E. F. PHILLIPS.

Combined Gas and Electric Conductor.

No. 202,047. Patented April 2, 1878.

Fig. 1.

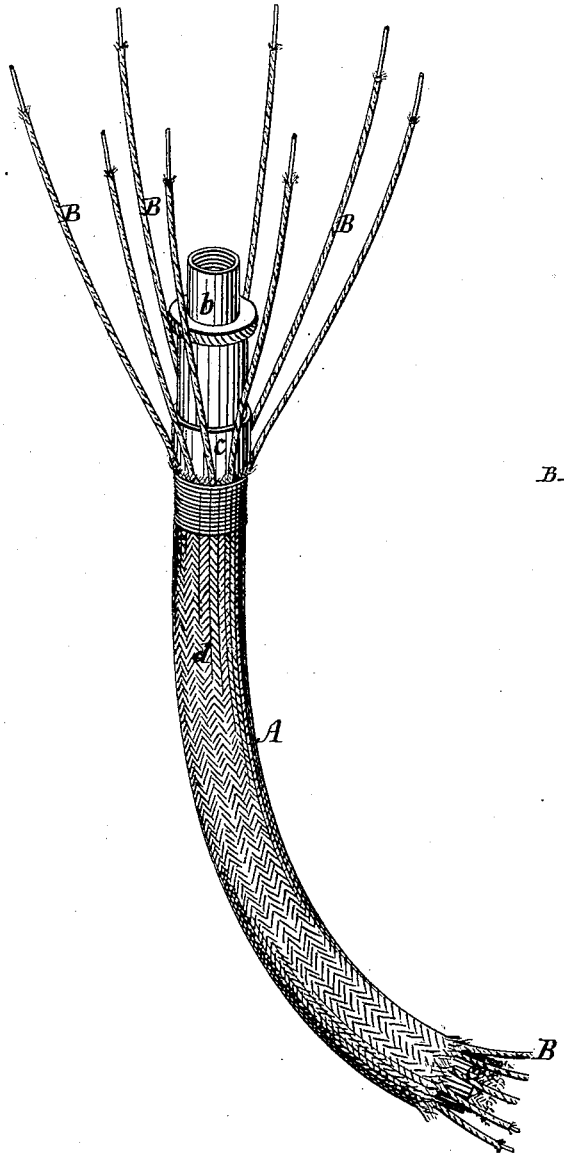
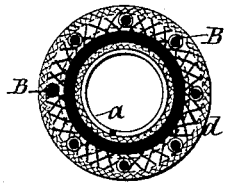


Fig. 2.



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UNITED STATES PATENT OFFICE.

EUGENE F. PHILLIPS, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN COMBINED GAS AND ELECTRIC CONDUCTORS.

Specification forming part of Letters Patent No. **202,047**, dated April 2, 1878; application filed February 5, 1878.

To all whom it may concern:

Be it known that I, EUGENE F. PHILLIPS, of the city and county of Providence, and State of Rhode Island, have invented a certain new and useful Complex Gas and Electric Conductor for Hotel-Elevators, and other similar purposes; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

It is well known that hotel-elevators which are lighted with gas and have electric annunciators are provided with a long flexible tube, for connecting the elevator with a gas-pipe, and a set of electric conductors, either loosely arranged or combined in the form of a cable. The frequent movement of the elevator and the great length of the gas-tube, together with its necessary weight, render such tubes comparatively short-lived, and the permanent couplings are liable to work loose and be defective. When the electric conductors are loosely arranged they are difficult to control, and when combined in a cable they are liable to "kink" or knot, unless specially constructed with a view to obviating that liability. The gas-tube and gas-cable being employed as heretofore, they must be so far separated as to prevent their contact and the wear from abrasion incident thereto.

The object of my invention is to strengthen the gas-tube without using unnecessary material, and to provide for the electric conductors good insulation in a cable form, in which the liability to kink is reduced to a minimum; and my invention consists in a complex gas and electric conductor composed of a flexible gas-tight tube and any required number of insulated electric conductors inclosed within a jacket, whereby the electric conductors contribute to the tensile strength of the gas-tube, and the gas-tube serves as a foundation for the electric conductors, which insures their separation from each other and prevents them from kinking.

To more particularly describe my invention, I will refer to the accompanying drawings, in which—

Figure 1 represents a short length of my complex conductor with gas-coupling attached. Fig. 2 represents the same in lateral section on an enlarged scale.

The gas-tube A is composed, usually, of a spiral-wire foundation, *a*, several braided layers, animal intestines, and glycerine and glue, substantially as set forth in the United States Letters Patent of Hoxie and Reed and W. B. S. Taylor for improvements in flexible gas-tubing. To this tube, at each end, the usual coupling-tip *b* is attached.

For attaining the best results in insulation, I prefer to inclose the gas-tube within an elastic rubber tube, *c*, because this affords a good foundation for the insulated electric conductors B; but any other good insulating material may be employed instead of the rubber. The outside jacket *d* may be composed of any suitable fabric; but I prefer to use textile material, applied by means of a braiding-machine or a circular loom, as may be desired.

Near each end of the complex conductor the jacket *d* is sufficiently shorter than the rubber tube to permit the radial branching of the several electric conductors without contact with the tip.

It will be seen, when the cable is connected by its coupling to the elevator, and also by the several conductors with the several pins or studs which communicate with the annunciator, that the weight of the cable will be more or less equally divided between the gas-coupling and the wires, and that therefore neither will be unduly strained; also, that, the wires being located equidistant from each other on the periphery of the tube, and secured in that position, it is practically impossible for them to chafe, and thereby impair insulation. I sometimes secure these conductors in their proper relative positions by weaving them in straight on a circular loom, or by means of a cord tightly wound spirally, so as to embed them into the rubber; and sometimes I incorporate the electric conductors with strands of cord or twine in a braiding-machine, so that said conductors will be laid spirally around the gas-tube from end to end, equidistant from each other throughout.

The construction of my complex conductor can, of course, be largely varied without adding to or detracting from its value; and I do not limit myself to any particular construc-

tion, provided the cable as a whole possesses the characteristics and capacities described.

It will be seen that my complex cable or conductor may be made with much less material than would be required for making the gas-tube and electric cable separately, and it is consequently lighter, although much stronger, than either would be if made separately.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

A complex gas and electric conductor for elevators, composed of a flexible gas-tight tube and insulated electric conductors inclosed within a jacket, substantially as described.

EUGENE F. PHILLIPS.

Witnesses:
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