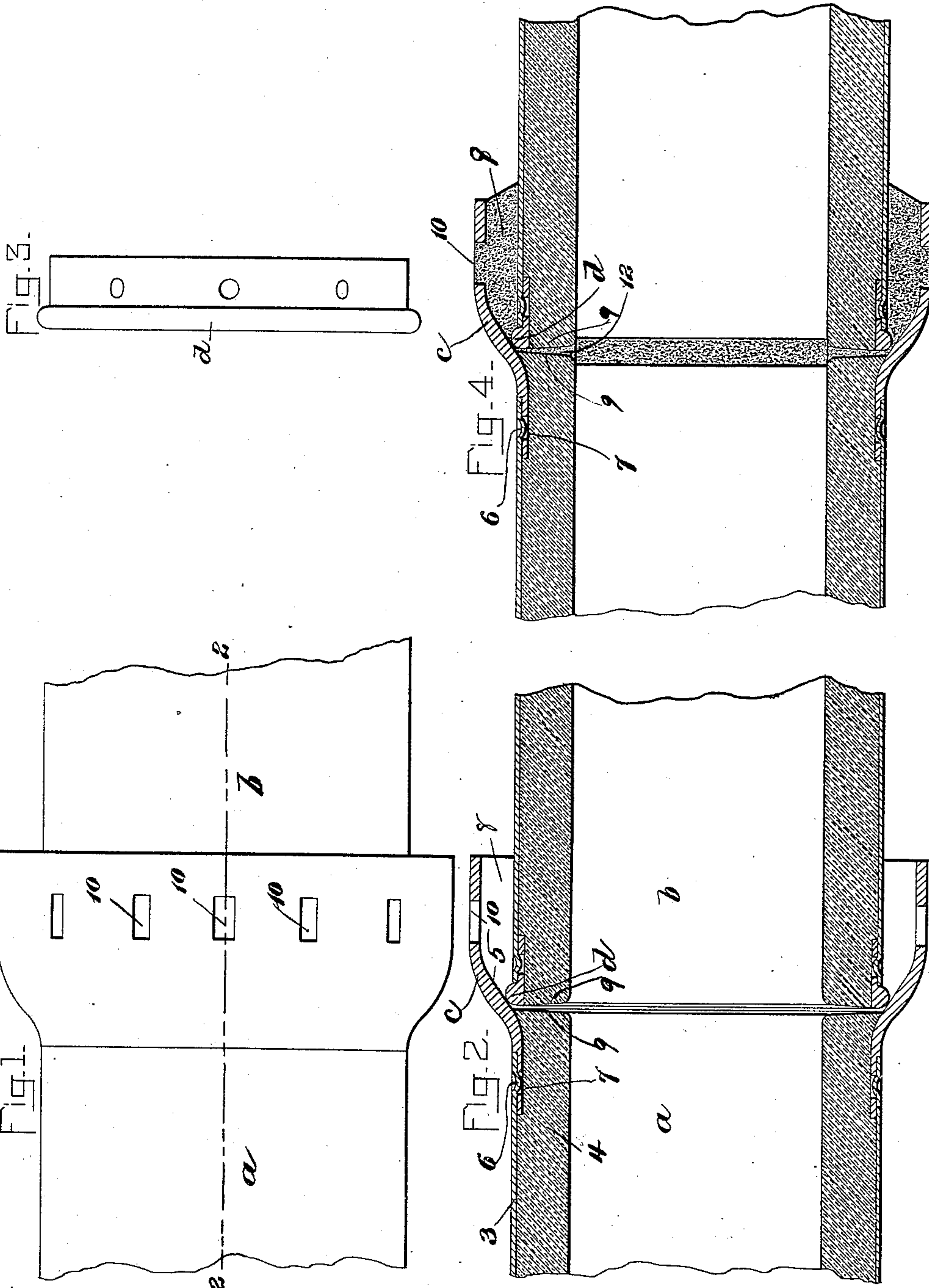


(No Model.)

H. B. NICHOLS.  
CEMENT LINED PIPE.

No. 429,947.

Patented June 10, 1890.



WITNESSES:  
A. S. Hanson.  
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# UNITED STATES PATENT OFFICE,

HENRY BERT NICHOLS, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN WILLIAM LINZEE, JR., OF SAME PLACE.

## CEMENT-LINED PIPE.

SPECIFICATION forming part of Letters Patent No. 429,947, dated June 10, 1890.

Application filed February 6, 1890. Serial No. 339,485. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY BERT NICHOLS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cement-Lined Pipes, of which the following is a specification.

This invention relates to pipes or conduits which are composed of sheet-metal sheaths or external casings and linings of cement formed within said sheaths or casings.

The invention has for its object to provide a simple construction whereby sections of pipe of this class can be securely joined together end to end and set at any desired angle one with another, and also to prevent the access of water to the metal portions of the pipe-sections at the joints thereof.

The invention consists in the improved construction, which I will now proceed to describe and claim.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of portions of two lengths of pipe embodying my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a side elevation of the cast-metal collar, which is applied to one end of one of the sections. Fig. 4 represents a section similar to Fig. 2, showing the two pipe-sections secured together by cement inserted in the receptacles shown in Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a b* represent portions of two lengths or sections of cement-lined pipe, each section being composed of a sheath or casing 3 of sheet metal and a molded lining 4 of cement formed upon the interior of said sheath or casing.

*c* represents a socket or mouth-piece of cast metal, which is reduced at one end, its reduced end being interposed between the sheath 3 and the cement lining 4 of the section *a*. The enlarged end of the socket or mouth-piece *c* projects from the end of the section *a*, and has an inclined seat 5 on its inner surface. The reduced end of the socket or mouth-piece *c* is embedded in the cement lining, as shown in Fig. 2, and is thus secured

to the section *a*, and is additionally secured by means of indentations 6 made in the sheath or casing 3, said indentations projecting into orifices 7, formed in the reduced end of the socket or mouth-piece *c*.

*d* represents a cast-metal ring or collar, which is interposed between the sheath and cement lining of the section *b*, and is secured to the latter in the same way that the socket or mouth-piece *c* is secured to the section *a*.

The ring or collar *d* has a rounded bead on its periphery, and is made of such diameter that said bead will bear upon the inclined seat 5, the proportions of said collar being such that the collar comes to a bearing on the seat 5 before the ends of the cement linings of the sections *a b* can come in contact with each other, so that when the end of the section *b* is inserted in the socket or mouth-piece of the section *a* a crevice will be formed between the approximate ends of the cement linings of said sections, as shown in Fig. 2. The ends 9 9 of said cement linings are beveled, as shown in Fig. 2, to form a crevice or pocket 12 of considerable width. It will be seen that when the section *b* is inserted into the mouth-piece of the section *a* an annular cavity or pocket 8 will be formed around the end of the section *b*, and within the enlarged portion of the socket or mouth-piece, said annular cavity or pocket being intended for the reception of a cement packing or filling, as shown in Fig. 4. When the pocket 8 is filled with cement, the joint between the collar *d* and seat 5 is securely closed from the exterior. Said cement packing is interlocked with the socket or mouth-piece *c* by reason of the fact that the said socket or mouth-piece is provided with a series of slots 10 into which the cement projects, the projecting portions of the cement forming tenons, which are engaged with said slots. The pocket 12, between the adjacent ends of the cement lining, is filled with a packing or filling of cement, and said filling protects the joint between the collar *d* and the seat 5 from contact with water from within the tube. It will be seen, therefore, that the collar *d* and seat 5 are effectually protected against the action of moisture, being entirely covered on both sides of the joint



between them by the cement fillings and packings inserted in the pocket 8 and crevice 12.

It will be observed that by the construction above described practically as great a thickness of cement is obtained at the joint as at other parts of the pipe, and that there is no liability of forming a shoulder or internal projection on the inner surface of the cement lining at the joint. It will also be observed that the inclined seat 5 and the collar *d* with its rounded bead enable the sections *a b* to be set at various angles with each other, so that the course of the conduit composed of the sections shown may be made to deviate considerably from a straight line in any desired direction.

The improved conduit hereinbefore described is adapted particularly for use as a conduit or holder for electric wires; but it is obvious that it may be used to conduct water or for any other purpose to which it may be found applicable.

I claim as my invention—

As an improvement in cement-lined pipes, the combination of the two sections *a b*, each composed of a metallic sheath having a cement lining, which has a beveled or reduced

end 9, the metallic socket or mouth-piece *c*, having a reduced end interposed between the sheath and lining of the section *a*, an enlarged end projecting beyond the end of the lining, and a tapering internal seat 5, said enlarged end forming a cement-receiving pocket 8, surrounding the section *b*, and the metallic collar *d*, interposed at one end between the sheath and lining of the section *b* and having a bead on its outer end formed to bear on the seat 5, the said reduced end 9 of the cement lining forming an annular pocket 12 between the abutting ends of the two sections adapted to receive a filling of cement, whereby the joint between the two sections is made water-tight and access of water from within the pipe to the socket *c* and collar *d* is prevented, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of January, A. D. 1890.

HENRY BERT NICHOLS.

Witnesses:

C. F. BROWN,  
A. D. HARRISON.