it with the attached trap bodily from the ferrule, thereby permitting any repair, renewal, or cleansing operation in a very convenient and effective manner, after which the trap can be as easily screwed in place. On the other hand, in the old system, where the trap is soldered directly to the ferrule, it would be necessary to cut or tear off the trap from the ferrule or melt off the soldering to remove the trap, which is obviously troublesome, destructive, and expensive, and is thus quite objectionable.

The ferrule *a* may be made of brass, iron, or copper tubing, either solid-drawn tubing or butt or lap welded tubing. When made of brass, I prefer solid-drawn tubing; but brazed tube may of course be used. When made of wrought-iron, the ordinary butt or lap welded iron pipe may be used, according to the diameter of the pipe. The end flange or shoulder *c* may be formed by flaring or spinning out the edge or end of the pipe; but it is preferably performed by the stamping action of dies, as indicated in Fig. 4. In this view *k* indicates the lower or female die, having a central tubular socket to receive the section of pipe to form the ferrule, as indicated at *a*, the lower end of this pipe resting on a stout screw-plug, *l*, adjustable in the base of the tubular socket, while the upper end of the tube projects sufficiently above a semicircular bead or loop, *n*, at the top of the die to form the overturned flange. The upper or male die, *m*, has a central plunger, *o*, to enter the bore of the pipe, and a semicircular groove or recess, *p*, surrounding the root of the plunger, which corresponds to the bead *n*, and between which the edge of the pipe is stamped or turned over in a neat flaring quarter-circle flange or rim when the dies are forced together, as will be readily understood from Fig. 4.

It may now be appreciated that a ferrule made of wrought pipe with the end flanged out, as described, will be very much lighter than cast ferrules and also very much stronger. The wrought ferrule will also be more durable and less easily attacked and corroded than is the case with porous castings. My improved construction, however, enables the ferrules to be made actually much cheaper than the present brass ferrules, for by my plan the ferrule proper, *a*, need not be made of brass at all, but may just as well be made of wrought-iron pipe, whereas the screw-sleeve *b* will be made of brass, as that is the only part that requires to be soldered to the lead pipe, brass being of course desirable where soldering is done, and hence, when the main ferrule *a* is made of iron pipe and the auxiliary ferrule or sleeve *b* of brass, the complete ferrule will be actually of much less cost than those now used, and at the same time far superior in mechanical and sanitary qualities and more convenient to apply and remove, thereby presenting an important improvement in plumbers' ware.

The sleeves *b* may be made of cast-brass, but are preferably made of sections of brass tubing; but they may also be made of copper or other durable and easily-soldered metal instead of brass.

I ordinarily prefer to have a male thread on the ferrule and a female thread on the sleeve; but this may of course be reversed in some cases.

As it is new with me to construct a ferrule in two parts screwing together, the one part having the end flanged to be fixed in the iron pipe and the other part being soldered to the trap, these two parts may both be made of cast metal without departing from this feature of my invention; but the wrought tubing is of course always preferable.

What I claim is—

1. A plumber's ferrule to connect traps to iron pipe, made in two parts screwing together, one part having an end flange to be fixed in the iron pipe, the other part being adapted to be soldered at the extremity to the trap, substantially as set forth.

2. A plumber's ferrule screw-threaded on one end, in combination with the soldering-sleeve *b*, screwed thereon, substantially as shown and described.

3. In plumbing work, the combination, with the iron pipe *s* and lead pipe or trap *g*, of a ferrule, *a*, having one end flanged and secured in the iron pipe and the other end provided with a screw-thread, with the auxiliary screw ferrule or sleeve *b*, screwed at one end on said ferrule and soldered at the opposite end to said trap.

4. An improved compound ferrule formed of two parts of different metals screwed together, the inner flanged part being made of iron, while the outer connecting part is made of brass, adapted to be soldered to the trap or lead pipe, substantially as herein set forth.

5. A plumber's ferrule made of wrought-iron pipe and threaded at its outer end, in combination with the brass soldering-sleeve *b*, screwed to the same, substantially as shown and described.

6. A compound ferrule consisting of a main ferrule, *a*, formed with wrought tubing, with one end turned over to form the flange *c* and the opposite end threaded, in combination with the auxiliary ferrule or connecting-sleeve *b*, screwing thereon, substantially as and for the purpose set forth.

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