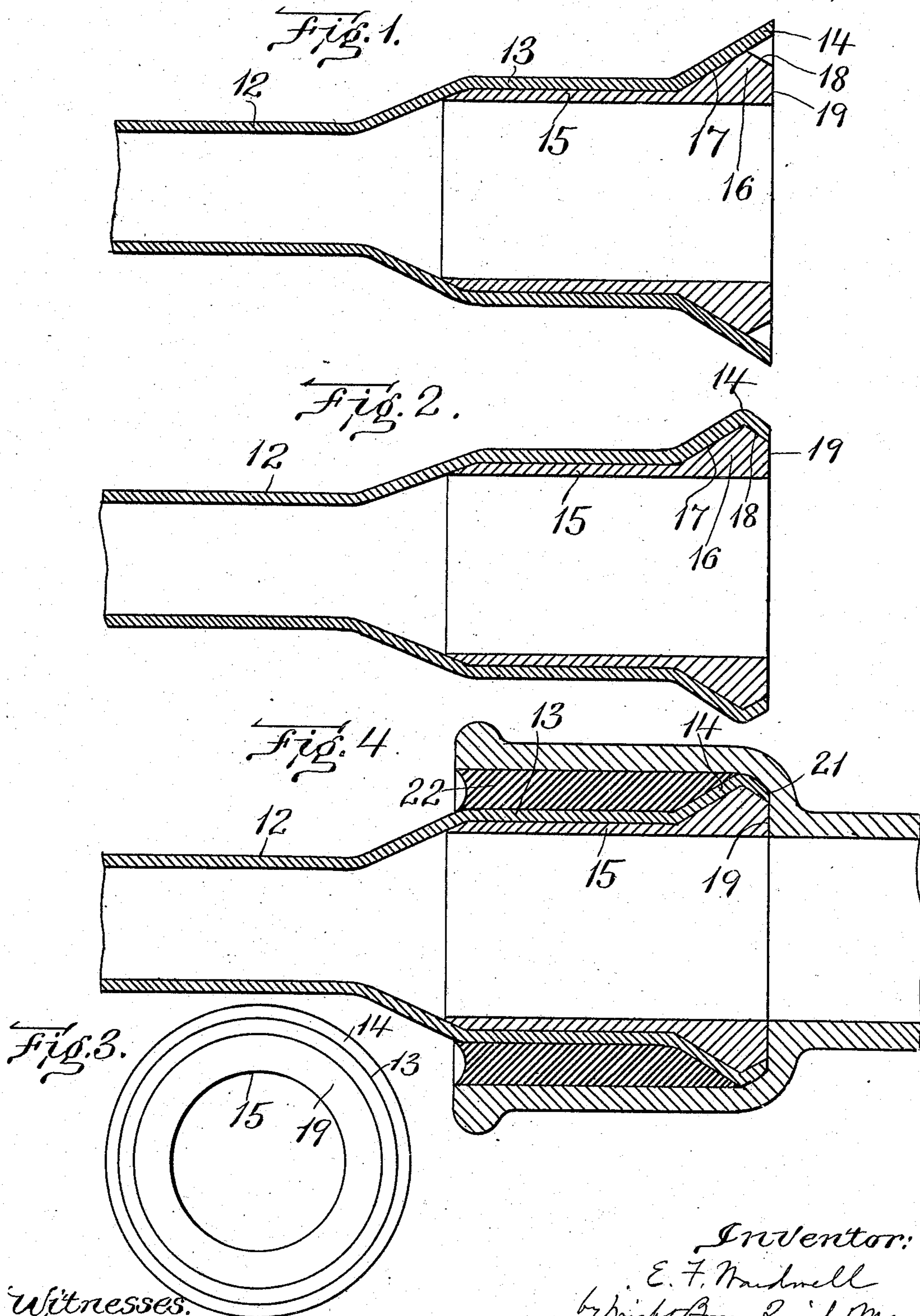


E. F. WARDWELL.
 REINFORCED LEAD PIPE.
 APPLICATION FILED MAY 13, 1909.

936,839.

Patented Oct. 12, 1909.



Witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD F. WARDWELL, OF WOODSTOCK, VERMONT.

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936,839.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD F. WARDWELL, of Woodstock, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Reinforced Lead Pipe, of which the following is a specification.

This invention relates to so-called lead and iron joints employed in connecting a lead pipe with a hard metal conduit portion, such as a bell mouth formed on a soil pipe, the lead pipe being employed to connect a sink, lavatory, etc., with the soil pipe. For convenience, I will hereinafter refer to the portion of the soil pipe which receives the end of the lead pipe, as the socket.

It is customary to expand the end of the lead pipe which is to be inserted in the socket, and to place within the expanded portion of the lead pipe a hard metal ferrule, usually of cast iron, the internal diameter of the ferrule being substantially the same as that of the conduit on which the socket is formed. The ferrule is enlarged at its outer end and interlocked with the expanded portion of the lead pipe by so forming the end of the pipe that it engages the enlargement of the ferrule. Heretofore, the form of the ferrule has been such as to necessitate the bending of the end of the lead pipe inwardly over the outer end face of the ferrule, the inwardly bent portion of the lead pipe covering the said end face and being interposed between the latter and the shoulder formed at the inner end of the socket. The operation of bending the end of the lead pipe over the end face of the socket is one which requires a good deal of care, and involves a considerable expense for time and labor. Moreover, owing to the fact that the inwardly bent portion of the lead pipe entirely covers the end face of the ferrule, the hard metal of the ferrule does not abut directly against the hard metal of the socket shoulder, so that there is some liability of failure to secure a proper alinement of the lead pipe with the socket because of the compressibility of the inwardly turned end of the lead pipe which bears on the hard metal shoulder of the socket, and is liable to be unequally indented or compressed at different points.

My invention has for its object to enable the expanded end of a lead pipe to be inter-

locked with the enlarged outer end of the ferrule with the minimum cost for time and labor, and in such manner as to enable the end face of the hard metal ferrule to abut directly against the hard metal shoulder at the inner end of the socket.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification,—Figure 1 represents a longitudinal section showing a portion of an expanded lead pipe and a ferrule inserted therein, before the operation of interlocking the ferrule with the pipe. Fig. 2 represents a view similar to Fig. 1, showing the ferrule interlocked with the pipe. Fig. 3 represents an end view of the pipe and ferrule in the condition represented in Fig. 2. Fig. 4 represents a sectional view showing the expanded and reinforced pipe engaged with a socket.

The same reference characters indicate the same parts in all the figures.

In the drawings,—12 represents a lead pipe having an expanded end portion 13, said expanded portion being enlarged at its outer end to form a flaring mouth 14.

15 represents a ferrule composed of hard metal, preferably cast-iron, and formed to externally fit the interior of the main part of the expanded portion 13. Said ferrule is provided at its outer end with a peripheral ridge 16 having an inner face 17 tapered in one direction, and an outer face 18 tapered in the opposite direction. The outer margin of the outer face 18 is separated from the internal surface of the ferrule by an annular end face 19 constituting the outer extremity of the ferrule, said face presenting an abrupt bearing surface at a right angle to the longitudinal center of the ferrule.

The pipe mouth 14 is originally formed of somewhat greater diameter than the ridge 16, so that when the ferrule is inserted in the expanded portion 13, the mouth 14 overhangs the outer inclined face 18 of the ferrule ridge, as shown in Fig. 1. After the parts have been assembled, as indicated in Fig. 1, they are interlocked by bending the extremity of the expanded portion of the pipe inwardly against the inclined face 18 of the ferrule ridge, thus forming a lip which bears closely upon the face 18, the

adjacent portion of the mouth 14 being caused at the same time to bear on the opposite face 17 of the ridge, as shown in Fig. 2. The pipe and ferrule are thus firmly inter-
5 locked.

It will be observed that the inward bending of the end of the pipe upon the inclined face 18 locks the ferrule to the pipe without requiring the bending of the pipe inwardly
10 over the end face 19 of the ferrule, said end face being exposed and practically flush with the end face of the pipe 14.

20 represents the hard metal socket which forms a part of a cast-iron soil pipe or other
15 like conduit, and has an inwardly projecting shoulder at its inner end. The diameter of the portion of the conduit surrounded by said shoulder is practically the same as the internal diameter of the ferrule 15. When
20 the expanded end of the pipe reinforced by the ferrule 15 is inserted in the socket 20, the hard metal abrupt end face 19 of the ferrule comes to a bearing on the hard metal shoulder 21, the end face of the inwardly bent
25 portion of the pipe also coming to a bearing on the shoulder 21 at the same time. This reciprocal bearing of the two hard metal parts prevents liability of any deviation from the proper alinement of the lead pipe with
30 the socket.

The expanded and reinforced portion of the lead pipe may be secured in the socket by means of a packing 22 of lead or any
35 other suitable material forced into the annular space between the socket and the exterior of the expanded portion 13, as shown in Fig. 4.

I claim:

1. A pipe-reinforcing ferrule having at its outer end an external peripheral ridge, the
40 sides of which are oppositely tapered, the outer margin of the outer tapered side being outside the inner surface of the ferrule and separated therefrom by an outer abrupt end
45 face formed on the ferrule, whereby an expanded lead pipe may be interlocked with the ferrule by conforming its outer end portion to the said ridge without bending the end of the pipe over the end face of the ferrule.
50

2. A pipe-reinforcing ferrule having at its outer end an external peripheral ridge, the
55 sides of which are oppositely tapered, the outer margin of the outer tapered side being outside the inner surface of the ferrule and separated therefrom by an outer abrupt end face formed on the ferrule, combined with
60 a lead pipe having an expanded end portion formed to fit the exterior of the ferrule and overhang the outer side of the said ridge, the overhanging portion of the pipe being bent
65 inwardly against the said outer side, and having an end face which is flush with the outer end face of the ferrule, the end faces of the ferrule and pipe being substantially at a right angle to the longitudinal center of the ferrule whereby both of said faces may bear on a shoulder of a socket.

In testimony whereof I have affixed my signature, in presence of two witnesses.

EDWARD F. WARDWELL.

Witnesses:

JAS. H. CHURCHILL,
C. F. BROWN.