(No Model.) 2 Sheets—Sheet 1.

J. F. CUMMINGS.

UNDERGROUND CONDUIT.

No. 528,291. Patented Oct. 30, 1894.

Fig. 1.

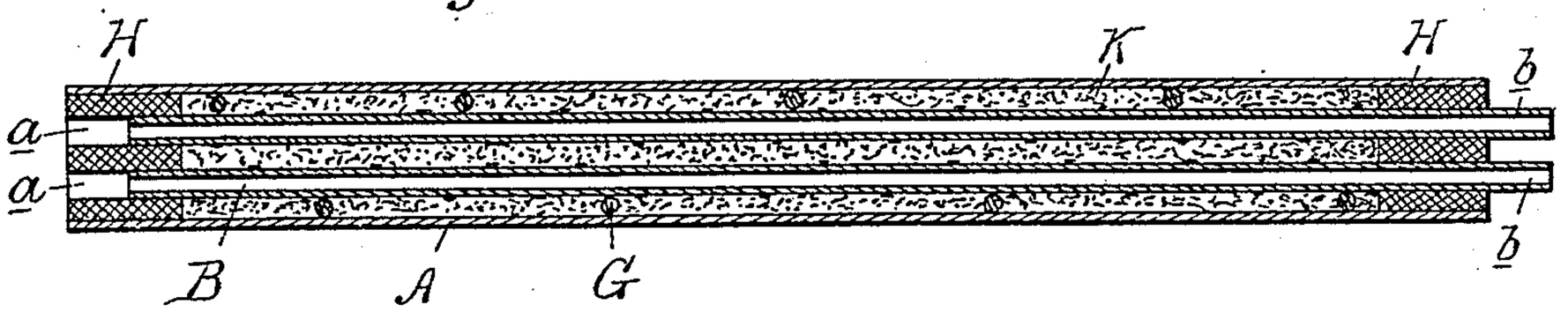


Fig. 2.

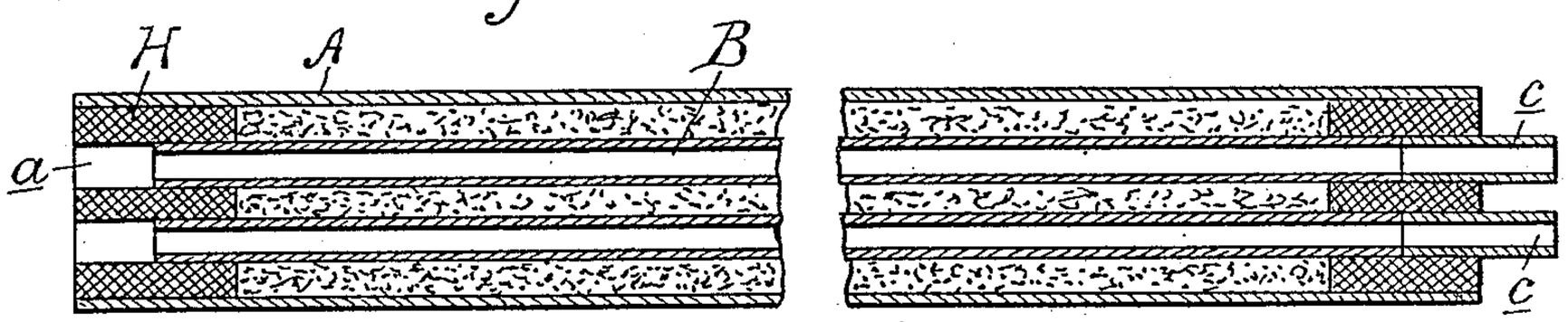


Fig. 6.

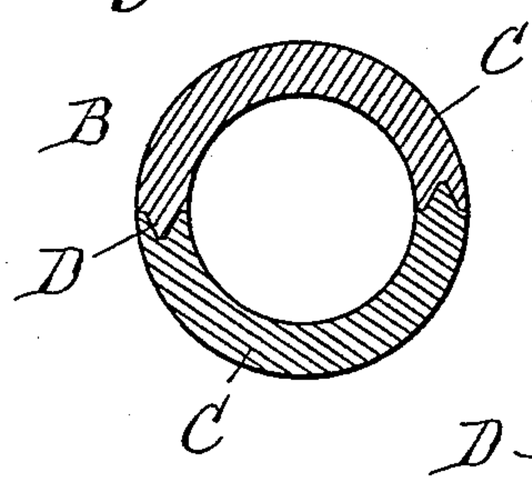


Fig. 7.

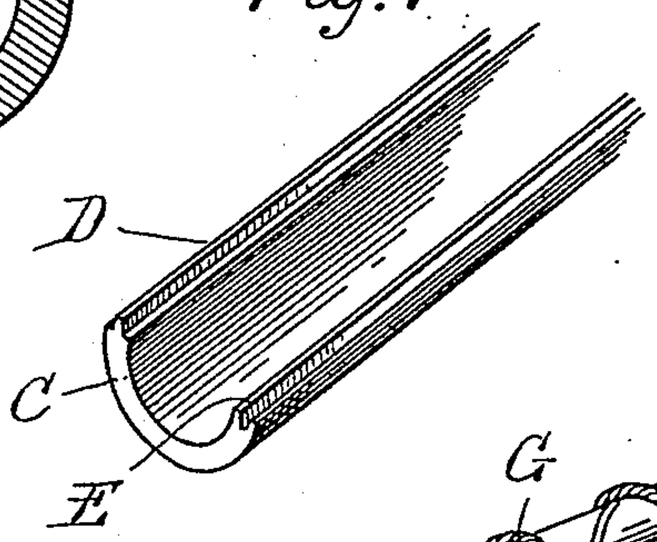
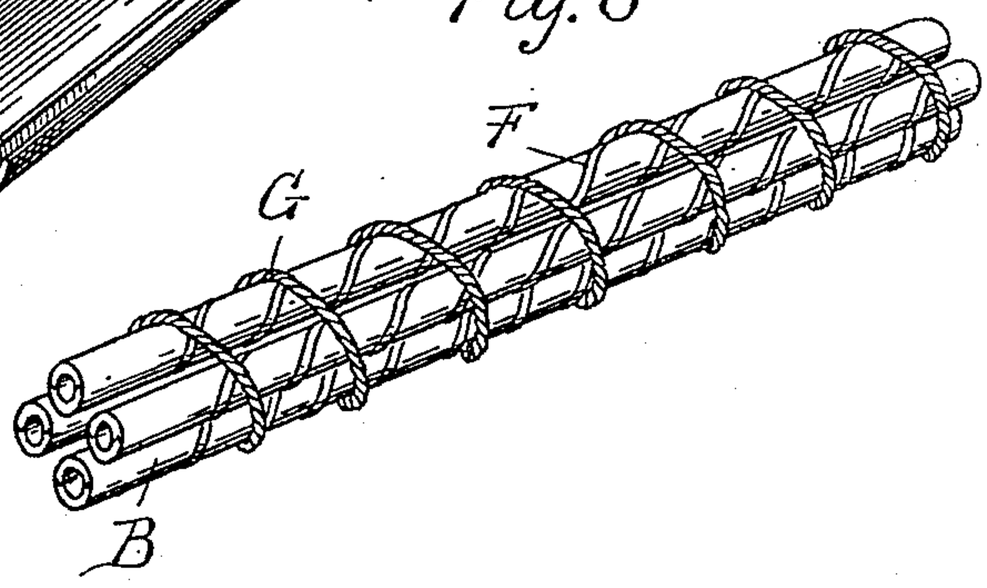


Fig. 8.



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

J. F. CUMMINGS.

UNDERGROUND CONDUIT.

No. 528,291. Patented Oct. 30, 1894.

Fig. 3

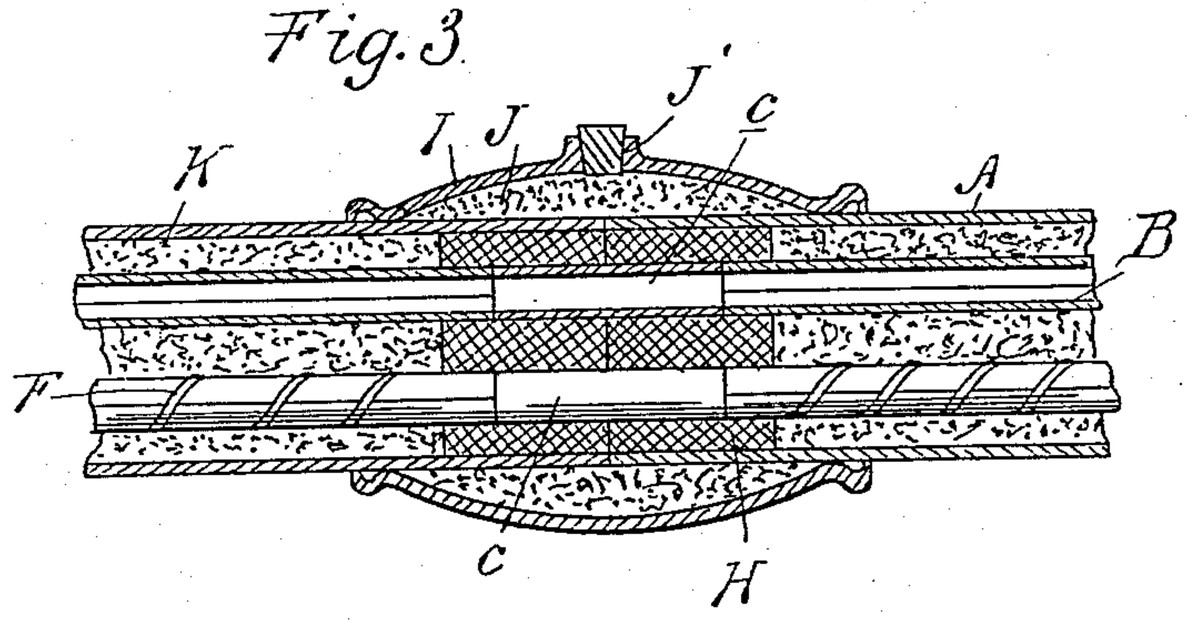


Fig. 4

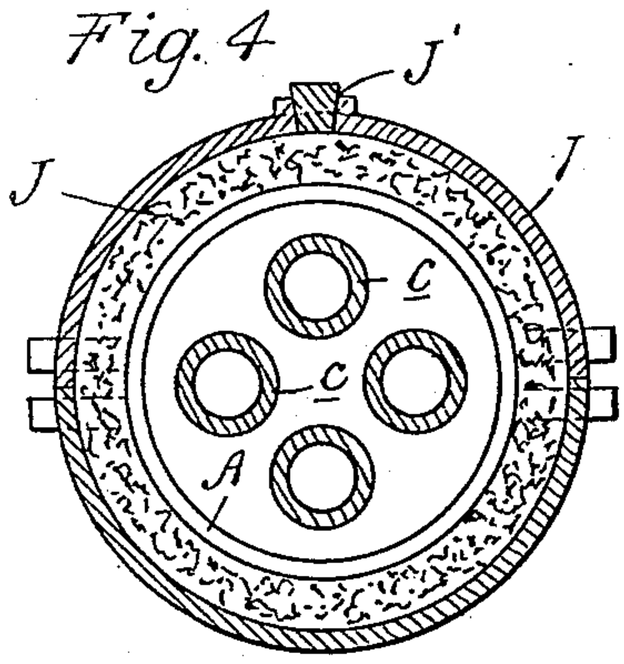
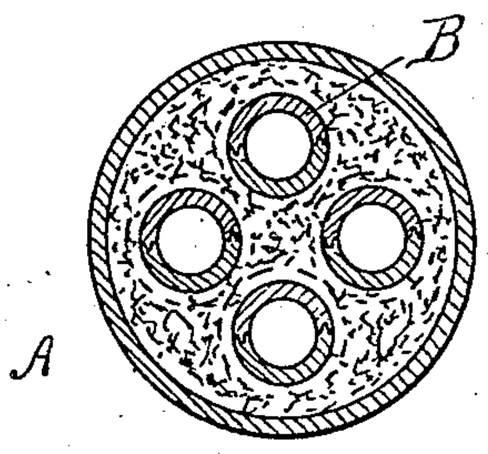


Fig. 5



Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES F. CUMMINGS, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO EUGENE M. ENGELMAN, OF MILWAUKEE, WISCONSIN.

UNDERGROUND CONDUIT.

SPECIFICATION forming part of Letters Patent No. 528,291, dated October 30, 1894.

Application filed January 16, 1894. Serial No. 497,093. (No model.)

To all whom it may concern:

Be it known, that I, JAMES F. CUMMINGS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Underground Conduits, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates mainly to the conductors of systems for the transmission of electric currents of high tension which are placed underground inclosed in tubular conduits joined together in sections and designed for the reception of one or more electric conductors.

The object of my invention is principally to obtain a high degree of insulation for such conductors in a manner that is not only simple and cheap but permanent, especially in regard to the joints which in all present constructions form a weak point through which the insulation is destroyed by moisture or gases finding a place of entrance at these joints. In devising my means for this object I have paid particular attention to make my construction especially adapted to expedite the laying of such conduits in the thoroughfares of a city.

To this end my invention consists of a conduit composed of sections formed of an outer casing inclosing as many wooden ducts as there are separate conductors, the wooden ducts being constructed moisture and air tight suitable for the reception of a naked conductor and insulated from each other and the outer tube by a dielectric surrounding and separating the ducts, also in the peculiar construction of the ends of the section whereby the same when connected form continuous outer and inner ducts in which the joints lap each other, all as more fully described hereinafter.

In the drawings, Figure 1 is a vertical, central longitudinal section of a conduit section as manufactured ready for use. Fig. 2 is a similar section showing a slight modification. Fig. 3 is a similar section through the meeting ends of two sections of my conduit, showing junction box, &c. Fig. 4 is a cross section centrally of the junction box. Fig. 5 is a cross section of the conduit section. Fig. 6 is an enlarged cross section of one of the ducts. Fig. 7 is a detached perspective view of one half of a duct. Fig. 8 is a perspective view of a bundle of the duct assembled for insertion into the casing.

I preferably manufacture my conduit in sections, such as shown in Fig. 1, each duct being of the construction shown in Figs. 6 and 7, and assembled as shown in Fig. 8.

A is a conduct casing, preferably a metallic pipe within which I place the ducts B. These ducts I make of two like semi-cylindrical halves C, having a longitudinal tenon D, formed centrally on one edge, and a corresponding groove E on the other edge. This tenon and groove I preferably make tapering as shown, to insure perfect centering and tight joints between the halves of the duct. By making the ducts in two like halves a single machine and a single operation will shape them: while if the tenons were both on one piece and the grooves both on the other, two machines and two operations would be required, and they would need to be "paired" in shipping. With my construction all this is obviated.

The duct is formed by bringing two like sections together with the tenons engaging in grooves, and the two bound together to form a tube, by the spirally wound tape F. The ducts thus formed are preferably centered in the casing by means of a spirally arranged cord or rope G of sufficient size to fill the space between the ducts and casing, leaving a short space at each end of the ducts free from such spacing means; the space at one end being preferably longer than the space at the other end for purposes hereinafter set forth.

At each end of the outer casing I insert a block or plug H apertured to receive the ends of the ducts. The ducts are preferably secured in these blocks as shown in Fig. 1 leaving sockets *a* at one end and projecting at the other end with tongues *b* so that when two sections are brought together the projecting tongues formed by the extension of the ducts of one section will enter the sockets in the other section. Instead of doing this both ends of the section may be engaged into the inner ends of the sockets of the plugs only as

shown in Fig. 2 and bridge pieces *c* may be employed at one end, which being inserted into the sockets to abut against the end of the duct will project out and form the tongues.

When the two sections are brought together any suitable junction boxes may be employed, such for instance as shown in Fig. 3, in which I have shown an outer casing I clamped about the joint with a filling of non-conducting material, such as asphaltum J filled through a plugged hole J′ therein.

Asphaltum or other non-conducting material is preferably placed in the space K around the ducts. This construction of joint makes it almost impossible for any moisture to enter the duct as even if it should enter at the joint at the end of the casing it would still have to travel laterally some distance to pass through the joint between the bridge section and the end of the duct in order to enter beyond this. The passing of one section of duct into the block in the adjoining section of the conduit materially strengthens the conduit at the joint and prevents damage by heaving or settling of the ground.

The sections of which the ducts are formed I preferably boil in oil or otherwise treat to prevent rotting.

What I claim as my invention is—

1 In an underground conduit for electrical conductors, the combination of a casing, apertured blocks at the end of the casing, ducts supported at opposite ends in the apertures of the blocks, and having extensions projecting beyond the blocks and the opposite ends being correspondingly retracted from the end, substantially as described.

2 In an underground conduit for electrical conductors, the combination of the casing, apertured blocks at the end of the casing, ducts having their end portions supported in the blocks, insulating material filled around the ducts within the casing and sections of ducts spanning the joint between adjoining sections, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES F. CUMMINGS.

Witnesses:
M. B. O'DOGHERTY,
O. F. BARTHEL.