

J. A. MIDDLETON.

Manufacture of Cement Pipes.

No. 133,875.

Patented Dec. 10, 1872.

Fig: 1,

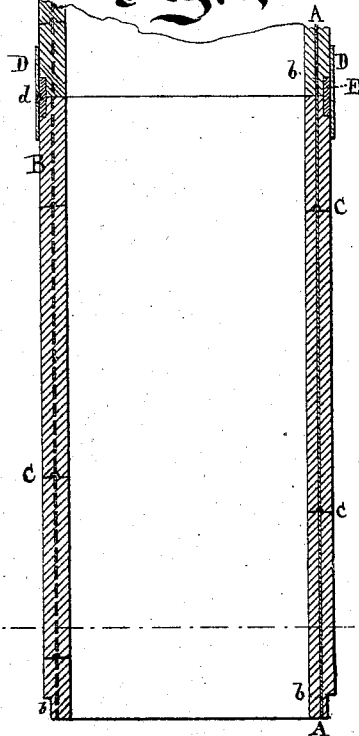


Fig: 3,



Fig: 4,

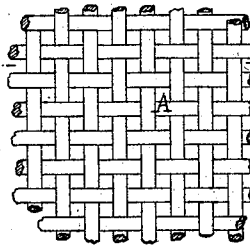
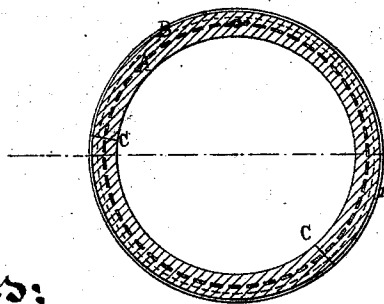


Fig: 5,



Fig: 2,



Witnesses;

W. C. Dwyer
C. Raettig

Inventor:

John A. Middleton
by his attorney, J. S. Sisson.

UNITED STATES PATENT OFFICE.

JOHN A. MIDDLETON, OF NEW YORK, N. Y., ASSIGNOR TO WILLIAM S. MIDDLETON, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF CEMENT PIPES.

Specification forming part of Letters Patent No. 133,875, dated December 10, 1872.

To all whom it may concern:

Be it known that I, JOHN A. MIDDLETON, of New York city, in the State of New York, have invented a certain Improvement relating to the Manufacture of Pipes, of which the following is a specification:

My pipes are made in short lengths by molding a plastic or semi-fluid composition strengthened by a metallic net-work. They may be used for drain-pipes, or for water-pipes; or for various other uses. The metallic strengthening material enables the pipes to resist pressures up to three hundred pounds to the square inch for pipes of ordinary diameter, say twelve inches inside.

I will proceed to describe what I consider the best means of carrying out the invention.

The accompanying drawing forms a part of this specification.

Figure 1 is a longitudinal central section; Fig. 2 is a transverse section on the line S S in Fig. 1; Fig. 3 is a section, enlarged, through the wire cloth alone; Fig. 4 is a face view of the wire-cloth; and Fig. 5 shows one of the extra wire shapes which may be introduced to aid in holding the wire-cloth in position.

Similar letters of reference indicate like parts in all the figures.

The metallic strengthening material will be designated by the general letter A. It is a wire-cloth, formed of wires of proper thickness, woven together by any of the means now practiced in wire-weaving, but it is better that both sets of the wires—that is to say, both the warp and the weft—are about equally bent in passing each other; in other words, all the wires are wavy or serpentine.

In preparing to mold my pipe, the mold may be similar in its general construction to that described in the application for patent by my partner, John S. Roake, allowed July 15, 1872. The wire-cloth being introduced in the proper position, and held in place by any suitable means, a semi-fluid stony composition, B, is poured in and allowed to harden, forming strong pipe, in which the stony composition B forms both the outer and the inner surface, and the wire-cloth A is embedded in or near the middle of its thickness. The molds are so constructed that a rabbet, *b*, is formed around the exterior at each end. When the ends of

two sections are abutted together in the proper position to form a joint they fit tightly at their inner edges, and out as far as the wire-cloth, and a little beyond it. Outside of this the rabbet *b* on each provides a recess extending quite around, which is to be afterward filled. I apply a sheet-metal band, D, and supply the filling material E through a hole, *d*, provided in the band D. I prefer to employ a grout of proper thickness, composed of cement and sand. The band D being formed of plain iron, with lugs suitably formed at the end and drawn together by a strong screw-bolt, holds the ends of the pipes stiffly in position and in line, and the cement applied within, swelling a little in setting, forms a perfectly-tight joint. A thicker cement may be used by applying it in a plastic state with a trowel, quite around, in a sufficient quantity to a little more than fill the rabbets *b*, and immediately afterward compressing thereon the sheet metal D. The wire-cloth may be studded at intervals with cross-wires *c*, of a length only a little less than the thickness of the entire pipe. These serve to hold the wire-cloth steadily in its position in or near the middle of the thickness of the pipe. The wire-cloth should be cut of a size a little more than sufficient to reach around, and the overlapping edges may be joined together by bending in a manner analogous to the junction of stove-pipe metal, or rivets or other ordinary fastenings may be employed. It may be woven or knit in a complete cylinder, if preferred.

The wire-strengthening material A possesses this distinctive peculiarity, different from mere sheet metal or perforated metal, that, as the composition B shrinks in cooling, the wires by increasing their serpentine condition, or by slightly changing their positions relatively to each other, allow for this. My experiments have not fully determined whether the material is sufficiently plastic in the interior at the period of the shrinkage, or after the most of it has taken place, to allow it to perfectly follow up these increased bendings or changes of position of the wires; but I believe that this is the case, for I find the pipe very greatly strengthened by the addition of the wire. At any rate the wires are so conditioned in their positions that when the pipe is subjected to a

bursting strain the wires contribute their strength to the mass before the elasticity of the stony portion has been fully exhausted. The composition I employ will bear about one hundred and fifty pounds to the square inch without the metallic strengthening. With the strengthening the parts will bear about three hundred pounds to the square inch. I can employ the composition described in the patent of William A. Battersby, dated August 2, 1870. Various other compositions may probably be used with success. I prefer, however, one which I have invented, and shall make the subject of a separate application for patent.

It may be proper to state here that it contains in the proportion of one hundred and sixty-five pounds clean sand, twenty-five pounds pulverized clay, twenty pounds pulverized limestone, and eighteen pounds of resin, agitated together at a high temperature, about 750° Fahrenheit, and poured into the mold at a temperature of about 400° Fahrenheit.

Fig. 5 shows one of the wires C properly bent and adapted to be introduced in the wire-cloth A, extending out so as to touch the mold

outside and inside, and aid in sustaining the wire-cloth while the composition B is poured.

I claim as my invention—

1. The within-described pipe having a wire-cloth, A, embedded in the molded material B, and adapted both to yield to the contractile action of the earthy composition in cooling and to aid in resisting a bursting force, substantially as herein specified.

2. In a compound pipe, substantially of the character herein specified, the cross-wires *c* formed and applied to the wire-cloth A, as specified, so as to hold the parts firmly in position while the plastic material is being poured.

3. The embracing-band D formed of plain sheet metal, bending around, and provided with suitable tightening means, in combination with the rabbeted pipes B *b* and the filling material E, as herein specified.

In testimony whereof I have hereunto set my hand this 29th day of August, 1872, in the presence of two subscribing witnesses.

J. A. MIDDLETON.

Witnesses:

WM. C. DEY,

THOMAS D. STETSON.