

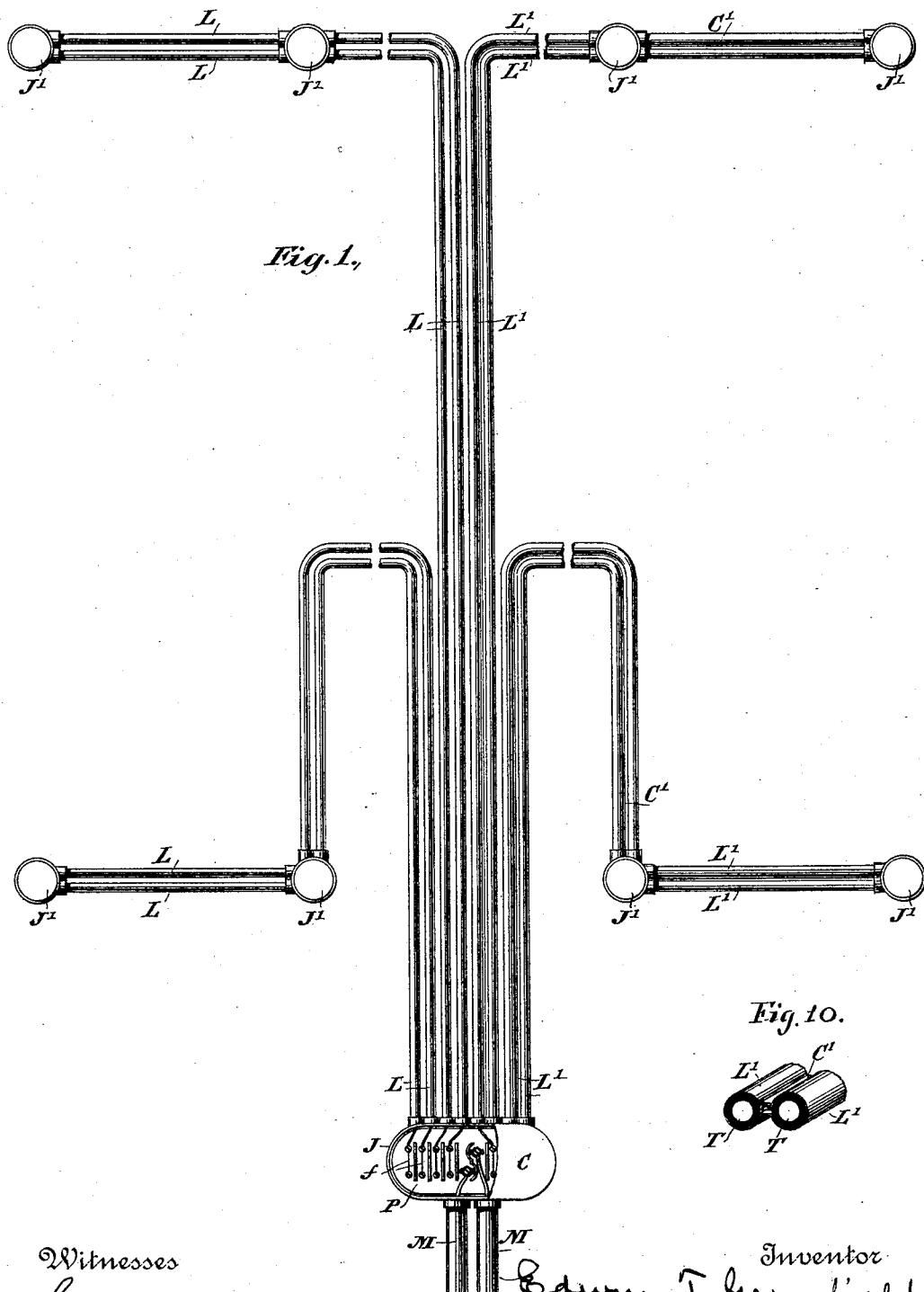
(No Model.)

3 Sheets—Sheet 1.

E. T. GREENFIELD.
ELECTRICAL CONDUIT.

No. 469,208.

Patented Feb. 16, 1892.



Witnesses
Geo. W. Brock
Edward Thorpe

Inventor
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By his Attorney
Charles J. Kintner

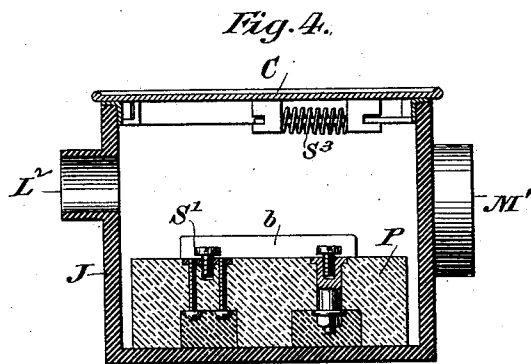
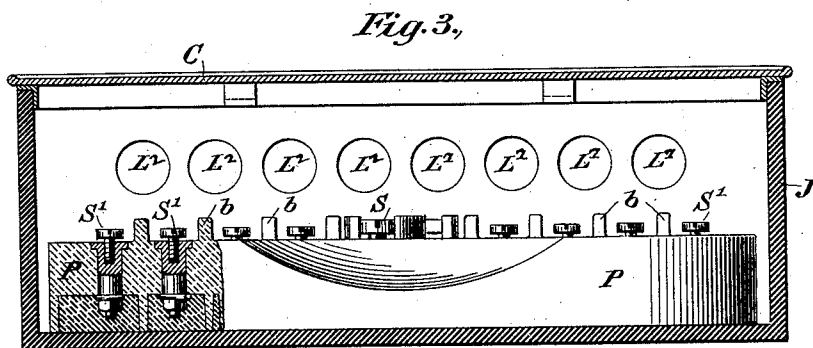
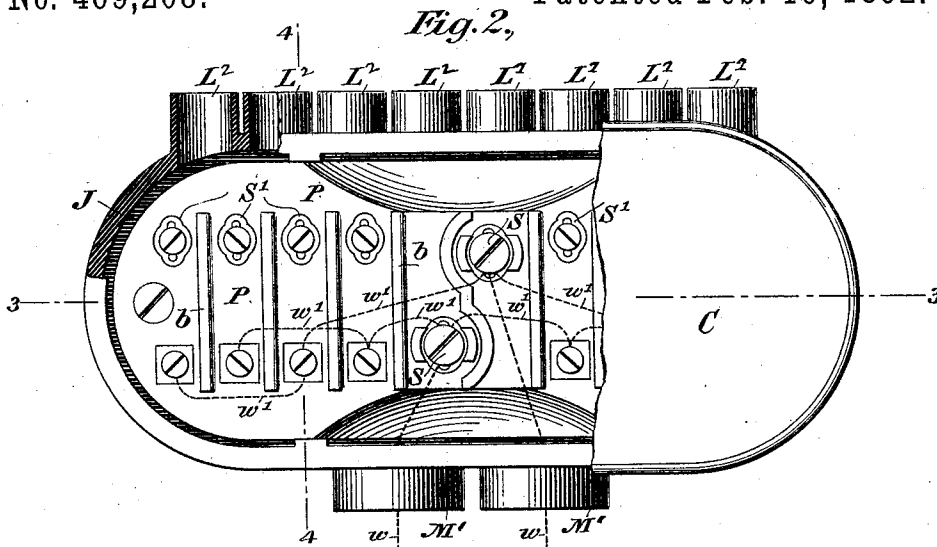
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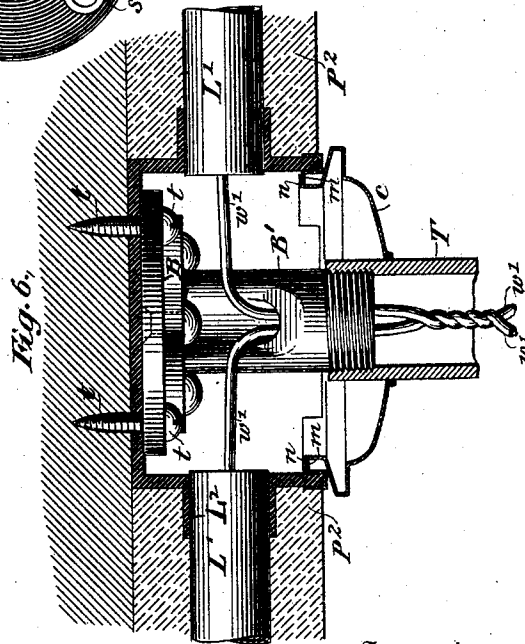
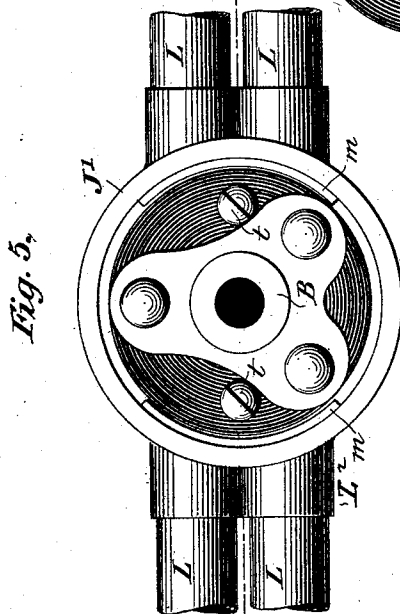
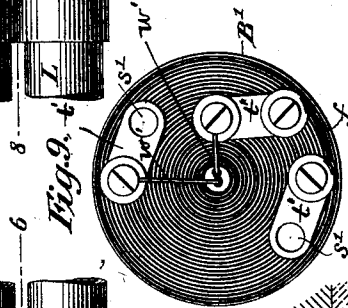
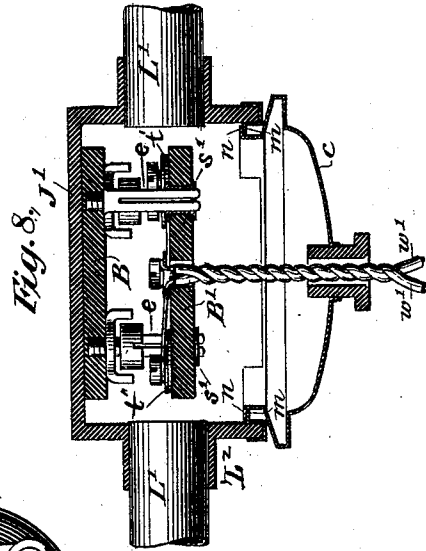
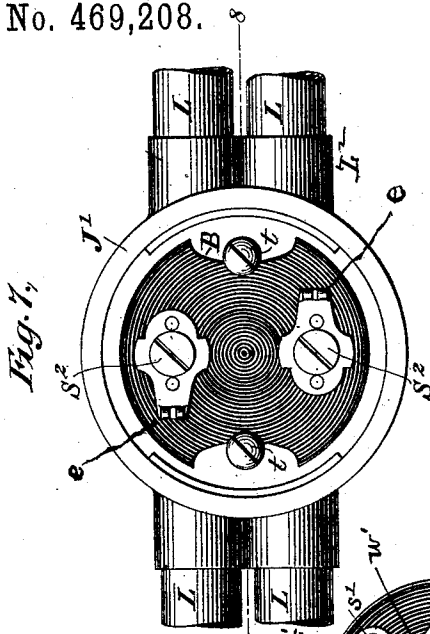
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

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ELECTRICAL CONDUIT.

SPECIFICATION forming part of Letters Patent No. 469,208, dated February 16, 1892.

Application filed May 13, 1891. Serial No. 392,590. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at New York, county and State of New York, have made a new and useful Invention in Systems of Electrical Conduits, of which the following is a specification:

My invention is directed particularly to improvements in systems of interior or house conduits and fixtures and appurtenances in connection therewith; and it has for its objects, first, the construction of a system of such conduits as will give to electrical conductors laid or inclosed therein absolute security from the usual accidents to which such conductors are subjected in buildings, subterranean passages, and analogous places; second, the production of a conduit-tube which shall be rendered secure against the attacks of moisture, acids, alkalies, and vermin; third, the arrangement of junction-boxes in connection with said system of conduit-tubes in such manner as to afford easy access and convenient manipulation of the conductors and fixture attachments in connection therewith; fourth, the general arrangement of parts hereinafter described, and particularly pointed out in the claims which follow this specification.

Systems of interior or house conduits have heretofore been devised consisting of individual tubes or pipes running from central points of distribution to outlying points—such, for instance, as the various floors of a building—and subordinate junction-boxes have been located at such outlying points for facilitating the attachment of fixtures. Such systems of conduits, however, embodied the idea of carrying the direct and return conductors in the same conduit-tube.

The present invention differs from the aforesaid systems in that I utilize double tubes running from central points of distribution to various points of usage and supply subordinate junction-boxes, the direct conductor being located in one tube and the return-conductor in the other, thereby affording more absolute insulation between the said conductors than is had from inclosing them in a single tube.

My invention will be fully understood by referring to the accompanying drawings, taken

in connection with the following specification, in all of which drawings like letters of reference represent like parts wherever used.

Figure 1 of the drawings represents a diagrammatic or plan view of my improved system of interior or house conduits in connection with a main junction-box and subordinate or user's junction-boxes for fixture attachments. Fig. 2 is a plan view of one of my improved junction-boxes, partly in section, and showing the top thereof broken away in order to better illustrate the interior construction thereof. Fig. 3 is a longitudinal sectional view of said junction-box, taken on line 3 3, Fig. 2. Fig. 4 is a cross-sectional view taken on line 4 4, Fig. 2, and as seen looking at Fig. 2 from left to right. Fig. 5 is a plan view of a subordinate junction-box, showing its connection with the interior or conduit tubes; and Fig. 6 is a part sectional, part elevational view of the same. Fig. 7 is a plan view of a modified form of the interior attachments of this subordinate junction-box, and Fig. 8 is a sectional elevational view thereof. Fig. 9 is a plan view of the interior portion of the electrical connections of the lower portion of the junction-fixture as seen looking down upon it, Fig. 8. Fig. 10 is a short perspective view showing my preferred form of double tubing, in which the two tubes are held together by a metal covering.

Referring now to the drawings in detail, M M, Fig. 1, represent a pair of feeder-conduit tubes entering a building from the street mains, and J a main or distribution junction-box connected thereto, such as is shown in Figs. 2, 3, and 4 in enlarged view, said junction-box being located in the wall or at any desired point, with its cover C on substantially the same level as the face of the wall, the conduit-tubes M M being also located in the wall, while L and L' are interior or branch conduit-tubes running from the opposite side thereof to different floors of the building, the lower set L L' L' L' being located upon one floor of the building, while the upper set L L' L' L' run to another floor of the same building, the idea being to run these double tubes L L' L' L' from some central point of distribution to the various portions of the building.

J' J' J' represent the subordinate junction-

boxes, which are secured by screws, as shown in enlarged view in Figs. 5 and 6, to the wall or ceiling and are provided with removable caps *c c*, as clearly shown in Figs. 6 and 8.

5 In Fig. 10 I have shown my preferred form of double tube, in which the interior tubes *T* may be and are preferably made of prepared paper and treated with insulating material in accordance with well-known processes and are
10 then united by a surrounding metallic shield or tube *C'*, made of brass, sheet metal, lead, or any pliable metal which may be folded closely around the tubes and united by a central web, as shown. The material of which
15 this outer metallic tube *C'* is constructed is prepared of the necessary width for inclosing the two tubes *T T* side by side, and said tubes are laid thereon, and they, together with the strip of metal, run through a folding or forming
20 die, which folds it over them in the manner shown, closely uniting them by an intervening web. This protecting shield or outer tube may be thus placed about the parallel tubes *T T* by hand or by a forming-die, or in
25 any preferred manner.

In Fig. 1 I have shown all of that set of tubes located on the right of the drawings and indicated by *L' L'* as of this double-tube type united by the metallic shield *C'*, (shown in
30 Fig. 11,) and this, as I have above indicated, is my preferred form of tubing, inasmuch as the metallic shield *C'* not only joins the tubes together, whereby they may be transported as a single tube, but protects them alike from
35 the attacks of fire, alkalies, accidents, and vermin, and at the same time prevents any evil effects which might result from a short circuit between the electrical conductors located in each tube, where they are separated
40 by a short space, and this feature I deem as of very great importance.

Referring now to Figs. 2 and 3 for a correct understanding of the circuit connections of the main junction or distribution boxes, the
45 conductors *w w* from the leads enter said junction-boxes and are united to binding-screws *S S*, secured to a porcelain base *P*, provided with elevated ribs *b b*, the function of said ribs being to separate the individual con-
50 ductors electrically and to afford a secure location for the fusible cut-outs *f f* with their binding-screw connections *S' S'*, (see Figs. 1, 2, and 3,) the binding-screws being secured in metallic plugs or plates, as shown in Figs.
55 3 and 4, or in any other preferred manner.

It will be seen upon examination of Figs. 1 and 2 that the various branch connections running to the conductors located in the conduits *L L L' L'* are connected in multiple arc
60 with the leads *w w*, and that one conductor *w'* passes up through one of the tubes *L* to the junction-boxes *J' J'*, while the other conductor from the other main passes up through the next parallel tube to and through the
65 same subordinate junction-boxes.

C represents the cover of the main junction-box provided with fixed locking-lugs on one

side and spring-actuated locking-lugs on the other having a spiral spring *S³*, adapted to readily permit the removal of said cover. 70 This cover *C* is provided with one or more fixed lugs on its under side at one edge, adapted to hook under a ledge near the upper part of the junction-box, and one or more pairs of sliding lugs on its other lower edge, provided
75 with spiral springs *s³*, adapted to force the sliding lugs under the ledge, as clearly shown in Fig. 4. In order to lock the cover in position after it has been removed, it is placed with a sliding lug or lugs under the edge of
80 the ledge and pressed to the right, as seen looking at Fig. 4, thus causing the sliding lug or lugs to compress the spring or springs *s³*. After it has reached a point which will permit the lug or lugs on the other side to as-
85 sume the position shown it is released, thereby allowing the spring *s³* to force it into the locked position shown. This feature of a removable locking-cover is fully disclosed and claimed in a prior application filed by me in
90 the United States Patent Office on the 6th day of December, 1890, bearing Serial No. 373,741, and I make no claim in the present application to this special form of locking-
95 cover.

M' and *L²* are short projecting sleeves integral with the body of the boxes *J*, the function of said sleeves being to facilitate the union of the tubes *M M L L'* with said boxes. The subordinate boxes *J' J'* are provided with
100 similar short projecting sleeves, as shown in Figs. 5, 6, 7, and 8. The tubes are inserted in these sleeves and cemented thereto in a manner at once obvious to those skilled in the art. These short sleeves may be on the inside of
105 the boxes, if preferred.

Referring now to Figs. 5, 6, 7, 8, and 9, wherein are shown the individual features of the subordinate junction-boxes, *L L* represent, as already indicated, the branch conduit-tubes,
110 located in the ceiling or in the wall, the plastering *P²*, or in any preferred concealed location, joined to the boxes, as shown, and *J'* is the junction-box, secured to the wall of the building by screws *t t*. These junction-boxes
115 are provided with metallic caps *c c*, having locking or bayonet joints *m*, adapted to lock with corresponding joints *n* on their inner edges.

In the form shown in Figs. 5, 6, 7, and 8, *B* 120 is an insulating-washer, made of vegetable fiber, prepared paper, or other analogous insulating material, secured to the ceiling or wall by screws *t t*, and *B'* represents a removable fixture-support, that shown in Fig. 5 being screw-threaded at its lower end and hav-
125 ing attached to it, as shown, a chandelier or fixture-tube *T*. It is hollow and provided with an opening on one side to admit of the insertion of the wires *w' w'*, running to the lamp
130 on the fixture. (Not shown.) After the fixture-tube *T* is screwed in place the cap *c* is locked in position, as shown.

In the junction-boxes shown in Figs. 7 and

8 the connections are adapted for the attachment of a lamp, which is supported directly by the insulated flexible conductors $w' w'$, and this form of attachment is made interchangeable with that shown in Figs 5 and 6 in the same subordinate junction-boxes by substituting for the insulating-block B in Fig. 6 a similar insulating-block B, notched at its sides, as shown, so that the heads of the screws $t t$ secure it in the position shown. On the under side of this insulating-block B are secured by a pair of binding-screws $s^2 s^2$ two angular split conducting-arms $e e$, the screws s^2 acting as binding-screws for the in-leading wires from the conduit-tubes $LLL' L'$, the upturned angular split ends being adapted to project through metallic sleeves $s' s'$, secured in a second removable insulating-block B' of substantially the same diameter of the first-named block B. These sleeves $s' s'$ are connected on their upper side to conducting-plates $t' t'$, which in turn are connected by screws and fusible cut-outs $f f$, so that when the parts are in the position shown in Fig. 8 the circuit is completed from the branch wires through the flexible conductors $w' w'$ to the suspended lamp. (Not shown.) It will thus be clearly understood that the subordinate junction-boxes $J' J'$, provided with their removable caps $c c$, are equally well adapted for sustaining a chandelier-fixture from the tube T and support B', as shown in Figs. 5 and 6, or a single lamp supported by the flexible conductors $w' w'$, passing through a tubular guide in the center of the cap c and sustained by the insulating-blocks B' and B, and that the cap c may be readily and quickly removed, the fusible cut-outs $f f$ replaced when destroyed, and the in-leading wires easily manipulated.

I do not limit myself to the specific details of construction herein described and shown for accomplishing the several features enumerated, as I believe it is broadly new with me to provide a double set of tubes for protecting advance and return conductors joined to one or more lamps or equivalent translating devices, and also that it is new with me to combine such a system of tubes with one or more distribution-boxes, and that it is broadly new with me to devise a subordinate junction-box with interchangeable devices for adapting the same to a rigid fixture or to a flexible suspending device, and my claims hereinafter made are designed to cover, broadly, these features.

I am aware that it is old in the art to combine the advance and the return conductors in a solid mass of insulating material in a single tube or in two tubes in effect in such manner that the conductors are not removable therefrom, except by taking up the tubes and the conductors jointly, or, in other words, by removing the conduit-tube and its inclosed conductor, and my claims, hereinafter made, are not designed to be of such scope as to include such a construction; but they are directed, broadly, to the combination of double tubes with removable insulated conductors located therein, the advance conductor being located in one tube or pipe and the return-conductor in the other.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A system of interior or house conduits consisting of one or more pairs of tubes or pipes running from a central point of distribution to one or more points of consumption, one tube of each pair inclosing the advance and the other tube the return conductor, said conductors being removable therefrom, substantially as described.

2. A system of interior or house conduits consisting of one or more pairs of protecting-tubes running from a central point of distribution to one or more points of consumption, and subordinate junction-boxes, one or more, located at said points of consumption, one tube of each pair inclosing the advance and the other tube the return conductor, both of said conductors passing through the aforesaid subordinate junction-boxes and being removable from the protecting-tubes, substantially as described.

3. A system of interior or house conduits consisting of one or more distribution junction-boxes having attached to it one or more pairs of protecting-tubes running to outlying points of consumption, one or more, and subordinate junction-boxes located at said points of consumption, each pair of tubes running through the subordinate junction-boxes connected thereto and including the advance and return conductors, said conductors being removable from the protecting-tubes, substantially as described.

4. In a system of interior or house conduits, a direct and a return main or lead electrically connected with the interior of a central distribution-box having one or more pairs of protecting-tubes leading therefrom to outlying points of consumption, including subordinate junction-boxes, one or more, each pair of tubes and the subordinate junction-boxes connected thereto, including a direct and a return conductor, with electrical connections between the main and said conductors, all of the conductors being removable from the protecting-tubes, substantially as described.

5. In a system of interior or house conduits, a junction-box provided with a removable cover and an insulating-base supporting electrical connections, with a pair of incoming leads with one or more pairs of conductors located in corresponding pairs of protecting-tubes running to various points of consumption and connected to one or more subordinate junction-boxes having removable covers, all of the leads and conductors being removable from the protecting-tubes, substantially as described.

6. A system of interior or house conduits consisting of one or more pairs of insulating

- or protecting tubes joined together by a surrounding shield or sleeve and connected at one end to a distribution-box and at the other to one or more subordinate distribution-boxes, each of said pairs of tubes constituting an inclosure for the direct and return conductors running through the junction-boxes, all of said conductors being removable from the protecting-tubes, substantially as described.
7. A conduit-tube consisting of two tubes of insulating material completely surrounded by a metallic sleeve, which joins them together, substantially as described.
8. A compound tube consisting of a pair of tubes and a thin metallic sleeve, which surrounds each tube and joins the pair together by an intermediate web, substantially as shown and described.
9. A conduit-tube consisting of a pair of insulating-tubes located side by side and surrounded by a thin metallic covering, which joins them together by an intermediate web, substantially as shown and described.
10. A detachable or removable fixture-support secured to the bottom of a junction-box

provided with a removable cover, through which the conductors running to the electric lamp or analogous electric translating device pass, substantially as described.

11. A system of interior or house conduits consisting of one or more pairs of tubes or pipes running from a central point of distribution to one or more outlying junction-boxes provided with removable covers, one tube of each pair inclosing the advance and the other a return conductor, substantially as described.

12. In a system of interior or house conduits, a main junction-box provided with a removable cover, in combination with one or more pairs of tubes or pipes running through outlying subordinate junction-boxes provided also with removable covers, one tube of each pair inclosing an advance and the other the return conductor, substantially as described.

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