(No Model.)

F. I. LESSARD.

PIPE JOINT.

No. 424,799. Patented Apr. 1, 1890.

FIG. 1.

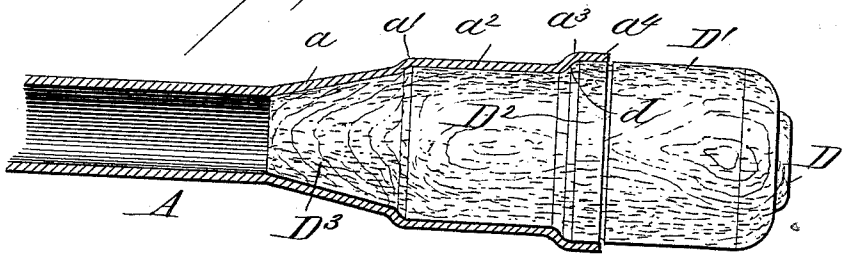


FIG. 2.

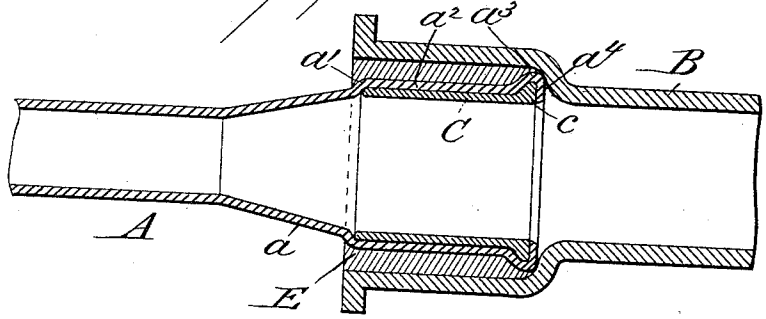


FIG. 3.

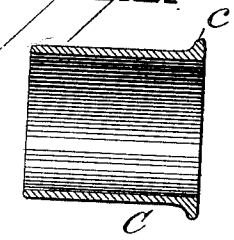
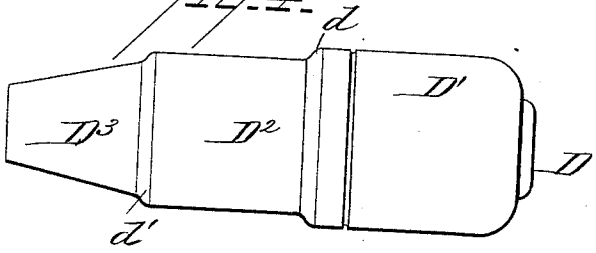


FIG. 4.



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UNITED STATES PATENT OFFICE.

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PIPE-JOINT.

SPECIFICATION forming part of Letters Patent No. 424,799, dated April 1, 1890.

Application filed October 3, 1889. Serial No. 325,820. (No model.)

To all whom it may concern:

Be it known that I, FRANK I. LESSARD, a citizen of the United States, residing at Manchester, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Pipe-Joints; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in pipe-joints, the object thereof being to perfect and complete the connecting-joints of pipes and provide means whereby ferrules may be successfully introduced into lead pipes for the purpose of connecting iron pipes and lead pipes together in the various operations of plumbing; and the invention consists, essentially, in the construction, arrangement, and combination of parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a longitudinal sectional view of a lead pipe having its end expanded in accordance with the principles of the present invention, and showing also in side elevation the expanding-tools located within the end of the pipe in operative position for causing the enlargement of the end of said pipe. Fig. 2 is a similar longitudinal sectional view of the lead pipe, the iron hub, the ferrule within the pipe, and the calking, the expanding-tool being removed from the pipe. Fig. 3 is a detail sectional view of the iron ferrule adapted to be located within the expanded end of the lead pipe. Fig. 4 is a detail side elevational view of the expanding-tool.

Similar letters of reference designate corresponding parts throughout the different figures of the drawings.

A denotes a section of a lead pipe, which pipe may be of any suitable size as respects its length and diameter and adapted for any desired use. In carrying my invention into practical effect I first take the lead pipe, as A, and expand or enlarge the diameter of the end portion thereof in a peculiar manner. This diametrical enlargement of the lead pipe is accomplished by forcibly inserting thereinto a tool or rounded plugging device, preferably of wood, but which may be made of iron or of any other suitable metal. D denotes this expanding-tool. It varies in diameter throughout different portions of its length. The portion of largest diameter is lettered D′ and constitutes the handle portion, which is adapted to be grasped by the mechanic when the tool is being forced into the end of the lead pipe.

D^2 designates a portion of the tool of less diameter than the part D′, there being a rounded shoulder d at the point where the diameter of the tool changes from the portion D′ to the portion D^2. The inner end section of the tool is represented by D^3. It is beveled, tapered, or inclined at a suitable angle. Between the beveled section D^3 and the cylindrical section D^2 is a shoulder d'. The cylindrical section D^2 is of such length that when it is inserted in the pipe it will produce a cylindrical enlargement thereof of a length corresponding to the length of the iron ferrule which is to be inserted into the end of the pipe after the expanding-tools have been withdrawn therefrom.

When the tool thus described has been forced into the end of a lead pipe for the purpose of enlarging the same in diameter, the effect produced in the shape of the pipe may be seen from an inspection of Figs. 1 and 2. The tapering end of the tool will make the pipe inclined at a. The shoulder d' will produce the shoulder a' in the lead pipe. The cylindrical section D^2 will form the cylindrical section a^2. The shoulder d on the tool will produce the shoulder a^3 on the pipe. That part of the handle portion D′ of the tool which enters the pipe (and it may be here stated that the tool will be forced into the pipe until the small portion of the end D′ is inside the pipe) will produce the pipe end a^4. The cylindrical portion a^2, it will be observed, has a considerably greater diameter than the normal diameter of the pipe A. Said cylindrical portion a^2 is of a proper length to receive the iron or other metallic ferrule C. (See Fig. 3.) This iron ferrule C has a peripheral flange c on its outer end, the inner side of which flange is inclined, as shown By referring to Fig. 2, the location of the flanged ferrule within the expanded pipe end is clearly indicated. The main portion of the ferrule fits nicely

within the section a^2 of the pipe, the inner end of said ferrule abutting neatly against the pipe-shoulder a'. The flange c upon the ferrule fits closely and neatly against the pipe-shoulder a^3, and the pipe end a^4 is folded over the end of the iron ferrule, said folded end being adapted, after the pipe joint has been calked, to serve as a packing between the end of the ferrule and the inside of the hub in the iron pipe.

In using the above-described tool in the construction of my improved pipe-joint it will be found best to oil the tube before it is driven in the pipe. It will thus be seen that by the use of this tool a lead seat is formed of the exact size needed to accurately and neatly receive the iron or other metallic ferrule, after which the lead of the pipe end can be folded over the flanged ferrule to form a packing, as has already been alluded to.

In Fig. 2 B denotes the iron-pipe hub. The ferrule C and the pipe-hub B are both usually made of iron, although they may be made of other metal. E denotes the calking material, which is filled in around the expanded end of the pipe A, between it and the flaring or bell-mouth end of the pipe-hub. The ferrule and hub being of iron, it will be manifest that they will expand in consequence of heat. Such expansion will cause the lead between these parts to be pressed tighter and tighter, and this compressed lead remains firmly compressed after the cooling of the ferrule and the hub or either of them has contracted the iron. Heretofore all connections of lead pipes with iron pipes have been rendered impracticable, owing to the unequal expansion and contraction of these two metals and has sooner or later caused a leakage at the point of the connection of the iron and lead pipe. My invention aims to avoid such leakage. My invention utilizes this unequal expansion and compels it to perform a valuable service. By the construction of the joint as I have described the joint is tightened instead of loosened in consequence of the unequal expansion of the metals.

Before inserting the calking material I preferably paste paper around the lead pipe, so as to prevent the hot lead or calking from melting the lead pipe. I then insert the end of the pipe which carries the ferrule into the hub and then pour in the lead calking, which lead, after it has cooled, is calked in the ordinary way, and this calking tends to tighten all the parts of the joint—a result that cannot be obtained by calking as employed in other common and well-known methods for connecting iron and lead pipes. In this way lead pipes of any size or width or length may be connected with their iron hubs, and I maintain that my improved method and joint is cheaper and better than any of the others now in common use, and that it can be applied in smaller and closer quarters than can the others, all the while maintaining the full size of the pipe throughout the work, and further advantage lies in the fact that my method requires no solder whatever. It is well known that soldered pipes coming in contact with sewer-gases will corrode and become brittle, thus causing leakage. This difficulty, therefore, my invention overcomes by dispensing with the use of solder. Further, the invention can be practiced by persons entirely ignorant of the art of soldering.

The folding of the end of the lead pipe over the flanged ferrule, which I have already described, enables my joint to possess many advantages over other joints now in use, because when hot lead is poured into the hub it causes the lead pipe around the iron ferrule to expand. This expansion is liable to loosen the ferrule, which is liable to be moved out of its place while the calking is going on, or in consequence of any blows upon the pipe or any jarring thereof in working thereupon—a disadvantage which cannot possibly occur when my joint is used.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the pipe A, having the diametrically-enlarged sections a^2 and the enlarged end a^4, the iron ferrule C, inserted within the pipe-sections a^2 and having a peripheral flange c, over which the pipe end a^4 is folded, and the pipe-hub receiving the said pipe, substantially as described.

2. The combination of the pipe A, having the tapered portion a, the shoulder a', the straight cylindrical portion a^2, the shoulder a^3, and the enlarged end a^4, the ferrule C, having the peripheral flange c, said ferrule being located within the expanded pipe, with the end a^4 of said pipe folded over the flange c of the ferrule, substantially as described,

3. The combination of the pipe A, having the tapered portion a, shoulder a', cylindrical portion a^2, shoulder a^3, and enlarged end a^4, the iron ferrule C, having the peripheral flange c, said ferrule being located within the expanded pipe and having the end a^4 folded over the flange c, the iron hub B, receiving the said expanded pipe end, and the calking material E, located between the pipe and the hub, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK I. LESSARD.

Witnesses:
JOHN A. RIDDLE,
B. P. CILLEY.