United States Patent

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[32] Priorities **Feb. 21, 1969**
[33] **France**
[31] **6904379;**
Feb. 6, 1970, France, No. 7004355

[54] **ELECTRICAL DISTRIBUTION ASSEMBLY INTENDED TO FORM PREFABRICATED ELECTRIC CONDUITS**
6 Claims, 14 Drawing Figs.

[52] **U.S. Cl.** ..... **339/22 R,** 339/21 R
[51] **Int. Cl.** **H01r 13/60**
[50] **Field of Search** 339/20–24

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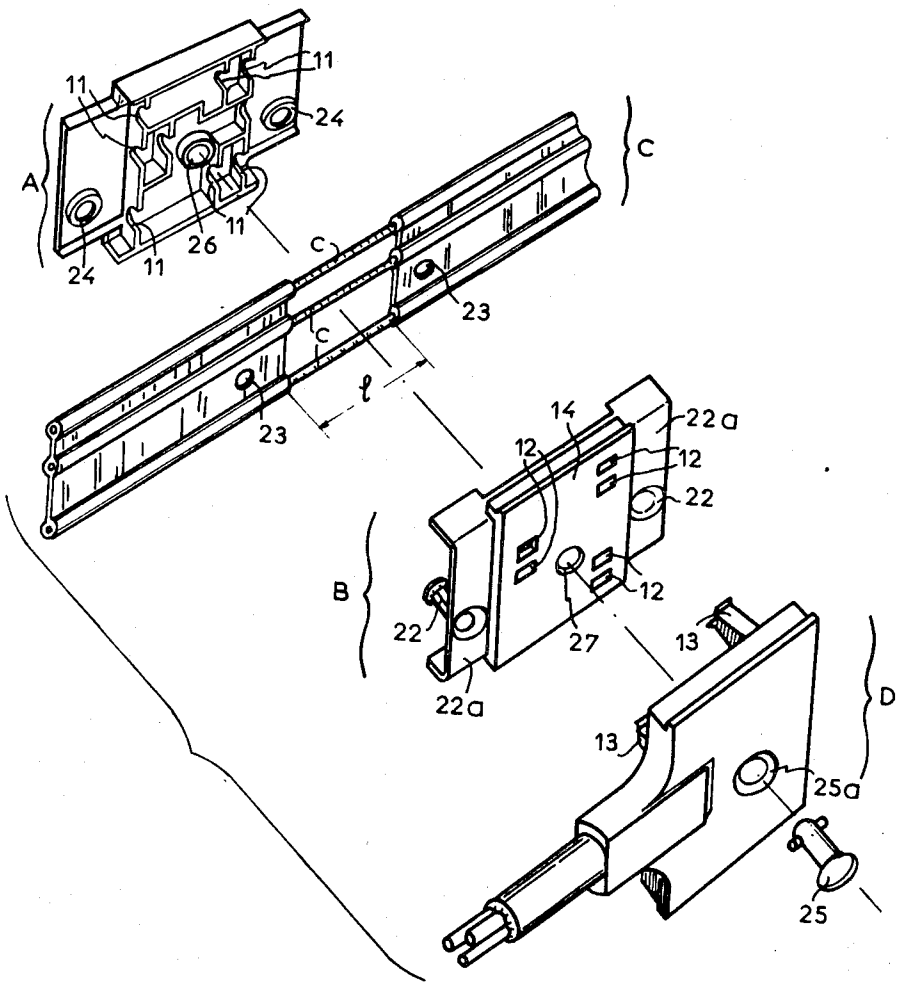
ABSTRACT: An electric distribution unit with electric current supply conductors advantageously embedded in a strip of insulating material of which a portion can be bared, said unit being mounted in an opening formed in a supporting wall and comprising: at least one element adapted to receive said bared portion of said conductors, at least two flexible parallel edges provided on said element and locking lugs carried by said flexible edges; whereby: said unit adapts itself on the perimeter of said opening and said strip containing said conductors is held flat against said wall.



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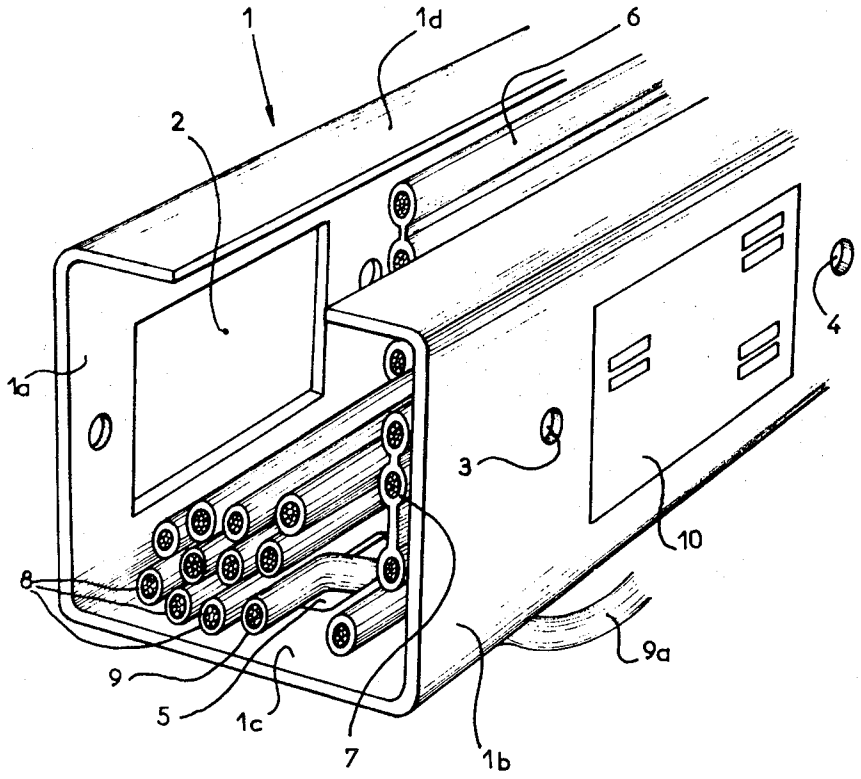

FIG.1

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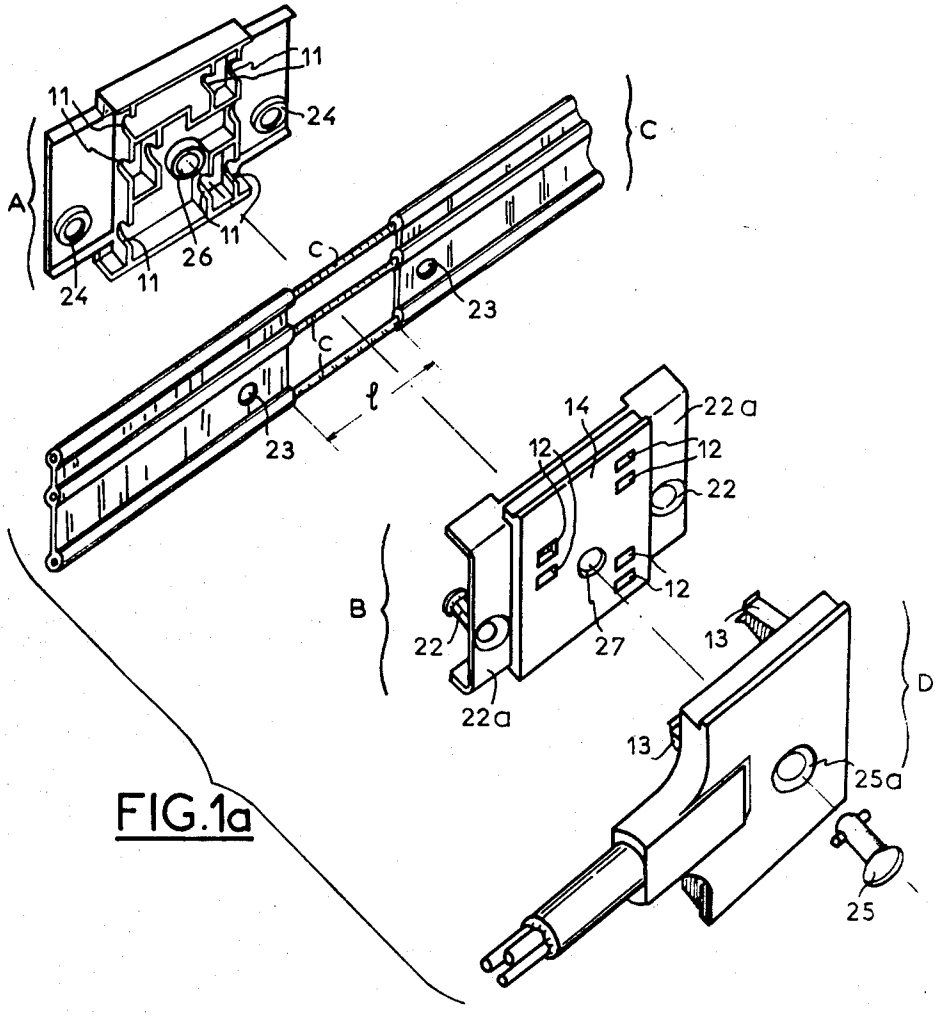
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FIG.1a

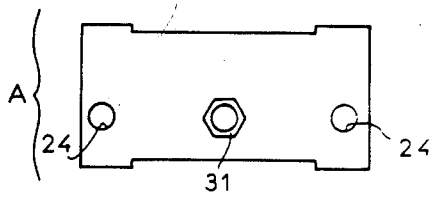

FIG. 2

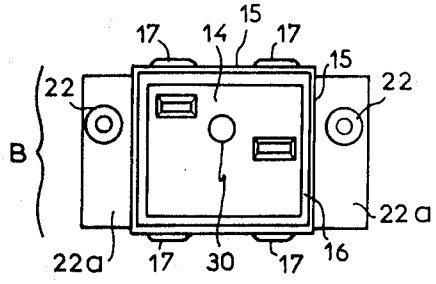

FIG. 3

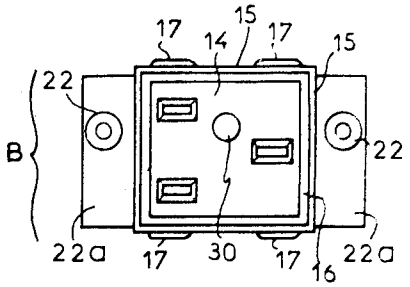

FIG. 4

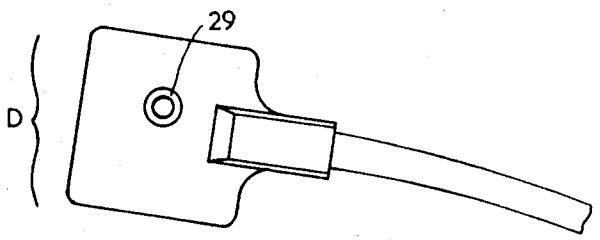

FIG. 5

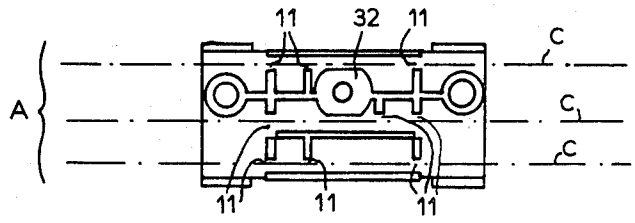

FIG.2a

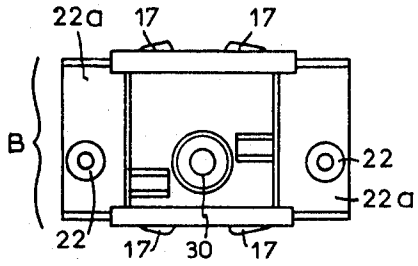

FIG. 3a

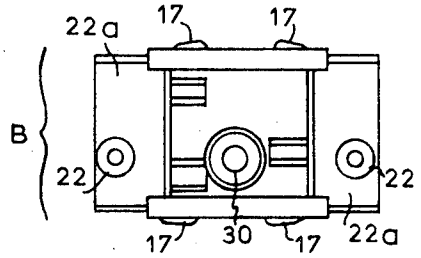

FIG.4a

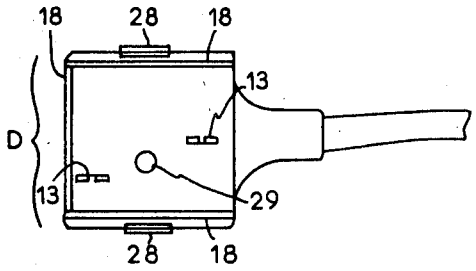

FIG.5a

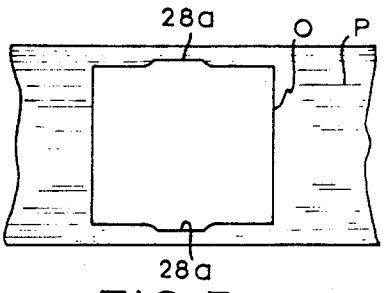

FIG. 7

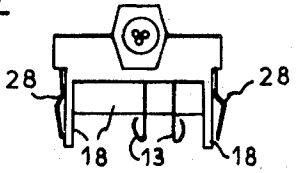

FIG.5b

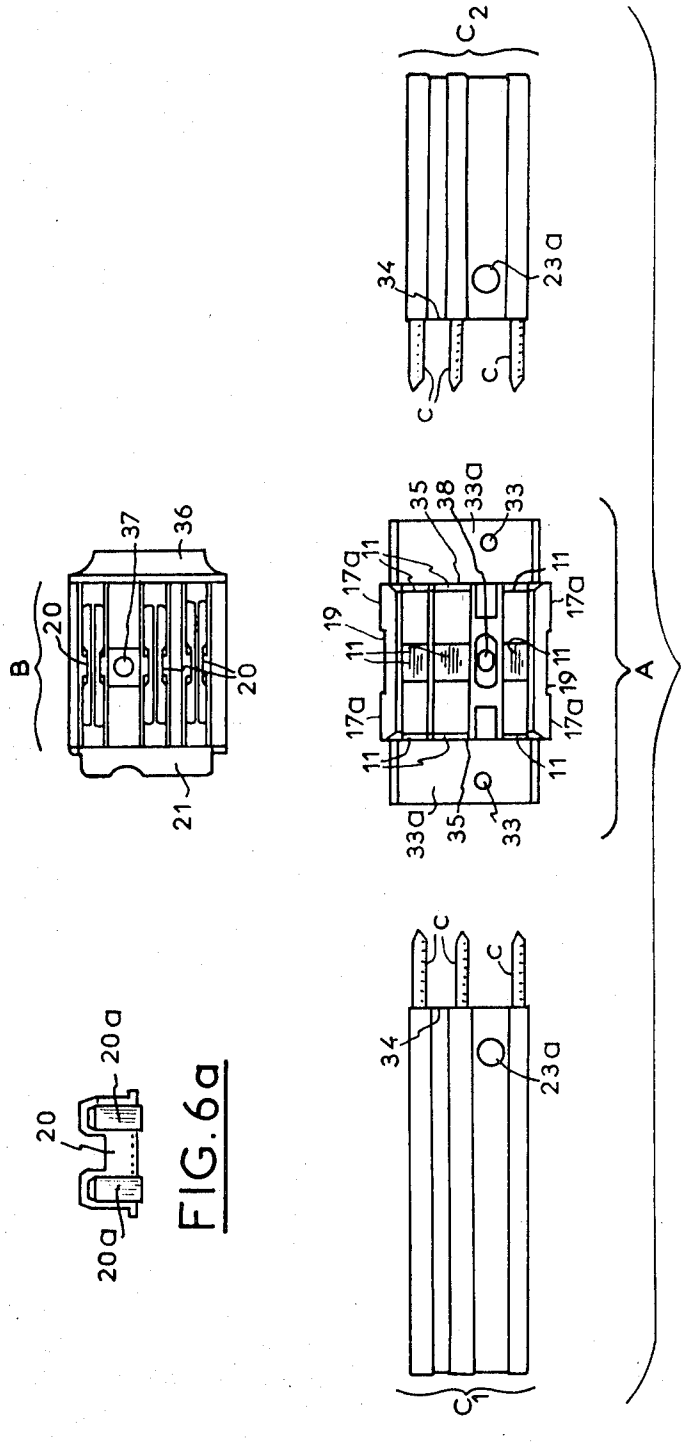

FIG. 6

FIG. 6a

ELECTRICAL DISTRIBUTION ASSEMBLY INTENDED TO FORM PREFABRICATED ELECTRIC CONDUITS

The present invention has for its object an electrical distribution assembly which is placed in an opening formed in a supporting wall.

Outlet unit assemblies or like accessories are already known which are intended for use in electrical installations comprising insulating strips or tapes containing conducting wires, these strips or tapes being placed on the surface of their support, for example on a wall or on a skirting board.

One or more accessories of this kind are interposed at any points of the strip without it being necessary to cut the conductors, a portion of the conductors being bared without being cut, in order to carry out the desired electrical connection.

These outlet unit assemblies or similar accessories comprise a base and a cover which grip between them the insulating strip. The cover and the base are mechanically coupled to each other by appropriate means, for example by forming holes in the cover close to its opposite edges, these holes facing corresponding holes formed in the base so as to receive screws which also serve to fix the outlet unit assembly on an appropriate support. These screws also pass through the insulating body of the strip, and holes are thus formed in this strip.

Furthermore, harness ducts for electric current distribution installations are also known which are pierced with openings for the wiring of switches and outlet unit assemblies.

These harness ducts generally leave little room for other conducts intended for other uses, which are most frequently carried by channels, housings or additional shelves, added internally to the harness ducts.

The invention is directed to an electrical distribution assembly which is placed in an opening of a supporting wall, characterized in that it comprises at least one plate receiving the electric current supply conductors, which are preferably embedded in a strip of insulating material, in such manner that this strip is placed, without other fixing means, against the inner face of the sidewall in which is formed the opening considered.

The assembly according to the invention may especially be placed in an opening formed in a sidewall of an electric current distribution installation duct, the central portion of this duct, left empty by the side flattening of the conductor strips, being capable of receiving other conduits intended for various other uses.

Other characteristic features and advantages of the present invention will be brought out in the description which follows below, reference being made to the accompanying drawings, in which:

FIG. 1 is a perspective view of an assembly according to the invention, having its mounting in an opening formed in a sidewall of an electric current distribution installation ducts;

FIG. 1*a* is a perspective view of an assembly according to the invention, forming a current supply outlet arranged for three conductors;

FIGS. 2 and 2*a* are plan views of an element common to two forms of embodiment of current supply outlets; FIG. 2 shows the rear face of the element and FIG. 2*a* the front face;

FIGS. 3 and 3*a* are plan views of the exterior and interior of another current supply outlet element with two conductors;

FIGS. 4 and 4*a* are plan views of the exterior and interior of an element similar to the previous element but in a current supply outlet with three conductors;

FIGS. 5, 5*a* and 5*b* are views of the back, the interior and the end of a male current supply outlet with two pins;

FIG. 6 is a plan view showing an alternative form in which two elements permit the jointing of two portions of conductor strips;

FIG. 6*a* is a detail view of double jaw;

FIG. 7 is a view in elevation of a portion of supporting wall pierced with an opening.

With reference to FIG. 1, a portion of ducting 1 is shown with a rectangular cross section, the two sides of which correspond to the lateral walls 1*a* and 1*b*. These two walls, or one only, are formed with openings 2, separated from each other by a distance depending on the desired utilization. On each side of each opening, there are formed fixing holes 3 and 4.

The lower part 1*c* of the duct is provided longitudinally with openings 5 which can be arranged either axially, for example in the central axis, or in staggered relation or in any other way. As regards the upper portion 1*d*, this is provided with a continuous axial gap limited by the supporting edges for a cover (not shown) which is fitted in position for example by click and ratchet engagement.

In the interior of this duct, against the lateral walls 1*a* and 1*b*, are respectively arranged the element 6 and 7 which constitute the carrying and distribution conduits of the electric current. These elements are held against the internal faces of these supporting walls and are advantageously joined together so as to form a kind of strip, and comprise the desired number of wires, generally corresponding to the number of holes for receiving the pins of the current supply outlet, these holes being provided in a supporting plate 10.

This plate serves, at the same time, as a means of distribution of the electric current and of maintenance of all the wires or cables of each electric conduit against the wall. The latter are in fact placed in front of each opening 2 in the duct and are gripped in a plate 10 which is securely coupled to the wall by fixing means introduced into the holes 3 and 4.

The electric conduits being thus held against the lateral walls of the duct and being easily arranged so as to provide a branch supply of electric current necessary for supplying the geographical sector placed in the area of passage of the duct, it follows that the intermediate space is no longer encumbered so that there may easily be placed in this space a certain number of wires, cables or tubes intended for different uses, the utilization of which is completely independent of the lateral electric conduits.

In this way it is possible to arrange a certain number of elements 8 loosely arranged on the lower portion 1*c* serving as a support, until they completely fill the whole of the empty space defined on one side by the distance between the two electric conduits 6–7 or possibly between one of these latter and the opposite wall and, on another side, by the distance between the two parts 1*c* and 1*d*.

Depending on the utilization and the destination of the elements 8, the latter may be deviated from the supporting duct when this is necessary, by causing them to pass out of the duct through the openings which have been formed in the duct, such as the ports provided in the bottom 1*c*, or alternatively through the longitudinal continuous opening located in the upper portion 1*d*. This is the case of the cable 9 which, as shown in the drawing, passes through the port 5 in such manner that one extremity 9*a* passes out of the duct over a length sufficient to reach the device which is to be coupled to the other extremity of the cable (not shown).

In the form of embodiment shown in FIG. 1*a*, a plate A and a cover B made of insulating material and preferably of molded plastic material, hold between them a strip of insulating material C in which are embedded three conductors *c*. The whole unit constitutes a current supply outlet completed externally by a male element D with pins.

The conductors *c* are laid bare over a certain length 1 so as to be received in corresponding cradles 11, formed in the plate A.

On the path of the conductors *c* introduced into their respective cradles 11, the cover B is provided with orifices 12 so as to receive the pins 13 of the element D.

The form of embodiment shown in FIGS. 3 and 3*a* constitutes a current supply outlet with two conductor.

The form of embodiment shown in FIGS. 4 and 4*a* relates to a current supply outlet with three conductors.

FIGS. 2 and 2*a* represent an element A which is equally suitable to the form of embodiment of FIGS. 3 and 3*a* and to the form of FIGS. 4 and 4*a*.

This element is provided internally with three cradles **11** arranged parallel so that they can receive, either a set of two conductors *c*, or a set of three conductors *c*.

The element B shown in FIGS. **3** and **3***a* (current supply outlet with two conductors) like the element B shown in FIGS. **4** and **4***a* (current supply outlet with three conductors) is provided provided externally with a quadrangular projecting plate **14** surrounded by a flexible frame **15**, a groove **16** existing between the plate and the flexible frame (the flexibility of the frame **15** is due to the material of which the element B is made).

This flexible frame is provided laterally with lugs **17** intended, as will be explained below, for fitting the element into an opening O in the supporting wall P which may be a lateral wall of the duct.

The male element D of the current supply outlet, carrying the pins **13**, is provided with straight fins **18** on three of its sides. These fins are intended to serve at the same time for automatic guiding of the male element D in the groove **16** of quadrangular perimeter of the element B, for holding this element D in position and as a means of protection for the user.

The element D shown in FIGS. **5** and **5***a* cooperates with the element B of the current supply outlet with two conductors.

The element D cooperating with the element B of the current supply outlet with three conductors obviously comprises three pins **13** and has not been shown.

In the alternative form shown in FIG. **6**, the element A and the element B serve to join together two different elements C1 and C2 of the strip with embedded conductors. The element A receives in its cradles **11** a bared portion of conductors *c* of the element C1 and a bared portion of conductors *c* of the element C2.

This element A comprises two lateral edges **19**, parallel to each other and parallel to the cradles **11** on which are provided lugs **17***a* similar to the lugs **17** of the elements B of the forms of embodiment of FIGS. **3**, **3***a*, and **4**, **4***a*.

The cover B of the alternative form shown in FIG. **6** comprises double jaws **20** gripped by clips **20***a* and housed in grooves or recesses in this cover, the said jaws each joining a conductor *c* of the element C1 and a conductor *c* of the element C2. It further comprises a locking tongue **21**.

The fixing, immobilization and locking of the various elements to each other and of the whole of these elements on a supporting wall, resulting in the production of current supply assemblies and jointing devices, are effected in the following manner:

I the form of construction shown in FIG. **1***a*, two hollow studs **22** (in the form of headed plugs) provided on the wings **22***a* of the element B, each pass through a hole **23** formed in the strip of insulating material of the element C so as to be driven and locked in a corresponding socket **24** formed in the element A. This arrangement thus permits the fixing of the elements A, B and C to each other. The fixing of this assembly in a supporting wall (which may be a lateral wall of a duct) is obtained by means of simple screws passing through the wall and screwing into the hollow studs **22** which are threaded for that purpose. The element D with pins **13** can be locked in its turn on the assembly A, B, C by means of a bayonet screw **25** engaging in a corresponding socket **26** formed in the element A, after having passed through the element D by an orifice **25***a* and the element B by an orifice **27**.

In the forms of embodiment of FIGS. **3**, **3***a* and FIGS. **4**, **4***a* (the element A of FIGS. **2** and **2***a* being common to the two alternatives), the assembly of the element A and the element B with the interposition of the element C is effected as previously by means of hollow studs **22** in the form of headed plugs locked in corresponding sockets **24**. On the other hand, these studs are not necessarily threaded to receive fixing screws passing through the supporting wall (see the holes **3** and **4** formed in the duct shown i FIG. **1**), this fixing being then obtained by hooking the element B on the periphery of the opening formed in the supporting wall.

Due to the elasticity of the frame **15**, the studs **17** can be withdrawn during a first stage and then returned to their first position in front of the front face of the wall in a second stage, the introduction into the opening O being effected by the rear face.

It is therefore not necessary in this case to form the holes **3** and **4** for fixing screws in the supporting wall P.

The element D with pins **13** can be fitted on the element B by means of its fins **18** which pass into the quadrangular perimeter groove **16** of the element B. Two of these fins, parallel to each other, pass deeply into two parallel sides of the perimeter of the groove **16**, while the third fin of lower height is engaged in one of the sides perpendicular to the two sides already considered of the perimeter of this groove and having a depth corresponding to this third fin. Elastic lateral earthing clips **28** are provided on the element D so that these clips close on the flexible frame **15** of the element B when the element D is completely forced into the element B. A notch **28***a* can be provided on two parallel sides of the periphery of the opening O formed in the supporting wall P in order to permit the passage of these clips **28**.

The element D can be locked on the assembly A, B, C by means of a screw (not shown) which passes through the element D by an orifice **29**, the element B by an orifice **30** and is screwed into a nut **31** embedded in a corresponding socket **32** of the element A.

I the form of construction shown in FIG. **6**, the element C1 and the element C2 are each pierced with a hole **23***a* for the passage of a centering stud **33** provided on one wing **33***a* of the element A. The cut edge **34** of the strip forming the element C1, and also the cut edge **34** of the strip forming the element C2 come into abutment against the lateral edges **35** of the cradles **11**.

The lateral edges **19** of the element A are provided, like the flexible frame **15** of the alternative forms shown in FIGS. **3**, **3***a* and **4**, **4***a*, with lugs **17***a* permitting the locking of the element on the periphery of the opening O formed in the wall P.

The double jaws **20** of the element B may then be engaged on the bared portions of the conductors *c* of the elements C1 and C2 so as to join these conductors together. In doing this, the tongue **21** of the element B is slid from the outside towards the inside behind the wall P and the element B is engaged by pivoting between the edges **19** of the element A.

An outer tongue **36** is provided on the element B and in a different plane from the tongue **21**, so as to enable the element B to be disengaged. The element B can be fixed to the element A by means of a screw passing through the element B by a hole **37** and screwing into a nut embedded in a corresponding socket **38** of the element A.

It will of course be understood that the present invention has only been described and illustrated by way of preferred examples, and that equivalent means can be provided in its constituent elements without thereby departing from the scope of the said invention.

I claim:

1. A connection device for connecting electrical conductors embedded in two strips of insulating material with said electrical conductors having bared portions protruding from said strips of insulating material and said device being mounted in an opening formed in a supporting wall comprising

first and second elements interfitted to each other;

said first element including

straight parallel cradles adapted to receive said bared portions of said conductors,

centering means connected to each of said strips of insulating material,

at least two flexible parallel edges,

and locking lugs carried by said edges so as to obtain a locking effect of said first element on the periphery of said opening in the supporting wall;

said second element including

straight parallel grooves, each adjacent one of said cradles of said first element,

double jaws of conducting and resilient material housed in said grooves and each connecting one of the bared portions to another bared portion of the other strip of insulating material,

a locking tongue along at least one edge of said second element permitting said first and second elements to be joined by pressure around said tongue serving as a supporting point.

2. An electrical distribution system comprising

a U-shaped channel adapted for carrying conductors between the parallel walls of said channel;

at least one insulated strip having a plurality of parallel wires embedded therein with intermediate webs between said wires;

said insulated strip positioned along the inside face of one of said walls and held between a first insulated element and a second insulated element;

one of said elements having inwardly clamping surfaces and said insulated strip having a bared portion positioned in said clamping surfaces;

said second insulated element positioned in front of an opening formed in said wall of said channel and having apertures adapted to receive the prong of a connecting plug;

said first insulated element having lateral edges outside the area of said clamping surfaces;

said second insulated element having lateral edges of flexible material positioned in front of said edges of said first element;

a pair of locking lugs between said edges of said elements;

and means for securing said second element to said wall of said channel.

3. The electrical distribution system of claim 2, further characterized by

said locking lugs having a hollow spongy stud integral with said flexible edge of said second element, a head on said stud suitable for engaging in a hole in said edge of said first element, and a shaft threaded in its interior for an attaching screw passing through said wall of said channel.

4. The electrical distribution system of claim 2, further characterized by

said second element having a central substantially quadrangular plate having said aperture therethrough adjacent said bared portion of said insulated strip;

said plate having a groove on said periphery;

a connecting plug substantially similarly shaped to said plate and having resilient flanges flexibly engaging said groove on said plate;

and a locking lug passing through the face of said connecting plug and engaging said plate of said second element.

5. The electrical distribution system of claim 4, further characterized by

said inwardly clamping surfaces being positioned on said second element and having double jaws of conducting material located adjacent said apertures for contact with prongs from said connecting plug.

6. The electrical distribution system of claim 2, further characterized by

said means for securing said second element to said wall of said channel being a flexible frame on said second element with parallel flanges on said frame and protruding fins on said frame to obtain a locking effect with the periphery of said wall of said channel.

* * * * *