W. MACKINTOSH.

UNDERGROUND TELEGRAPH LINE.

No. 186,355. Patented Jan. 16, 1877.

Fig. 1.

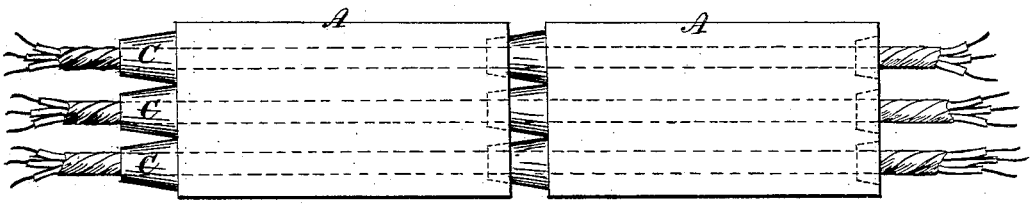


Fig. 2.

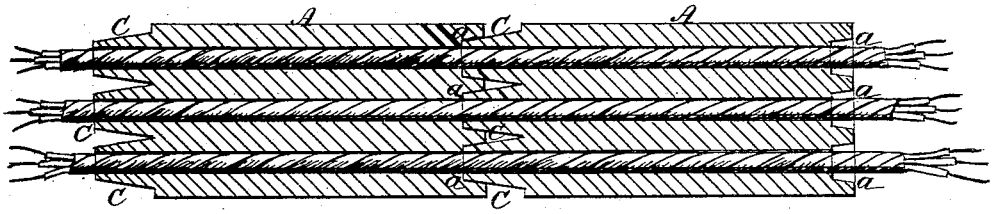


Fig. 3.

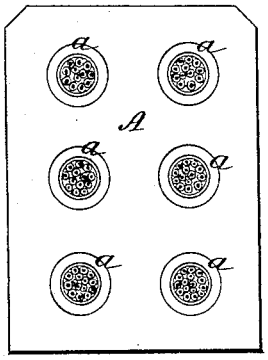


Fig. 4.

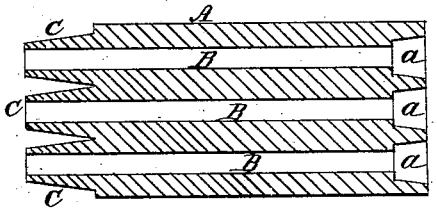
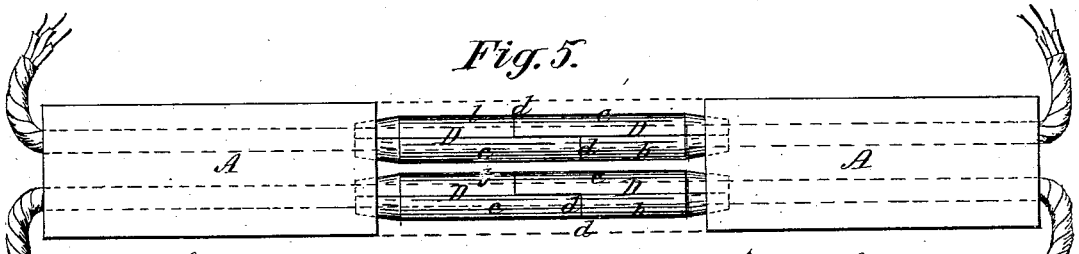


Fig. 5.



Witnesses:

J. H. Rutherford

W. E. Chaffee.

Inventor:

William Mackintosh

by Johnson & Johnson.

his Attorneys

Washington D.C.

UNITED STATES PATENT OFFICE.

WILLIAM MACKINTOSH, OF NEW YORK, N. Y.

IMPROVEMENT IN UNDER-GROUND TELEGRAPH-LINES.

Specification forming part of Letters Patent No. **186,355**, dated January 16, 1877; application filed February 17, 1874.

To all whom it may concern:

Be it known that I, WILLIAM MACKINTOSH, of the city and county of New York, in the State of New York, have invented certain new and useful Improvements in Under-Ground Cables for Telegraph-Lines, of which the following is a specification:

My invention relates to under-ground telegraph-line wires; and the particular matter which constitutes the invention herein claimed consists in the combination, with molded blocks of cement, having a series of longitudinal conduits molded therein, with sectional split cement couplings walled in by cement, for joining two separate blocks, when it is found necessary to remove one in case of injury, or being thrown out of line or broken from any cause.

In the accompanying drawings, Figure 1 represents an elevation of two of the molded blocks of cement joined together by the molded nipples; Fig. 2, a vertical longitudinal section of the same; Fig. 3, an enlarged end view; Fig. 4, a section of one of the blocks; Fig. 5, a top view, showing the split couplings for joining two blocks when one is removed from between them.

In carrying out my invention I mold, from Roman or hydraulic cement, blocks A, of ten to twenty feet in length, with longitudinal conduits B, of a diameter suitable for carrying cables of any suitable number of wires. The blocks are formed in suitable molds, and the conduits formed and made perfectly smooth by polished mandrels fitted in the mold, and kept revolving or made stationary in the cement in the mold during the process of hardening, to render it easy to pass the cables through the conduits. One end of each block has molded with it projecting nipples C, in the line of, and forming prolongations of, the conduits B, and the opposite end of the said block has correspondingly-formed recesses *a*, so that the nipples C of one block fit into the recesses of the other and join the conduits in true lines, as the prolongation of one forms a continuity with the other, and avoids the trouble of fitting couplings into both ends of the blocks.

The cables are passed through the conduits of the blocks as they are laid, and when so laid become solid as rock, and perfectly protect the cables, the insulated wires of which are covered with canvass or bagging, and coated with tar.

The blocks are laid in a trench in the street or sidewalk, and if, from any cause, one or more blocks should become damaged, it is removed from the cables and its place supplied by split coupling-tubes D, made to encompass that portion of the cables exposed by the removal of the blocks and fitted into the ends of the conduits, and a block of cement is formed over and entirely around these couplings, to render them as solid and secure as the walls of the conduits. These couplings are also molded of cement, and they are formed in half-tubes of unequal lengths *b c*, so as to allow them to be fitted over the cables and to break joints on opposite sides, as shown at *d* in Fig. 5.

By this construction, should it be found necessary at any time to remove the cables by the breaking of a wire or cable, it can be easily done by drawing it out of the conduits in any lengths into working vaults, which may be arranged at suitable distances apart, and at the several offices of the city, when a new cable can be introduced into and through the conduits, by first forcing through cords by means of pneumatic suction, in which operation the cord is attached to a box or ball of leather, rubber, or other material as a head, by which a vacuum is formed within said conduit.

A light cord may be drawn through a great length of conduit in this way, which will serve to draw through a stronger cord, to which the cable may be secured and drawn through from one vault to another, thus leaving the conduit and the street intact.

One or more dummy conduits may be made in the blocks, for the purpose of drawing messages through from or to the several offices, the operation of which taking place in the working vaults. Testing-boxes are used in connection with the vaults, for testing the several wires of each cable when required.

Spare conduits for cables may be left in the line of blocks to receive additional cables, which may be afterward needed for the wants of the business.

By this means a cable of fifteen or twenty

wires can be laid through an inch-and-a-half conduit, and as a series of these conduits can be molded with each block, a single line of blocks in any direction will be sufficient to meet all the demands of a large city by drawing the cables through, as described.

A barrel of cement costing one dollar and twenty-five cents will make about forty feet of blocks at a cost of about four dollars, and the line of blocks can be laid, joined, and completed as quickly as sewer or water pipes; and the durability and perfection of such system is almost without limitation or qualification as to derangement of the laid conduit-blocks. Where the nipples join the blocks they are also surrounded solidly by cement applied to the ends of the blocks when laid, so that when hard the blocks will form one continuous block.

I claim—

The combination, with the blocks of incased conduits, of the split and lapped cement coupling-tubes D, also made solid in a cement block, to take the place of a removed conduit-block, as described.

The above specification of my improvement in under-ground cables for telegraph-lines signed this 10th day of February, A. D. 1874.

WM. MACKINTOSH.

Witnesses:

A. E. H. JOHNSON,

J. W. HAMILTON JOHNSON.