

(No Model.)
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CONDUIT FOR UNDERGROUND WIRES.

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UNITED STATES PATENT OFFICE.

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CONDUIT FOR UNDERGROUND WIRES.

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To all whom it may concern:

Be it known that we, WARREN D'B. SMITH and FRANK J. MILLIKEN, both of Boston, in the county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Conduits for Underground Telegraph, Telephone, and Electric-Light Wires, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical transverse section of our improved conduit, the wires being represented as in position for use; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a side elevation showing the means of locking or securing the cover; Fig. 4, a sectional view showing a man-hole, and Fig. 5 a view showing the floor of the conduit proper.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

Our invention relates to that class of conduits which are designed for underground telegraph, telephone, and electric-light wires; and it consists in a novel construction and arrangement of the parts, as hereinafter more fully set forth and claimed, by which a more desirable and effective device of this character is produced than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation:

In the drawings, A represents the street or street-level; B, the curb-stone; C, the sidewalk; D, the ventilating-pipes, and E the bottom.

The conduit proper is composed of the side pieces, H, which are connected at intervals at their lower edges by the cross-bars J, and provided with the cover K, having a downwardly-projecting flange, *z*, at either side, adapted to fit corresponding rabbets or grooves in the upper edges of the side pieces.

The cross-bars J are supported on walls of masonry L, which rest on the bottom E, and projecting downwardly from said bars, and extending longitudinally of the conduit, there

are two flanges or bars, *m*, designed to prevent the walls L from caving or falling inwardly.

Disposed on the bars J within the conduit proper there are transversely-arranged blocks or supports M, on which the wires *f* are placed, the wires, of course, extending longitudinally of the conduit.

A cap-block or binder, N, is placed over the block M, the binder being held in place by a key-block or wedge, *z*, which is driven under the overhanging arm *i* of the standard O, which projects upwardly from the cross-bar J, each of said cross-bars being provided, if necessary, with one of said standards, blocks M N, and a key, *z*.

From the foregoing it will be observed that the conduit, considered as a whole, has two compartments extending longitudinally thereof its entire length—viz., the compartment P, within the conduit proper, in which the wires *f* are laid, and the compartment T, beneath the bars J—said compartments communicating with each other through the openings between said bars.

Opening into the compartment or chamber T through the curbstone B and outer wall, L, there are a series of induction-flues, *h*, disposed at suitable intervals, the outer ends of said flues being properly elevated above the ground A to prevent the accidental entrance of water; but the induction-flues *h* may open into the chamber P, if preferred, either above or below the wires *f*, and may be inclined or have their outer ends lowest, to prevent the ready entrance of water. A series of corresponding induction-flues, *b*, open out of the chamber T opposite the flues *h*, and communicating with each of the flues *b*, there is a flue, *l*, passing under the sidewalk C and upwardly through one of the pipes D, the object of the flues and pipes being to keep the conduit thoroughly ventilated.

The cover K is made in sections or strips the ends of which are overlapped and rabbeted together or provided with lock-joints, as shown at S in Fig. 2, to prevent leakage; but any other suitable means for this purpose may be adopted, if desired.

The blocks M N are grooved to receive the wires *f* and keep them properly separated; but the grooves may be omitted, if preferred.

The blocks M N, keys *z*, and standards O serve to clamp the wires at intervals, and thereby hold them suspended between the bars J in the chamber P; but any other suitable means for suspending the wires in said chamber may be employed, if deemed preferable.

The bottom E is composed of ordinary earth, gravel, loose rocks, &c., thereby adapting it to absorb small quantities of water or any moisture which may collect within the conduit. It may, however, be made of cement or masonry, if preferred; and at such points as may be deemed necessary the chamber T may be connected with the ordinary sewer or drain, R, under the street A, for the purpose of carrying off the water which may accidentally gather in the conduit, and which may not be readily absorbed by the bottom E.

By constructing the conduit with a superposed air-chamber, P, and providing the sub-chamber T with ventilating-flues, as described, the atmosphere within the conduit is kept dry and its temperature equalized, thereby surrounding the wires with an atmosphere which corresponds very nearly with the atmosphere outside of the conduit when it is in its best condition for electric telegraphing.

The ventilating-pipes D may be constructed of iron, wood, or any other suitable material, and may stand at the edge of the sidewalk independently of any surrounding object, or may be built against or into the wall of an adjoining building, F, as shown in Fig. 2, if desired. The eduction-flues *b l* may also lead out of the chamber P, either above or below the wires *f*, if desired.

Each of the sides H is provided on its outer face with a projecting clip, *r*, which is widest at its upper end, and a corresponding clip, *t*, which is widest at its lower end. A downwardly-projecting bar or arm, *w*, is secured to either side of the cover K, said arm being provided with a lateral notch, *v*, adapted to receive the clip *r*.

Spaces are formed in the sidewalk C and curbstone B adjoining the cover K, for receiving the clips *t r* and bar *w*, as indicated by the dotted lines *j* in Fig. 2; and in securing the cover to the conduit the lower ends of the bars *w* are inserted between the clips *t r*, and the cover moved longitudinally to cause said bar to engage the clip *r*, after which the parts are locked together by keys or wedges *a*, driven down between the bars *w* and clips *t*, in a manner which will be readily obvious without a more explicit description.

It will be obvious that ready access to the conduit proper may be had at all times by removing the cover K, either for the purpose of repairs or laying new wires. It will also be obvious that the conduit proper may be removed bodily with its wires suspended therein, if desired.

The sides H may rest directly on the walls L, if preferred, in which case spaces for re-

ceiving the ends of the bars J should be formed in the top of said walls.

The conduit proper is constructed of iron, the sides H, bars J, and flanges or bars *m* being cast integral or in one piece. The cover K is also composed of iron; but, if preferred, all of these parts may be made of any other suitable materials for the purpose.

It is preferable to leave the spaces between the bars J open to their full extent when the chamber T is employed; but when the conduit passes through an engine-room, coal-room, or other large space beneath the sidewalk C, the chamber T may be omitted at that point, a perforated floor, Q, being placed in the conduit to close the bottom of the chamber and prevent the wires from being tampered with or injured.

The standards O may be cast integral with the bars J, if desired, and said bars placed at any suitable position within the conduit proper. The flanges *m* may also be attached to the side pieces, H, instead of said bars, if desired.

The floor Q may also be used the entire length of the conduit, if deemed essential.

At proper intervals along the line the chamber T is enlarged and extended under the sidewalk C, to form man-holes G, through which the conduit proper passes. These man-holes are each provided with a cover, *y*, and ventilating-flue D, and serve the double purpose of affording access to the conduit for cutting or connecting the wires and also collecting the water, should any gather in the chamber T, the water being carried from the man-hole into the sewer R through the pipe *k*, which is provided with a trap, *g*, to prevent the escape of gas from the sewer.

The block or support M and cap-block N are composed of glass, but may be made of plaster-of-paris or any other suitable non-conductor of electricity, or of wood covered with a vitreous substance, asphalt, or some other good non-conductor of electricity.

It is preferable that the wires *f* should be coated with rubber; but the double air-chambers and ventilators render this unnecessary in most instances.

The wires being also laid independently of each other enables a single wire to be at any time removed without disturbing the others; but we do not confine ourselves to laying the wires singly, as they may be laid in the form of cables, if desired.

It will be understood that the cover K is to be arranged flush with and forms a part of the sidewalk C; also, that the conduit proper and its cover are to be made in proper lengths or sections to enable them to be laid readily.

At the intersection or crossing of streets the conduit is lowered to pass under the street and raised again at the opposite side, the depressed portion being preferably provided with a man-hole and drain leading into the sewer, as described, and also with a ventilating-flue, which

may open through a grating in the man-hole cover or extend to the sidewalk and open into a ventilating-pipe, D.

Having thus explained our invention, what we claim is—

1. A conduit for electric wires, consisting of side walls, transverse bars at suitable intervals supported on said walls, longitudinal flanges connected to said bars, longitudinal side pieces above said walls and resting thereon, wire-holding devices supported on said bars between said side pieces, and a cover supported by said side pieces, substantially as described.

2. A conduit for electric wires, consisting of side walls, transverse bars at suitable intervals supported on said walls, longitudinal flanges connected to said bars, longitudinal side pieces above said walls and resting thereon, wire-holding devices supported on said bars between said side pieces, means for detachably securing said wire-holding devices to said transverse bars, and a cover supported by said side pieces, substantially as described.

3. A conduit for electric wires, consisting of side walls, transverse bars at suitable intervals supported on said walls, longitudinal flanges connected to said bars, longitudinal side pieces above said walls and resting thereon, wire-holding devices supported on said bars between said side pieces, a cover supported by said side pieces, and means for locking said cover thereon, substantially as described.

4. A conduit for electric wires, consisting of side walls, transverse bars at suitable intervals supported on said walls, longitudinal flanges connected to said bars, longitudinal side pieces above said walls and resting thereon, wire-holding devices supported on said bars between said side pieces, means for detachably securing said wire-holding devices to said transverse bars, a cover supported by said side pieces, and means for locking said cover thereon, substantially as described.

5. The combination of an underground conduit, cross-bars J, supported therein, the wire-holding blocks M N, supported on said bars, the L-shaped arms O, secured to said bars and extending upward therefrom, and the wedges z, interposed between said arms and said wire-holding blocks, substantially as described.

6. The improved conduit for telegraph, telephone, and electric-light wires herein described, the same consisting of the conduit proper H J K m, walls L, curbstone B, flues l h b, pipe D, and man-hole G, constructed, combined, and arranged to operate substantially as described.

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Witnesses:

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