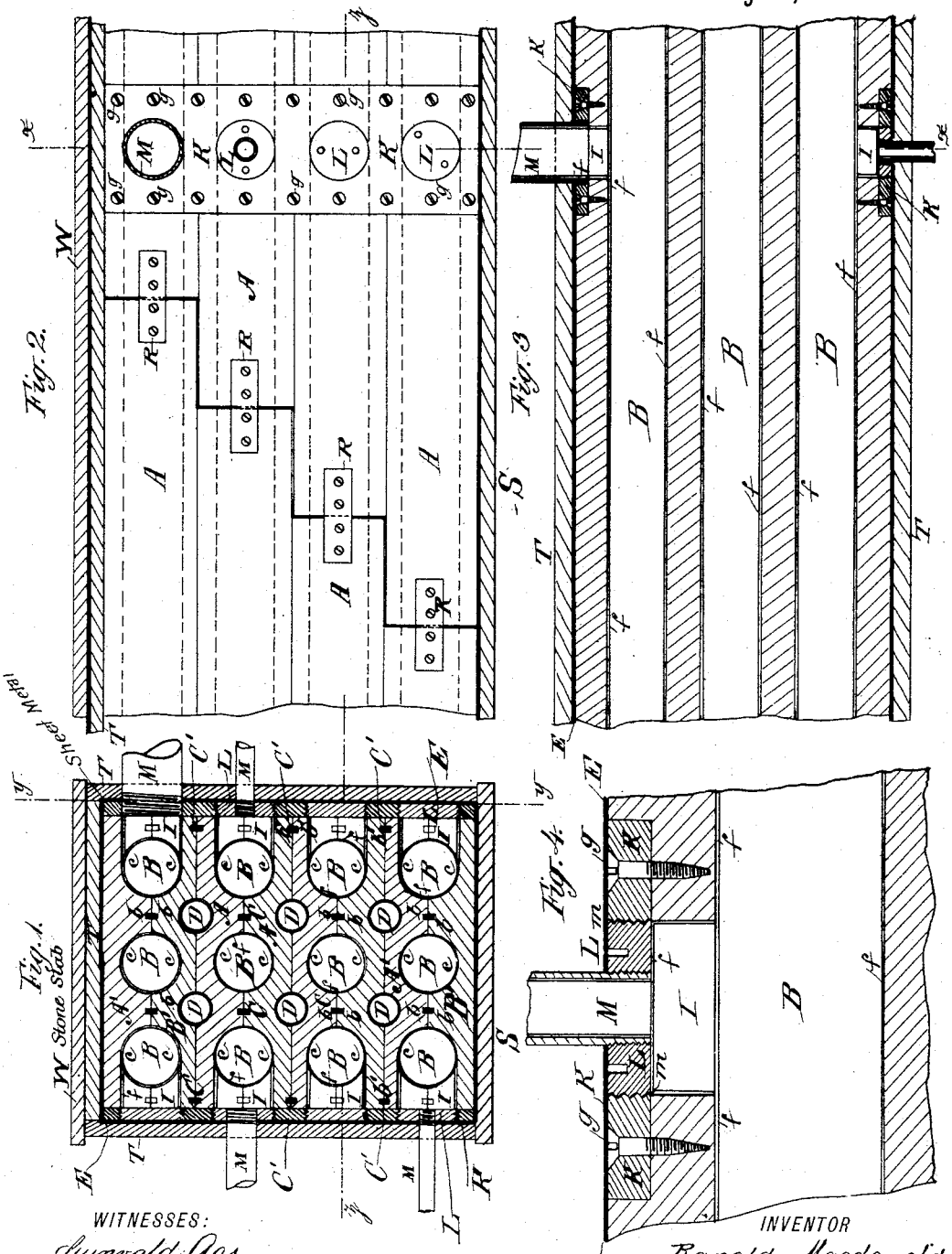
(No Model.) 2 Sheets—Sheet 1.

R. MACDONALD.

UNDERGROUND CONDUIT.

No. 344,843. Patented July 6, 1886.



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(No Model.) 2 Sheets—Sheet 2.

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UNDERGROUND CONDUIT.

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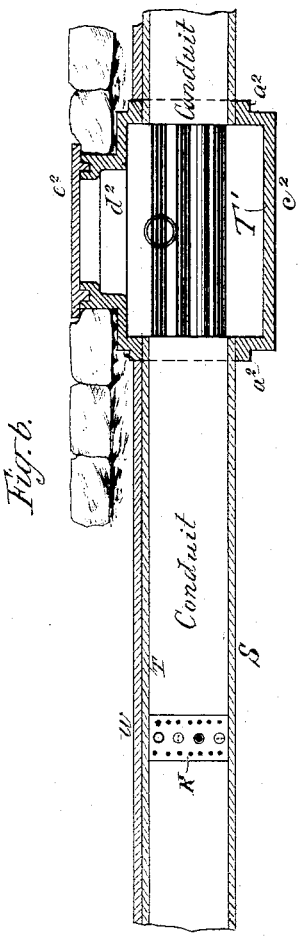

Fig. 6.

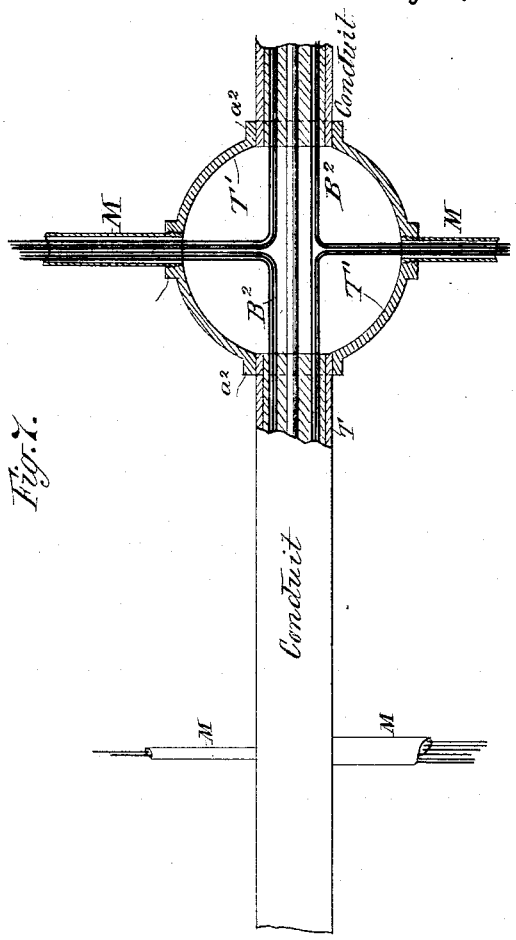

Fig. 7.

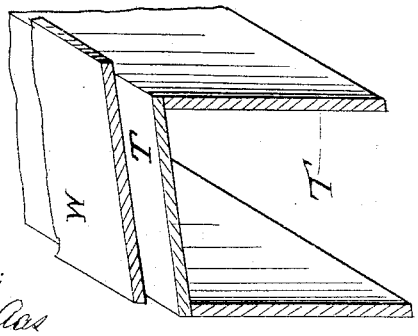

Fig. 5.

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UNITED STATES PATENT OFFICE.

RANALD MACDONALD, OF BROOKLYN, NEW YORK.

UNDERGROUND CONDUIT.

SPECIFICATION forming part of Letters Patent No. 344,843, dated July 6, 1886.

Application filed November 13, 1885. Serial No. 182,678. (No model.)

To all whom it may concern:

Be it known that I, RANALD MACDONALD, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Conduits for Electric Wires, Pneumatic Tubes, &c., of which the following is a specification.

This invention comprises certain novel combinations of parts whereby is provided a subterranean conduit for electric wires, pneumatic transmission of parcels, &c., which, within a small transverse area, provides facilities for the laying of a large number of electric wires or the provision of a considerable number of parallel pneumatic tubes, or, if desired, the combined use of wires and pneumatic tubes in one and the same apparatus, my said invention furthermore insuring great strength, security, and durability in the structure of the apparatus, together with the effectual protection to the wires which may be placed therein, and also great relative cheapness in cost of making and placing in position.

Figure 1 is a transverse sectional view. Fig. 2 is a side and partial sectional view. Fig. 3 is a horizontal sectional view of a subterranean conduit constructed according to my said invention. Fig. 4 is a vertical longitudinal sectional view, on a larger scale, further illustrating the invention as included in Figs. 1 to 3, inclusive. Fig. 5 is a perspective view, on a smaller scale, of one of the parts of the apparatus. Fig. 6 is a vertical sectional view, and Fig. 7 a horizontal sectional view illustrating a further feature of my said invention.

The conduit is composed of two or more horizontal wooden sections, A, superposed the one upon the other, each provided with two or more bores or channels, B, and each upper section kept from lateral displacement upon that below by longitudinal keys C, of wood or other suitable material, which are inserted in coincident grooves *b*, provided in the adjacent surfaces of the sections, the grooves in the upper section receiving the upper portions of the keys C, and those in the lower section the lower portions of said keys, as more fully shown in Fig. 1.

Having reference first to Figs. 1 to 5, inclusive, each of the sections A is made in two longitudinal halves—an upper half, A′, and a lower half, B′. These are kept from lateral displacement with reference to each other by means of keys C′, which are inserted in coincident grooves *b′*, provided in the contiguous surfaces of the two halves of each section in substantially the same manner as the keys C are inserted in the grooves *b*, to keep the sections themselves in due relation with each other. The contiguous sides or surfaces of the two halves of each section are longitudinally grooved, as indicated at *c*, the grooves being semicircular in their cross-section, so that the grooves in the one half are coincident with those in the other half, to provide the cylindrical bores or channels B longitudinally through the section. The circular cross-section is preferred for these bores or channels; but any other may be adopted, if desired. When desired, the contiguous surfaces of the sections themselves may be similarly grooved, to provide additional bores or channels, as shown at D in Fig. 1. All the bores or channels, or so many or such of them as may be desired, are internally coated with paraffine or equivalent rain-proof substance, as indicated at *f*, thereby providing a waterproof layer or lining to the surface of said bores or channels, which is also a non-conductor of electricity, and which affords a smooth surface and is practically imperishable. Around the assembled and superposed sections is placed a sheathing, E, of sheet-copper or equivalent sheet metal, to externally protect the wood and prevent moisture.

In order to provide for tapping certain of the bores or channels B, transverse holes I, corresponding in size and cross-section with the bores or channels at the sides of the several sections, are formed horizontally in the latter, at right angles to and communicating with said outermost bores or channels. These holes I are formed in vertical series, and with the series at any desired intervals along the length of the conduit. The side of the latter is vertically recessed coincident with each of said series of holes I, to permit the insertion of a metallic plate, K, which is held fast in position by screws *g*, or by any other suitable means. Each plate K is provided with openings *m*, substantially the same in size and shape with the holes of the series at which it is placed,

the openings in the plate being coincident with the said holes. Each of the openings in each plate is internally screw-threaded. Ordinarily each opening *m* is closed by a screw-plug, L, which may be turned by any suitable wrench. When it is desired to tap any of the bores or channels B, which connect with holes I, as aforesaid, the screw-plug is removed, and a suitable pipe or tube, M, is screwed into its place to act as a branch to said bore or channel. The sections A, as the term is used herein, are of course the whole length of the line or apparatus, and each half of each section is of course composed of timbers joined end to end, to provide the requisite length. In practice it is preferred that where the ends of the timbers join, the joints should break joint, in order to give greater firmness and solidity to the structure. Thus, for example, the cross-joints of the several sections are brought in different places, as indicated in Fig. 2. The joints should be strengthened by fish-plates R, as shown in Fig. 2. Under the apparatus should be placed plank or board S the entire length thereof. Around the top and sides should be placed an inverted box, T, (shown in Fig. 5,) and upon the latter a longitudinal series of slabs, W, of slate, blue-stone, or the like.

The bores and channels of the apparatus may be used for receiving electric wires or cables, or for the purposes of pneumatic transmission of parcels, &c.

In Figs. 6 and 7 is shown a man-hole and construction by which conduits may be made to diverge in different directions from each other, and by which access may be had to the conduit for the insertion or withdrawal of wires, or for any other requisite purpose. The conduits are placed with their ends at the required angles to each other, said ends being inserted in openings of corresponding shape and size in the sides of a chambered casting, T′, which, by means of bolts or screws or other suitable devices passed through flanges a^2 on the casting T′, is secured to the ends of the conduits, so that the wires B^2 of the latter may lead off from one of the conduits to the others, as more fully shown in Fig. 7. The chambered casting T′ is preferably of cylindrical contour, with a permanently-closed bottom, c^2, and a top, d^2, which may be opened at will, to afford access to the interior, but which, under ordinary conditions, is to be closed by a suitable cover, e^2. The branch pipe or pipes M are to be coated or lined internally with paraffine or its equivalent, in the same manner as the bores B of the conduit.

What I claim as my invention is—

1. A subterranean conduit consisting of a series of superposed sections, each composed of two parallel half-sections united by tongues and grooves and having the longitudinal channels B, a sheathing of sheet metal inclosing the said sections, an inverted trough-shaped box placed over the said sheathing and inclosing the said sections at the top and sides, a continuous board placed under the entire length of the sections, and a longitudinal series of stone slabs placed upon the said box, substantially as described, for the purpose set forth.

2. A conduit for electric wires, consisting of a series of superposed sections, each composed of two parallel half-sections united by tongues and grooves and having the longitudinal channels B for the wires, a coating of paraffine covering the surfaces of the said channels for insulating the wires, a sheathing of sheet metal inclosing the said sections, and an inverted trough-shaped box placed over the said sheathing and inclosing the said sections at the top and sides, substantially as and for the purpose set forth.

RANALD MACDONALD.

Witnesses:
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