THE SMITH ELECTRIC CONDUIT SYSTEM.

THE Smith conduit is an hermetically sealed tube or box, preferably of wood, properly treated by any process calculated to resist moisture and rot, which is laid midway between the rails of any car-track. This conduit or tube contains the electric conductor or supply-wire on its inside bottom surface, insulated from loss by leakage, corrosion, or wear; and its upper or exposed surface is covered with a series of non-magnetizable metallic plates, each about four feet in length, which are screwed down on to strips or sheets of insulating material, and each insulated from its neighbor, so that the surface of the conduit becomes a strip of metal, broken up into sections of not more than four feet each, from which the car, in passing along over its surface, may take off and use a current of electricity, provided they are, for the time being, directly connected with the source of supply at the bottom of the conduit.

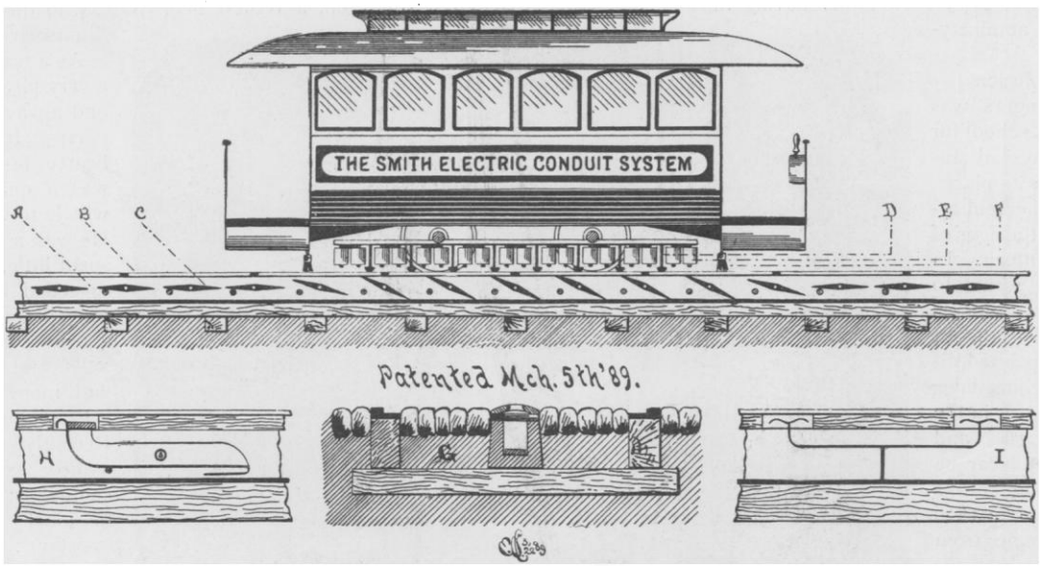
This connection is made in the following manner (see cut): At distances of one or two feet apart, movable connecting pieces are attached to the electric conductor, and rest thereon by gravity until such time as they are attracted from above. The car is provided with a row of magnets on its under surface, which pass along close to the metallic top of the conduit, and, in passing, attract by magnetic influence the connecting pieces before referred to, each of which is provided at one end with a small soft-iron armature. It will thus be seen that as these "connectors" each rises up in its turn through small holes in the top board of the conduit, on touching the lower part of the surface plate, they form a direct electric connection between the cable and such top plates as the car and its magnets cover; so that such parts of the top plates, and only such parts, are always in electrical connection, and form the medium from which the car in its passage is supplied with its current, and power for its electro-motor. It will be noticed that there is no dependence placed on any one connector, but that the magnets are at all times holding up a number of them, or all which may at any one time be beneath the car; and as these connections are constantly being made ahead of the car in its passage, while at the same time broken behind it, the direct attachment of the motor with its source of supply is never broken, and there is no "sparking" between the contact-pieces and the conductor, and no danger of burning out dynamos or connections.

In this system an underground electric supply is given for use where overhead wires are not desired. As the conduit is hermetically sealed, and without any slot or opening whatever, it cannot catch rain, snow and dirt, etc. Immunity from danger is claimed, as the surface of the conduit is dead, and contains no current of electricity, excepting such portions as are covered by the car or cars. By the use of large conductors and a current of low tension, the loss by leakage is reduced, and should almost cease to be a factor in our calculations. The inventor claims that from actual experiments he is assured that this loss, even at such points as may be covered by cars, and under unfavorable circumstances, such as heavy rain and flooded streets, cannot exceed two or three per cent.

The conduit, being not over nine inches deep by five in width, can be laid directly on the cross-ties of the ordinary street-railway track without any cutting of timber or alteration whatever, while it may also be carried around sewer man-holes and ordinary street obstructions. In the case of a single-track road, the benefits of this system are obvious, as the conductor may be branched through all switches and turnouts, and no car can be without power, or light at night, at any point on the road.

The company claims, that, under the patents granted March 5, a conduit can be laid down ready for use at not more than one-half the cost of any other underground system.

It is a part of the plan, as covered by patents, that a blower, or exhaust-fan, or combination of both, should be used to keep a constant current of air passing through the conduit tube at all times, in order to keep its interior free from moisture of condensation, and all its parts thoroughly insulated. This air-current will also serve to detect leaks caused by damage to the conduit from any cause, and insure its immediate repair.



A, longitudinal section of conduit; *B*, insulated top plates; *C*, connectors; *D*, electric brushes; *E*, electro-magnets under car; *F*, sweeping brooms; *G*, vertical section of conduit and track: *H*, scale-beam connector; *I*, steel spring or band iron connector.

A "non-magnetic shield," not shown in the cut, covers the magnets, and prevents the picking-up of iron fragments from the surface of the track, and insures the full efficiency of magnet-power for the purposes for which it is intended.

Each car is provided with brooms at either end, to sweep off surface dirt on its passage, and insure good connections to the rubbing or frictional contact of the electrical brushes or shoes which follow, and carry the current to the motor, from which, after having done its work, it passes off to either rail or the ground. The illustration shows the simplest forms of scale-beam levers used as "connectors," and not necessarily the form preferred in use.

A full investigation as to the merits of the system is invited by Harry W. Smith, the inventor, and the Smith Electric Conduit Company, 120 Broadway, New York.

A COMPOSITE photograph, nearly life-size, of eleven members of the faculty of Washington and Lee University, has been taken upon one sensitive-plate with a total exposure of forty-four seconds, each person receiving an exposure of four seconds. The photographer was Mr. Miley of Lexington, Va.