

(No Model.)

J. GRAIZIER.
CONDUIT FOR ELECTRIC LINES.

No. 559,701.

Patented May 5, 1896.

Fig. 2.

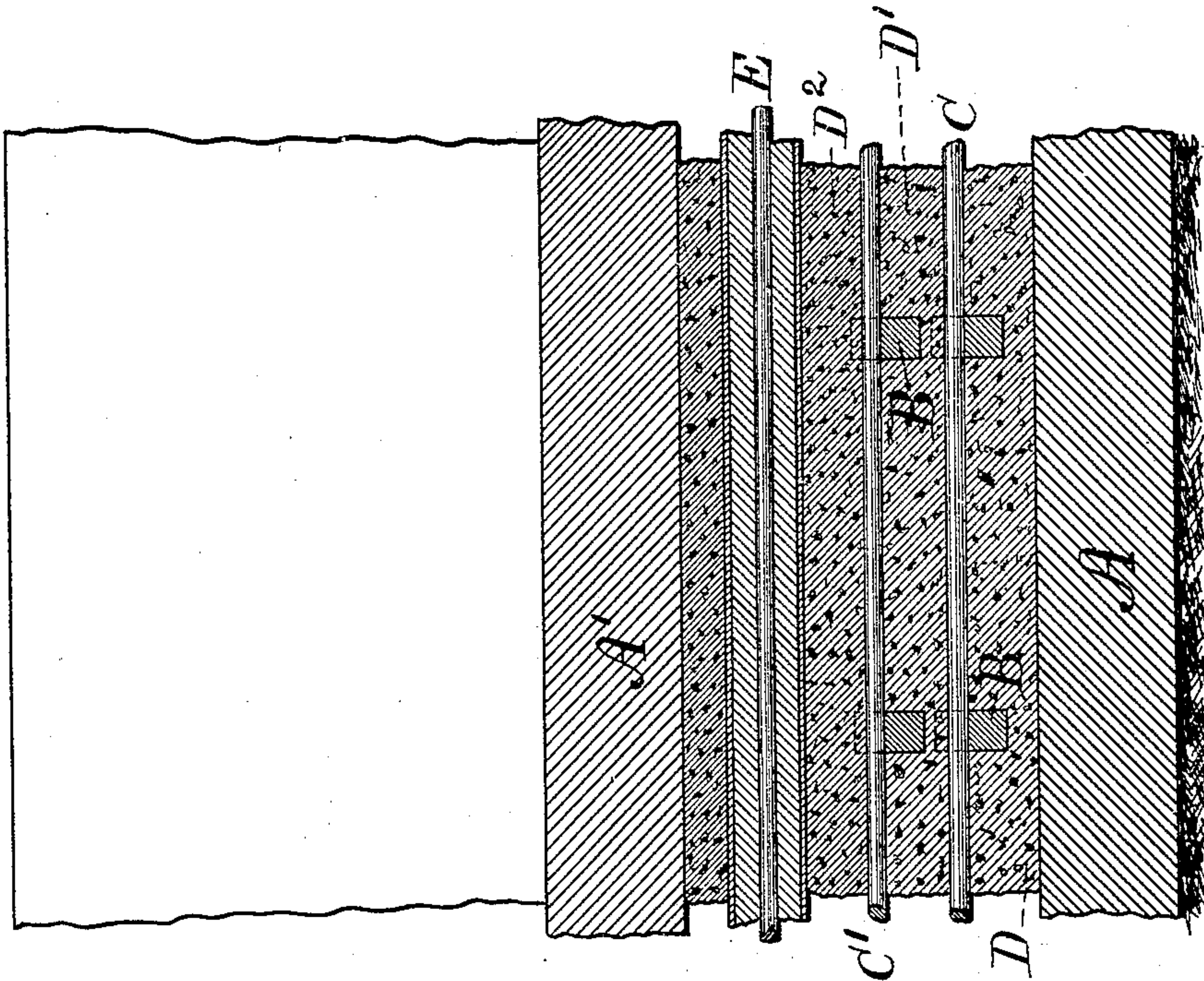
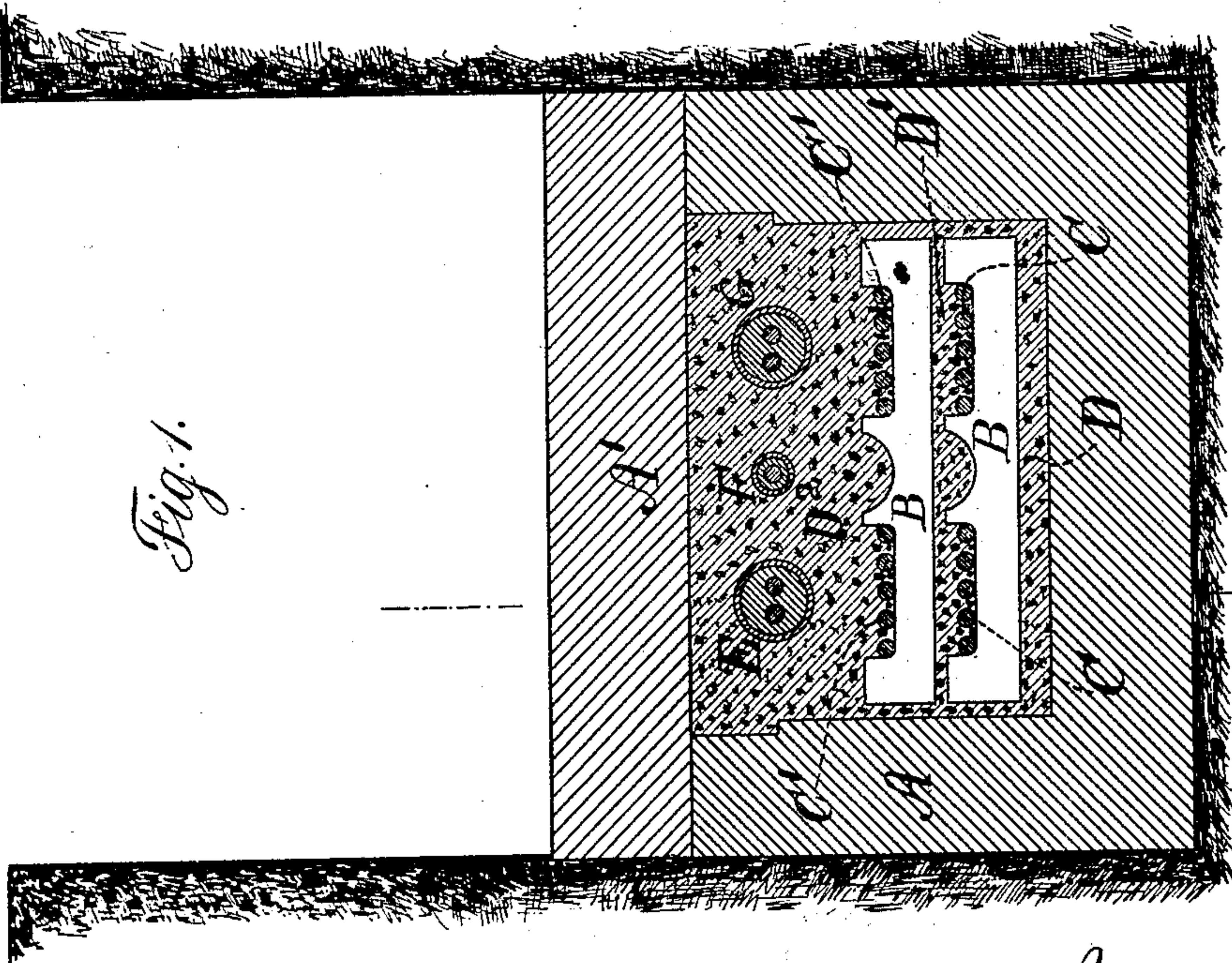


Fig. 1.



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UNITED STATES PATENT OFFICE.

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CONDUIT FOR ELECTRIC LINES.

SPECIFICATION forming part of Letters Patent No. 559,701, dated May 5, 1896.

Application filed November 4, 1895. Serial No. 567,787. (No model.)

To all whom it may concern:

Be it known that I, JEAN GRAIZIER, electrician, of Geneva, Switzerland, have invented certain new and useful Improvements in Electric Lines, of which the following is a specification.

Electric conductors have heretofore been placed in conduits or troughs underground, and in some instances resinous material, such as asphalt, tar, or paraffin, has been introduced into the conduit in a melted state around the conductors, and sometimes sand has been mixed in with such resinous material.

The present invention is for the purpose of preventing the conductors changing their positions within the conduit in consequence of the insulating compound becoming sufficiently soft to allow the conductors to settle therein by gravity.

In my present invention pebbles, pieces of broken china or glass, or other mineral non-conducting material are introduced into the conduit for the purpose of sustaining the wires and keeping them from approaching one another, regardless of the condition of the adhesive insulating material, such as resin, tar, or other non-conducting adhesive material that can be employed to fill up the interstices between the solid pieces that support the conductors.

In carrying out this invention a cement trough or conduit of any suitable size is provided, and into this pieces of mineral substances are introduced, together with the resinous material, and advantageously in a melted condition, and spread upon the bottom of the conduit to form a bed upon which the conductors are laid, and then a layer of the pieces of mineral and resinous materials is applied over the conductors and a second range of conductors laid in position. These conductors can be naked wires either laid close together or at suitable distances apart, and cross bearers or supports of porcelain or terra-cotta are placed at intervals in the layers of insulating materials for supporting and determining the positions of the conductors.

In the drawings, Figure 1 represents the present improvement by a cross-section of

the conduit and conductors with the section taken at the surfaces of the cross-bearers, showing them in elevation; and Fig. 2 represents a longitudinal section of a portion of the conduit.

I find it advantageous to employ pebbles, pieces of broken glass, china, or similar mineral substances of nearly uniform size and sufficiently large for the purpose of sustaining the wires, so that it is impossible for the conductors to approach each other by the softening of the adhesive material, and these pieces of mineral substances are heated to a sufficiently high temperature to drive off moisture, and then they are introduced into a suitable caldron or heating-pot with asphalt, tar, resin, or analogous insulating material in a melted condition, and the materials are thoroughly stirred together so as to form a uniform mass, and by employing as large a proportion of pieces of mineral matter as can be conveniently handled the expense of the insulation will be lessened, and a layer of this insulating material is to be placed in the trough or receptacle.

I have shown a trough A, of concrete or similar material, as receiving a bottom layer of such insulating material at D and a lower layer of conductors C upon the top of this layer D, which conductors may be in groups, as represented, or may be spread at suitable distances apart, and a second layer of the insulating material is applied at D', and upon the top of this a second layer of conductors is introduced at C', and these conductors are covered with a layer of insulating material D². In this manner any desired number of conductors may be introduced, and I have shown at B cross-bearers, which may be of terra-cotta, porcelain, or similar material, placed at suitable distances from each other in the layers D D' of insulating material along the line of conductors in the trough, and these will serve to group together or to separate the naked wires or conductors and to assist in supporting the same as they are laid in the trough or conduit. These cross-bearers should be coated with asphalt or similar material while hot, and are preferably made with recessed upper edges to receive the groups of conductors. If desired, groups of conductors

or wires may be introduced into this upper layer of material D², such conductors or wires being illustrated at E, F, and G, and they may be for telegraphs, telephones, or for any electrical devices, and a suitable cover may be added to the conduit, as illustrated at A'.

I do not claim inclosing naked wires in resinous material, as I am aware that the same has been employed and that the conductors have been in layers and supported separately within the conduit and surrounded by the resinous material in a melted condition.

I claim as my invention—

1. An insulating-conduit consisting of a trough of concrete and a cover therefor, a bottom layer of pieces of broken refractory insulating substances and bituminous material filling the interstices, and cross-bearers of terra-cotta or similar material having recessed upper edges and laid therein at intervals, longitudinal groups of conductors laid upon said layer of insulating material and within the recesses of said cross-bearers, and a second layer

of such insulating material above the conductors, substantially as set forth.

2. An insulating-conduit consisting of a trough of concrete and a cover therefor, a bottom layer of pieces of broken refractory insulating substances and bituminous material filling the interstices, and cross-bearers of terra-cotta or similar material having recessed upper edges and laid therein at intervals, longitudinal groups of conductors laid upon said layer of insulating material and within the recesses of said cross-bearers, and a top layer of insulating material above the groups of conductors, and covered conductors or wires, E, F, G within such top layer, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JEAN GRAIZIER.

Witnesses:

E. IMER SCHNEIDER,
OTTO H. MAY.