

(No Model.)

2 Sheets—Sheet 1.

J. F. MUNSIE.
UNDERGROUND ELECTRIC CONDUIT.

No. 470,946.

Patented Mar. 15, 1892.

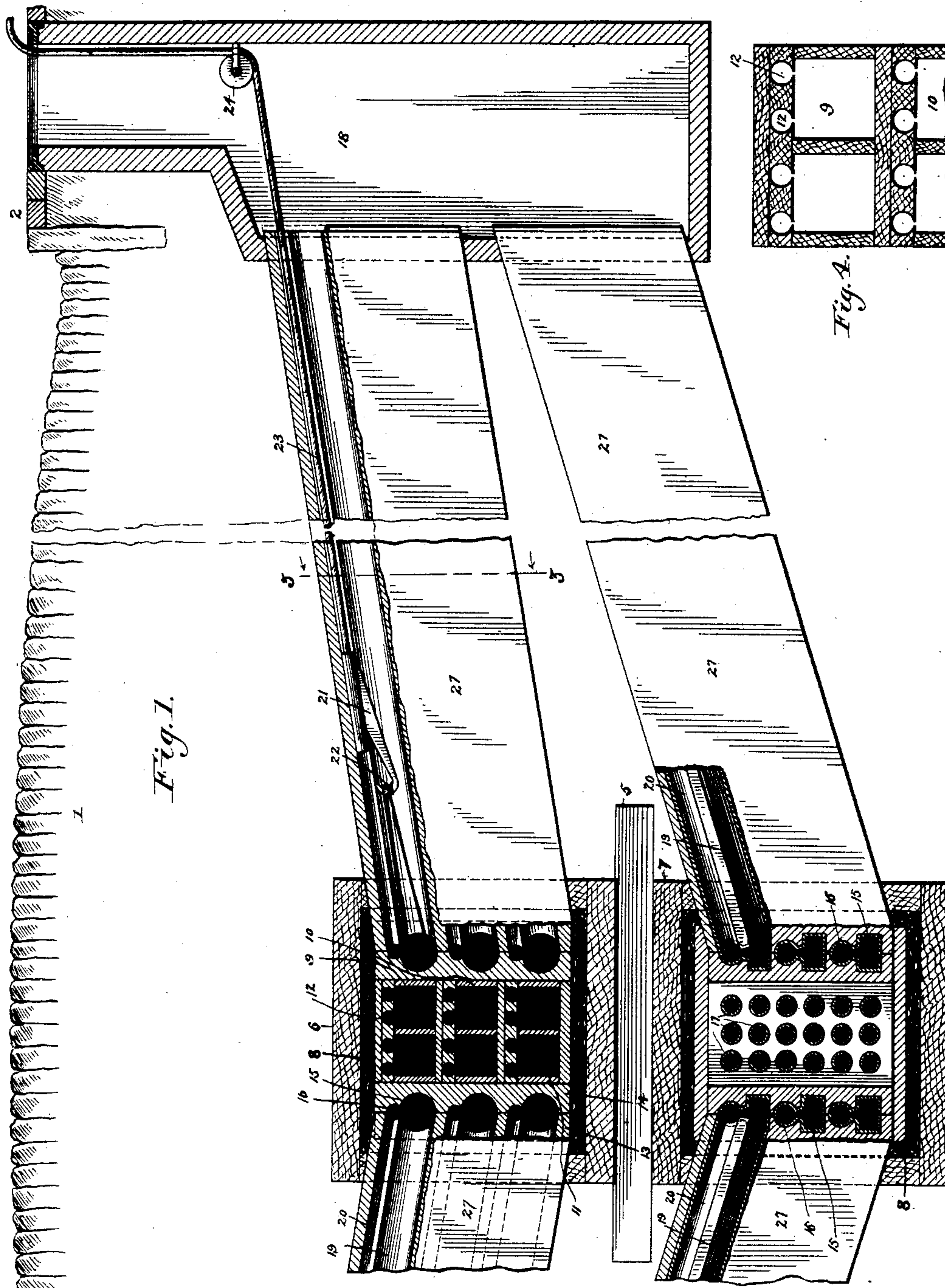


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses

H. W. Elmore,

W. L. Hillyer.

Inventor
James F. Munsie.

by
Pennie & Goldborough
Attorneys.

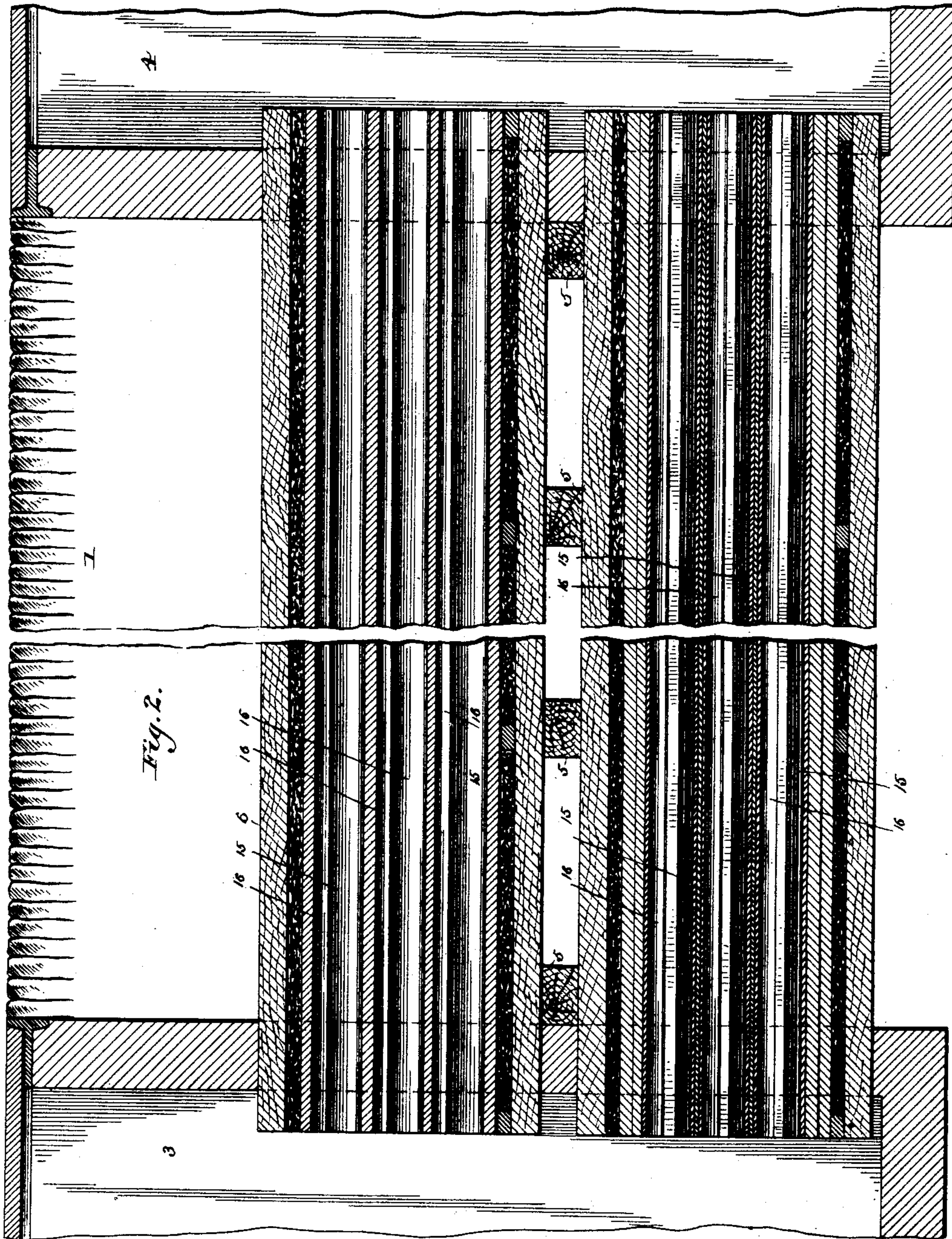
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James F. Munsie.

by
Cunie & Goldborough,
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES F. MUNSIE, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THOMAS
LEONARD COLES, OF NEW YORK, N. Y.

UNDERGROUND ELECTRIC CONDUIT.

SPECIFICATION forming part of Letters Patent No. 470,946, dated March 15, 1892.

Application filed October 9, 1889. Serial No. 326,440. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. MUNSIE, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Underground Electrical Conduits; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to underground-conduit systems for electrical conductors, and is designed particularly to furnish a construction and arrangement of parts whereby distribution from the main or through conduit to the dwellings or other points between man-holes may be effected after the completed system is laid without removing or tearing up the roadway and with great ease and celerity, the entire system being of a permanent and enduring character, the through-conduit being absolutely closed between man-holes, and the general distributing-ducts being devoid of hand-holes and communicating with the dwellings only through the service-ducts thereto. The opposite ends of the through-conduit sections and of the general distributing-ducts and the outer ends of the service-ducts being normally securely closed against access of moisture from the man-holes and the closing-plates for said ends being protected from molestation and out of possible accidental contact with persons or animals using the roadway, while at the same time readily accessible to the line-workmen, a construction is presented realizing the following advantages: first, complete isolation of the wires within the through-conduit sections, the distributing-ducts, and the service-ducts from the soil and its moisture at all times; secondly, the capability of transferring wires from the through-conduit to any of the general distributing-ducts and thence into and through any of the service-ducts to the localities to be supplied without in any way interfering with the road-bed; thirdly, the capability of withdrawing any service-wire when no longer in use from the service-duct and the general distributing-duct corresponding thereto and replacing said wire in the through-

conduit or transferring it to another service-duct, the manipulation, as before, being effected without breaking up the road-bed; fourthly, dispensing entirely with distributing-duct hand-holes in the roadway between the man-holes, thereby removing a fruitful source of danger, and, fifthly, enabling the service-wires to be manipulated from the curb-stone, so as not to interfere with vehicle traffic upon the street, an important consideration in crowded thoroughfares.

It is also incident to my invention, as hereinafter explained, that it enables me to pass a wire from the main conduit entirely through the service-duct to the locality to be supplied without the necessity of making a splice-joint in said wire at the point of juncture of the general distributing-duct and the service-duct.

In the accompanying drawings, Figure 1 represents in cross-section an underground electrical conduit embodying my invention, and Fig. 2 represents a longitudinal section thereof. Fig. 3 represents a section on the line 3 3 of Fig. 1.

Similar numerals of reference indicate similar parts in all the views.

Referring to the drawings, 1 indicates the road-bed, and 2 the sidewalk, of a street, the relative width of the road-bed with respect to the electrical conduit being in most instances considerably greater than that actually shown in the drawings, as indicated by the broken lines in Fig. 1. In Fig. 2 the distances between the conduit man-holes 3 4 are in like manner shown comparatively shorter.

The main body of the underground conduit is laid in a trench at a suitable distance below the road-bed to be protected against the influence of frost and from shocks or jars from heavily-laden vehicles. It consists of a series of successive sections independent of each other, each section extending between two man-holes and the wires being connected between the sections to constitute a through system. One of these conduit-sections is illustrated in the drawings, which shows a construction adapted to receive and distribute wires for both high and low tension currents.

For convenience I prefer to locate the high-tension wires (for electric lighting, transmis-

sion of power, and the like) at the bottom of the trench and within the compartment 7, reserving the upper compartment 6 for the reception of telephone and telegraph wires and other wires charged from batteries. This relative arrangement effects the double purpose of placing the high-tension wires at the greater depth, where they are less liable to be disturbed by surface-digging, and also of giving easier access to the battery-wires, which are in general the more numerous and require the more handling. The bottom of the upper compartment is preferably separated from the top of the lower compartment by intermediate wooden supports 5 to effect complete insulation between the two.

Each compartment referred to consists, primarily, of a well-made outer casing or shell of wood, preferably soaked in a water-proof preservative solution, and extending uninterruptedly with integral walls and tight joints between adjacent manholes, as 34. The outer shell is in each instance separated from the inner conduit containing the wires by an intervening filling 8 of insulating water-proof material—such as tar, mineral paint, or the like—preferably poured into the space allotted to it in a liquid condition and then allowed to solidify.

The "through" wires of the upper compartment 6 are located within the chambers 9 10 11, and may be introduced therein by means of the supplementary channels 12 and the hauling-through cable and its accessories shown in Letters Patent No. 356,152, granted to me January 18, 1887. To economize space and material, I form the said supplementary channels in the under side of the partitions separating the chambers. The sides of the said chambers are formed by the general distributing-ducts, consisting each of two similar parts 13 14, suitably grooved or reamed out to form main ducts 15 and supplemental channels 16, communicating therewith through-out in the same manner as the channels 12 communicate with the chambers 9 10 11 and for a similar purpose—namely, the introduction of wires therein from the man-holes 3 4 therein by means of hauling-through cables.

In the lower compartment 7 of the conduit the through-wires are located within a series of tubes 17 of insulating material, said tubes being jointed together and extending continuously between adjacent man-holes. The wires may be readily introduced into the tubes by the feeding apparatus described in my application for Letters Patent filed May 11, 1889. The general distribution-ducts 15 and their supplemental channels 16 are similar in construction to those of the compartments 6, the only difference being in the cross-section of the ducts, as shown.

It will be noted that in both compartments 6 and 7 the general distribution-ducts are located at opposite sides of the through-wire ducts. This arrangement permits the wires to be readily supplied to either side of the

street, and also enables a shallower trench to be used than if the general distributing-ducts were located above or beneath the through-wire ducts. From the general distributing-ducts of both compartments extend laterally the service-ducts 27, which lead to man-holes, as 18, in front of the dwellings on each side of the street.

The service-ducts consist of main passages 19 and longitudinal supplemental channels 20, communicating therewith.

The wires are drawn into and through the service-ducts by means of the sliding hooked piece 21, provided at its end with the friction-roller 22, and adapted to be inserted so as to grasp the wire, as indicated in Fig. 1, and as fully described in an application filed by me May 8, 1889, Serial No. 310,033.

The stout flexible wire 23, whereby the sliding piece is pushed into the channel 20 and withdrawn therefrom, may conveniently be fed from a reel and passed behind a friction guide-roller 24, supported from the rear wall of the man-hole. After being drawn into the said man-holes the conduit-wires may be connected in any suitable manner to the house-circuits.

It will of course be understood that I contemplate laying the entire conduit system with its distributing-ducts and service-ducts at one operation, so that it will not be necessary thereafter to disturb the roadway in any way when running into the dwellings along the same new service-wires or inserting additional through-wires into the main-conduit sections. The system being once laid, the mode of using the same for the accomplishment of these results will be clearly apparent. Thus to introduce new through-wires in any particular section the man-holes 3 and 4 are opened for the descent of the workmen and the wires are then drawn through by the hauling-through cable or fed through by the feeding-roller device, as hereinbefore explained. The hauling-through cable is also used for withdrawing wires from the main conduit and inserting them into the general distributing-ducts, and, finally, the the wires from the general distributing-ducts are, when required, withdrawn into the service-ducts of any particular dwelling in the manner referred to, so as to be supplied to said dwelling. All of these manipulations may be effected with great celerity and with a minimum outlay of labor and expense. The main body of the conduit and the general distributing-ducts, and likewise the service-ducts, are absolutely without any opening, except at their ends, which open into man-holes capable of being securely closed and hermetically sealed, but which are readily accessible to the line-workmen.

What I claim is—

1. An underground electric-conduit system consisting of a through-wire conduit, distributing-ducts extending along said conduit, and service-ducts leading transversely from the

5 distributing-ducts, the through-wire conduit
and distributing-ducts being divided up into
sections by man-holes spaced at intervals
along the line and the service-ducts being pro-
vided with man-holes at their ends remote from
the main conduit, and devices, substantially
as described, whereby the wire may be with-
drawn from the main conduit through the
service-ducts, substantially as and for the pur-
poses set forth.

2. In an underground electric-conduit sys-
tem, the combination, with a distributing-duct
accessible or open at its ends and a service-
pipe leading transversely from the distribut-
ing-duct, the service-pipe being open or ac-
cessible at its end remote from the main con-
duit, and a grappling device for withdrawing
wires from the distributing-duct through the
service-pipe, substantially as described.

3. In an underground electric-conduit sys-

tem, the compartment 6, provided with a se-
ries of horizontal partitions, said partitions
having longitudinal channels formed in their
under surfaces, substantially as and for the
purposes set forth.

4. In an underground electric-conduit sys-
tem, the combined through-wire and distrib-
uting-duct compartment consisting of an outer
casing, an inner insulating-packing, and an
inner conduit adapted to contain the through-
wires and whose side walls are formed by the
distributing-ducts, substantially as and for
the purposes set forth.

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

JAMES F. MUNSIE.

Witnesses:

JOHN C. PENNIE,

J. A. GOLDSBOROUGH.