United States Patent

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[33] **Germany**
[31] **P 16 15 547.8;**
May 27, 1968, Germany, No. P 17 65 482.9

[54] **CURRENT SUPPLY ARRANGEMENTS FOR MOBILE LOAD DEVICES**
30 Claims, 21 Drawing Figs.

[52] **U.S. Cl.** ..... **191/23 A,** 174/70 C, 191/35, 191/45 A, 339/22
[51] **Int. Cl.** **B60m 1/34**
[50] **Field of Search** ..... 174/70.3; 339/21, 23, 22 T; 191/35, 22, 23 A

[56] **References Cited**

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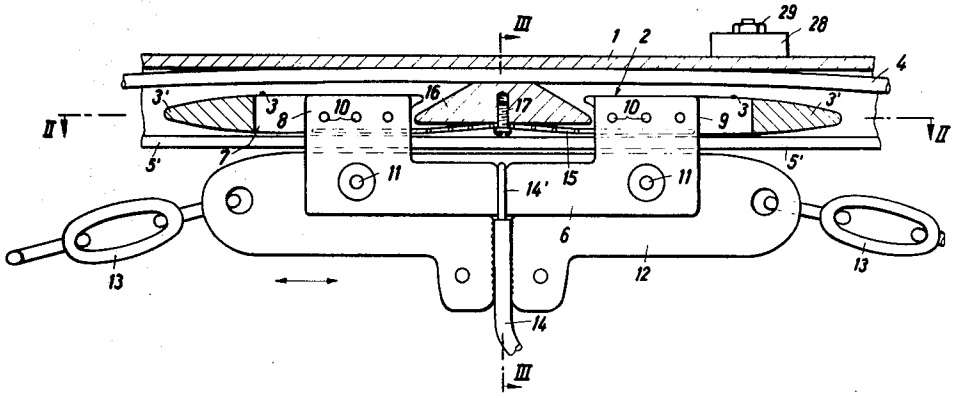
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ABSTRACT: A current supply arrangement for a mobile load device consists of an elongate, flexible, stringlike member of hollow-sectioned profile forming a collection line duct accommodating a flexible conductor of corresponding length and forming a single current supply pole, and a current pickup device comprising a slide carried by the collector line duct and guided in a slot therein, the slide being connected with the load device for traction thereby. A plurality of these single current supply poles are strung in side-by-side parallel relation along a required route to form a multipole current supply unit.



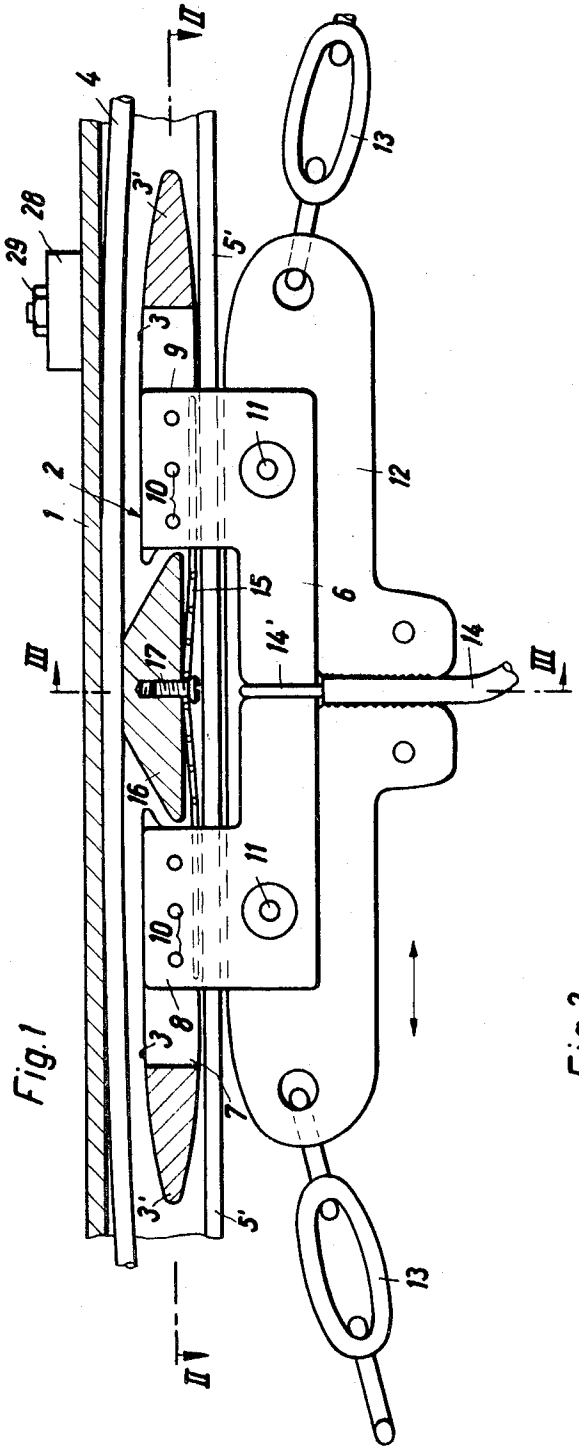


Fig.1

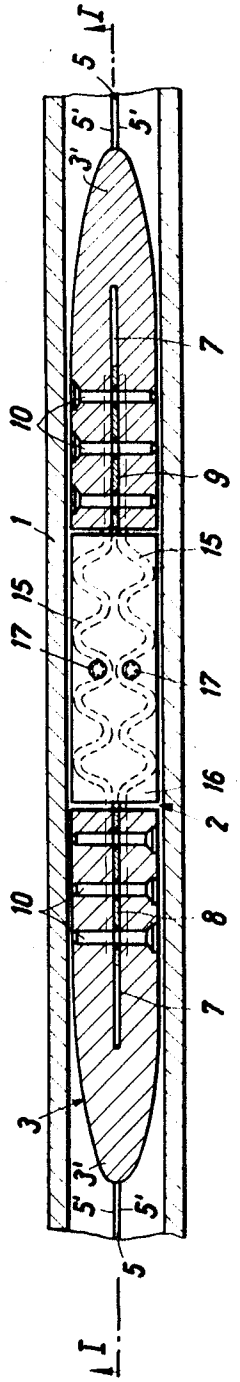
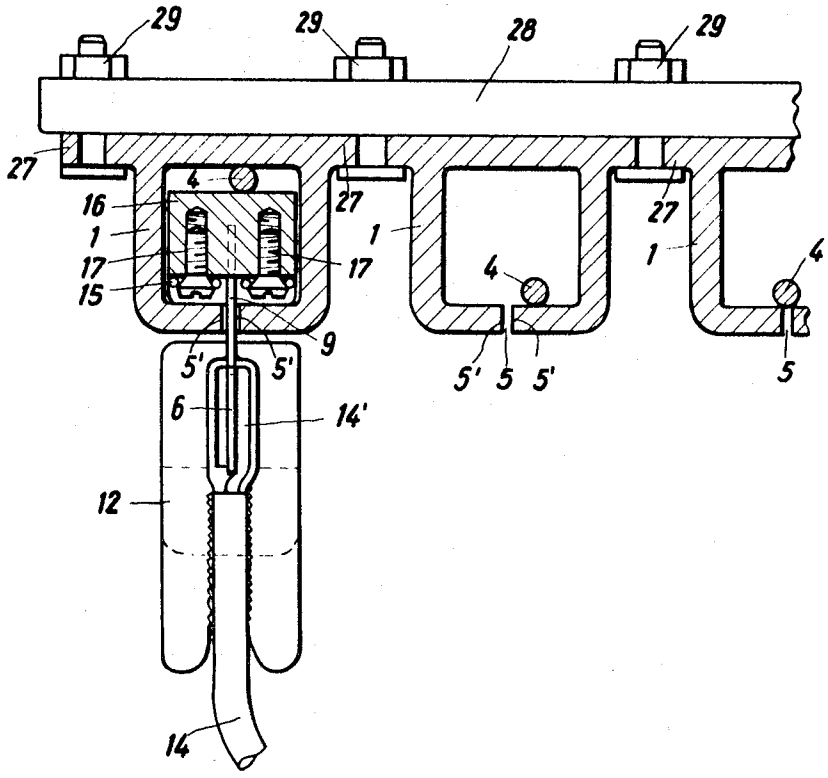


Fig.2

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Fig.3



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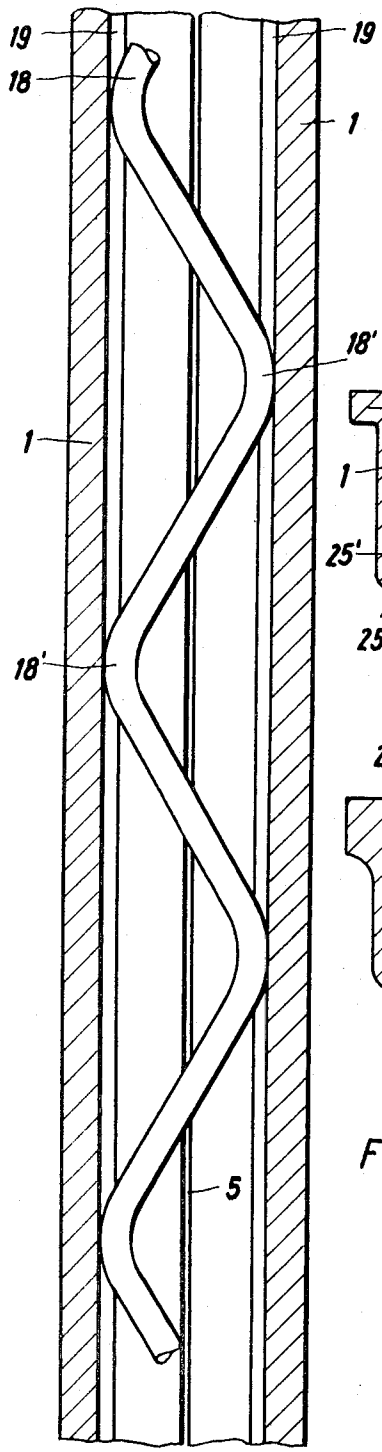


Fig.5

Fig.4

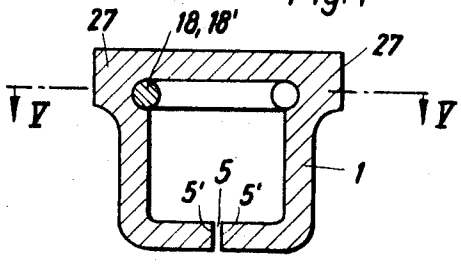


Fig.6

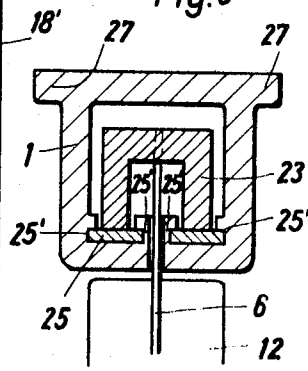


Fig.7

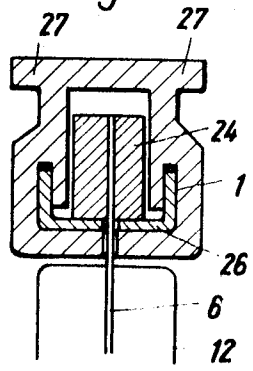


Fig.8

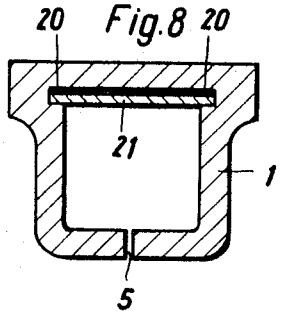
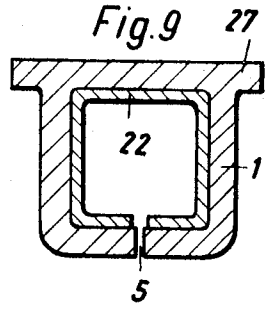


Fig.9



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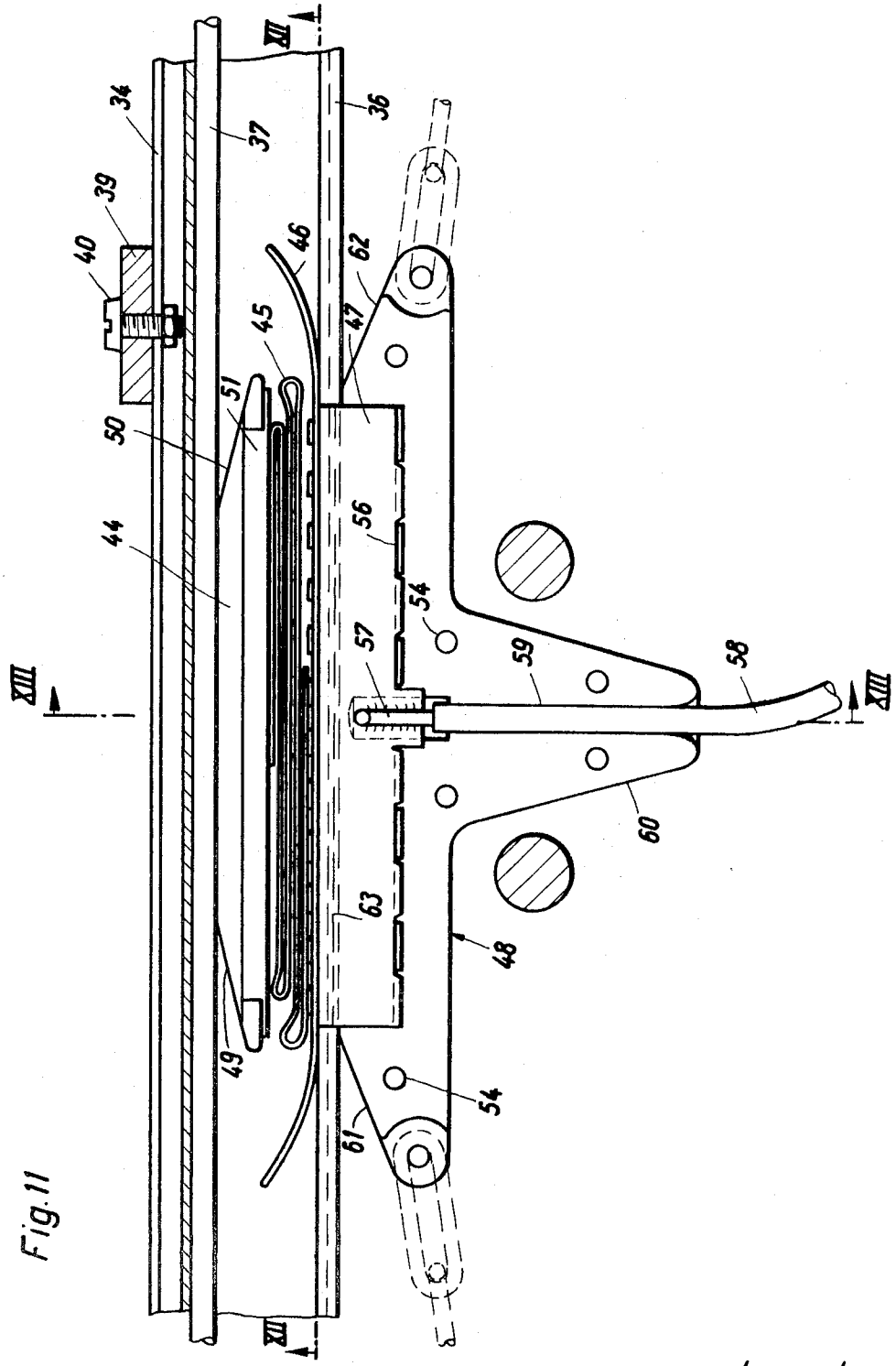


Fig. 11

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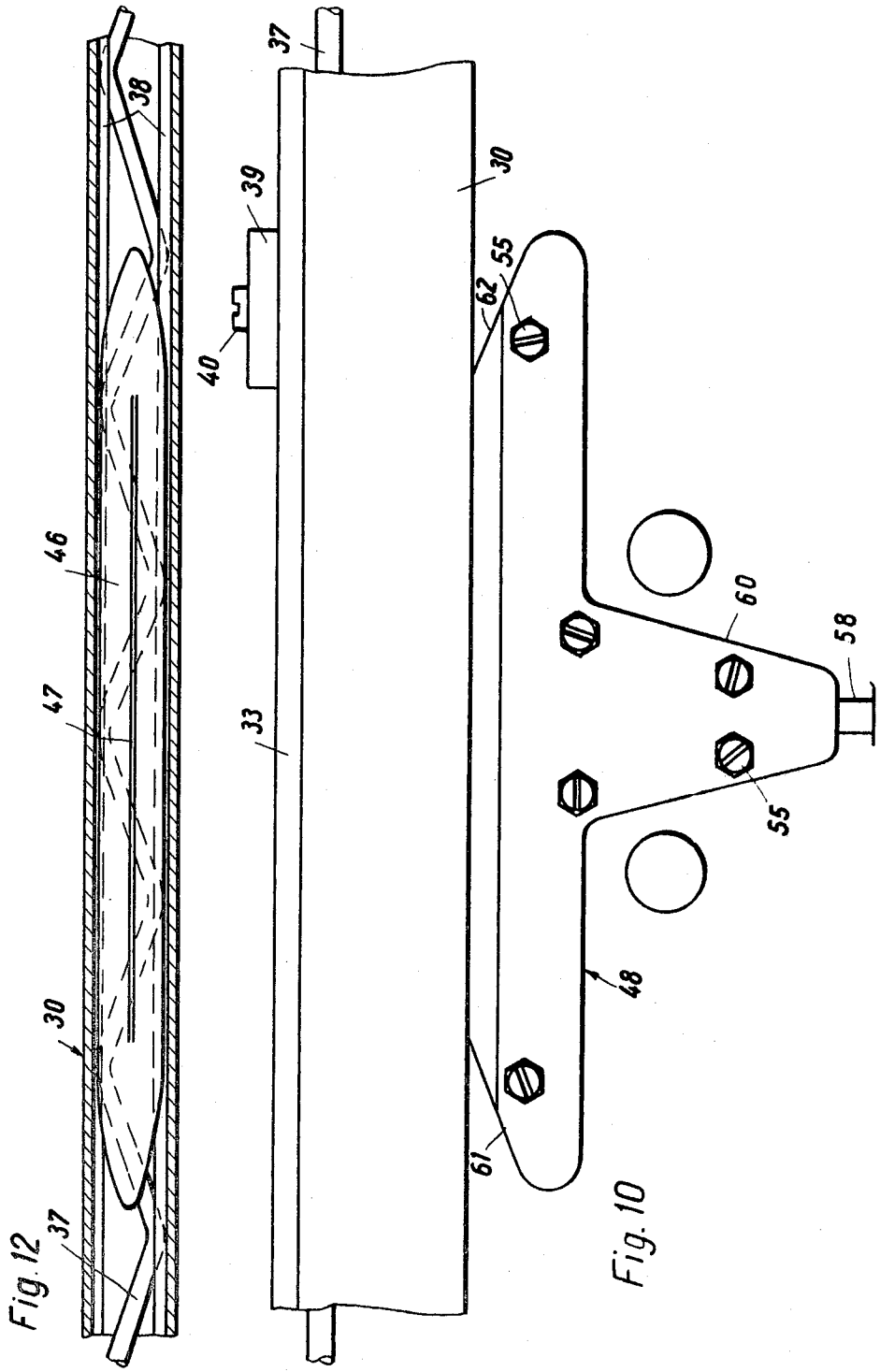


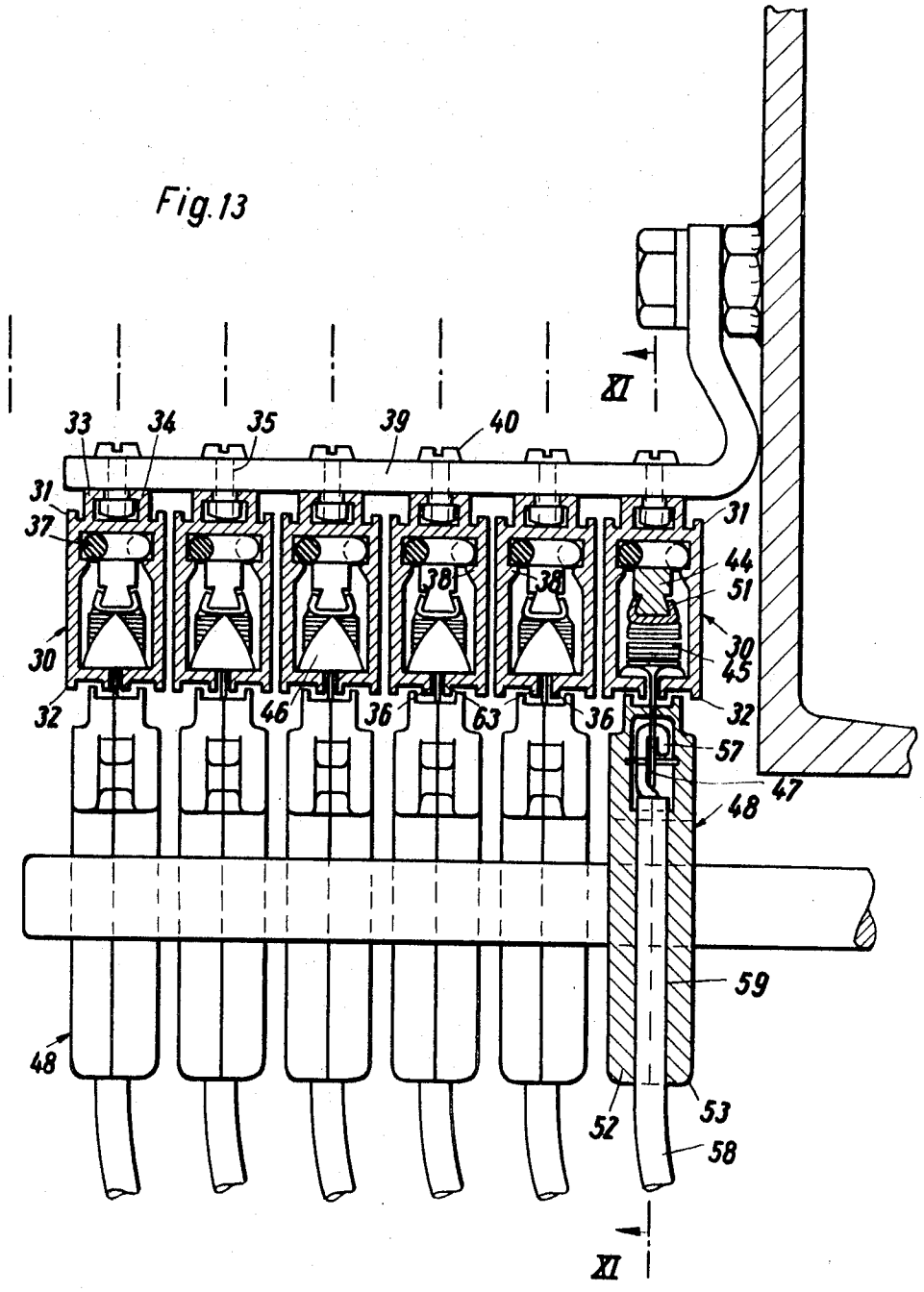
Fig. 12

Fig. 10

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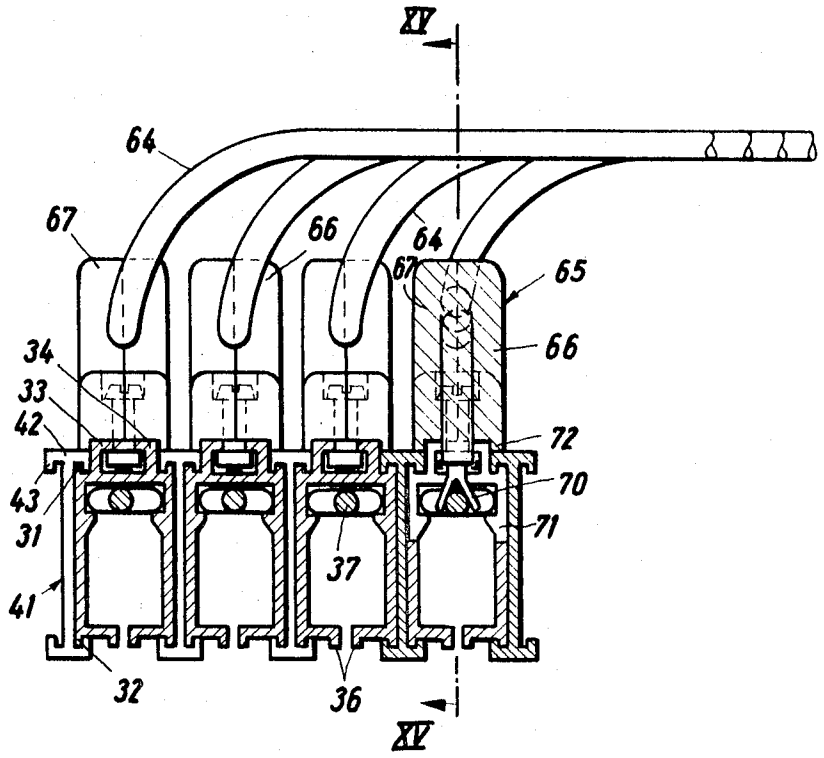
Fig. 13



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Fig. 14



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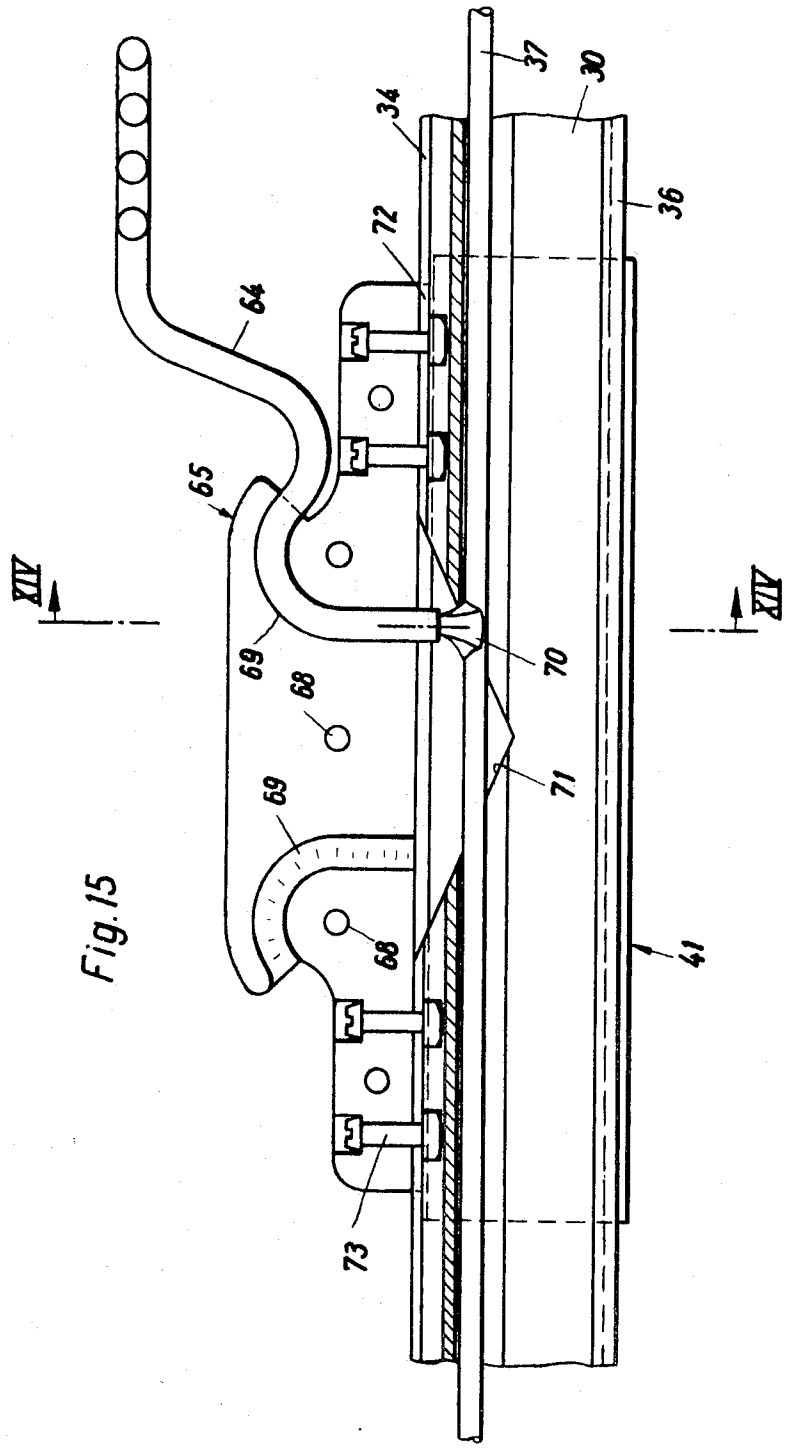


Fig. 15

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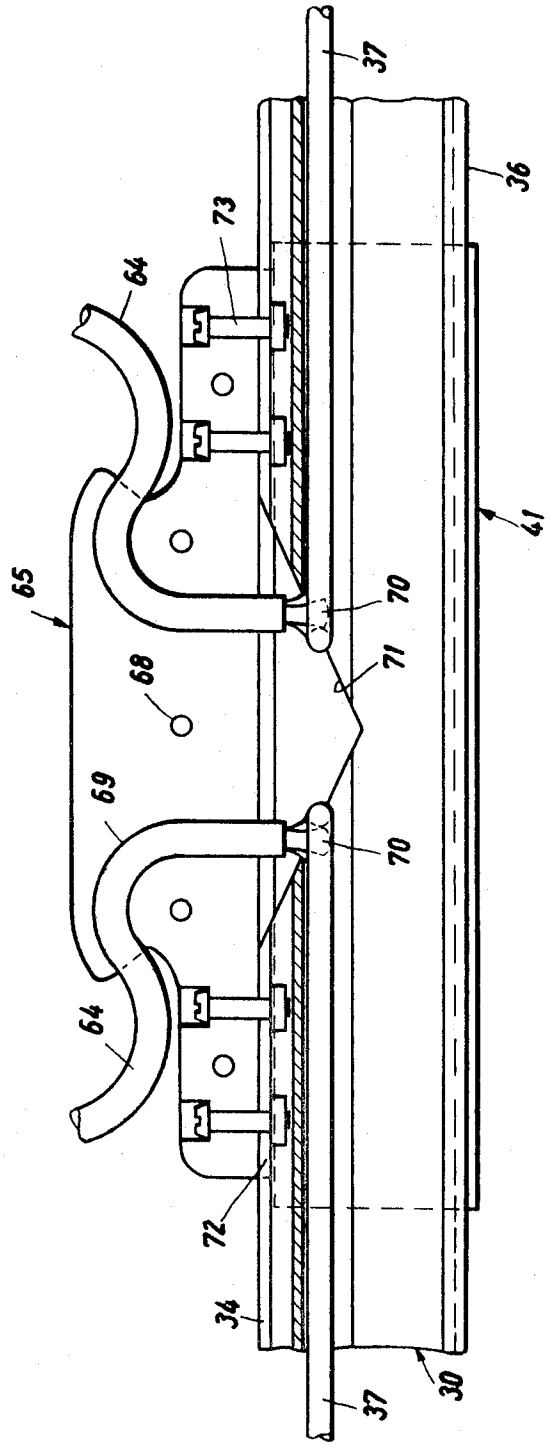


Fig. 16

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Fig. 17

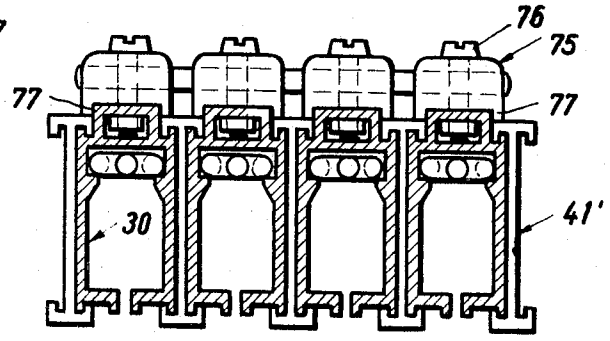


Fig. 18

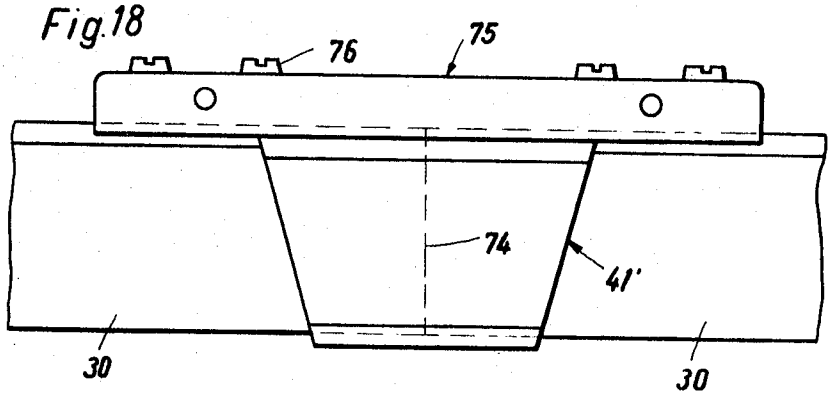
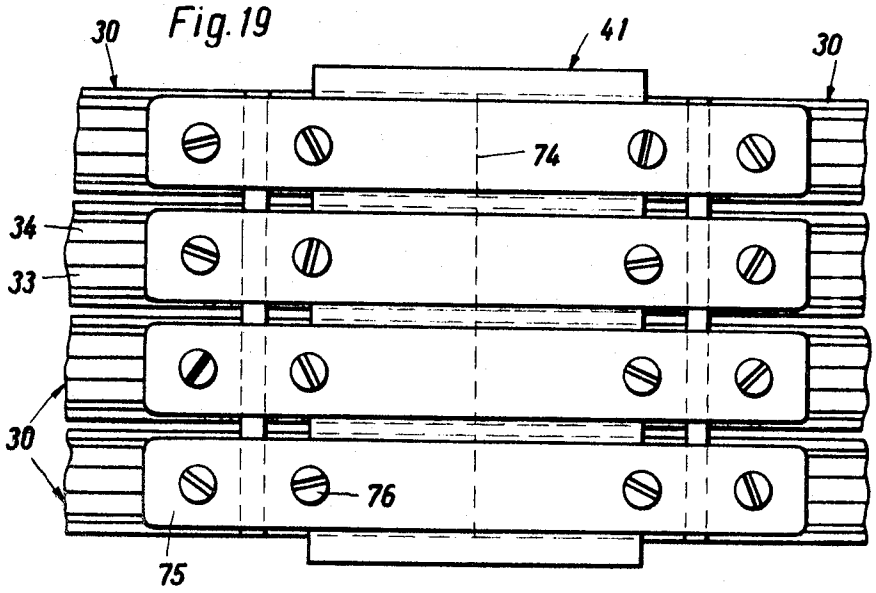


Fig. 19



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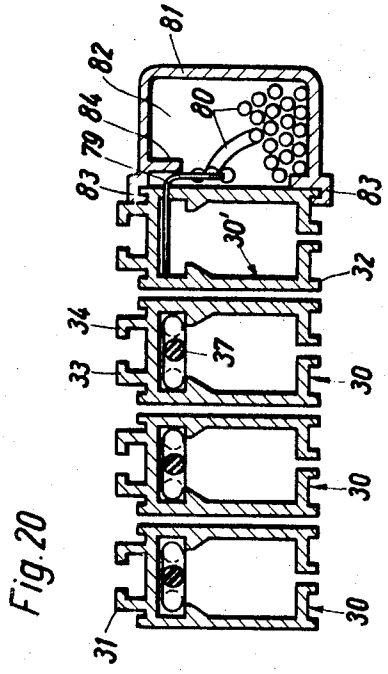


Fig.20

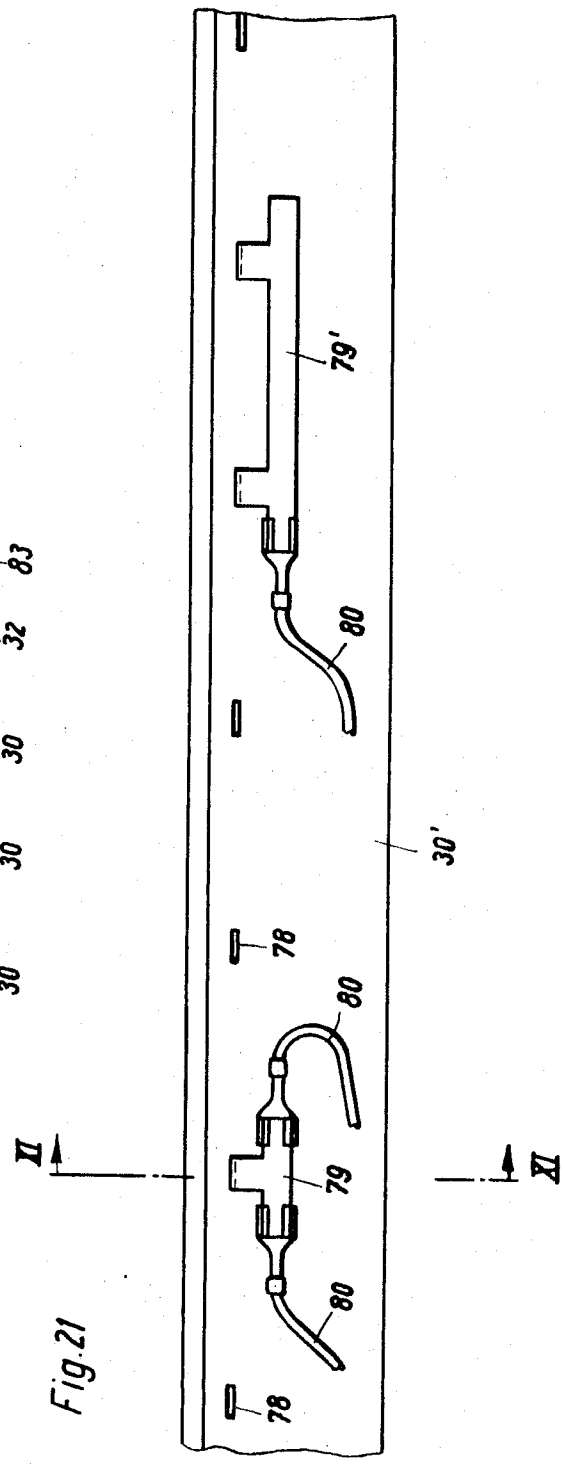


Fig.21

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CURRENT SUPPLY ARRANGEMENTS FOR MOBILE LOAD DEVICES

This invention comprises improvements in current supply arrangements for mobile load devices such as traveling cranes, overhead trolley systems and so on.

In hitherto known arrangements for this purpose, a collector line duct, whose cross-sectional dimensions make it bulky, is made up of separate, individually rigid lengths which in the neighborhood of their butt ends are joined together by means of plug-in connectors and clamps. On the sidewalls of the rigid box sections, mountings are arranged one above the other to carry the current-supply bus bars. The number of bus bars which has to be accommodated in the collector line duct in a given case, depends upon the number of poles required. In this context, the current pickup device is a complex trolley arrangement which is guided inside the collector line duct on rollers.

Arrangements of this hitherto known kind are complex in design and entail laborious assembly work. In practice, the arrangements will be laid along a track which can involve bends, junctions, upgrades, and downgrades. Because special collector line duct sections have to be provided to accord with any deviation from the straight, a plurality of special sections is needed. Accordingly, accurate assembly of the track requires accurate measurement and setting out of the planned route because once the special sections manufactured in accordance with this plan have been produced, no other deviations can be taken into account. Also, arrangements of this kind, because of the complexity of their construction, are relatively vulnerable and liable to break down under severe conditions of operation. In particular when the load device traversing at high speeds, the rollers carrying the current pickup trolley reach speeds which, even after a short period of operation, give rise to breakdown as a consequence of excessive wear. Particularly high costs are experienced because of the design of the arrangement as a multipole system, in the context of load devices which only require a small number of current poles for their supply.

It is the object of the present invention, using simple means and at the expense of a low outlay in cost terms, to create an arrangement which is simple in construction and will operate reliably over lengthy periods of time, which is rapid and simple to assemble, and makes it possible to adapt the routing of the system at the time of erection, without needing any previously manufactured specially produced sections, and which at the same time enables the load device to traverse at high speeds.

To this end, the invention provides a current-supply arrangement for a mobile load device consisting of a member of hollow-sectioned profile forming a collector line duct carrying an electrical conductor and a current pickup device movable therein which is connected with the load device through a traction and connecting element extending outside said member through a slot formed in the bottom face of its hollow-sectioned profile, wherein the collector line duct is in the form of a flexible string and accommodates a flexible conductor of corresponding length, forming a single current-supply pole, and the current pickup device comprises a slide carried in the collector line duct and arranged to be guided thereby.

The invention makes it possible to cut the collector line duct to the required length directly on site, just like other goods delivered in bulk lengths, to adapt it to the desired routing simply by bending, and subsequently to secure it in position so that basically all that remains is to introduce the current pickup device in order to put the arrangement into service. The arrangement in accordance with the invention operates faultlessly even at high speeds of traverse, is extremely robust and enables one to dispense with the numerous premanufactured special sections and the business of joining them together, which the known kind of arrangements entailed.

The design of each collector line duct as a single-pole current-supply facility, reduces the outlay in terms of installation and material in particular in the context of small load devices,

without limiting the current-supply facility to single-pole arrangements because in the case of multipole supply facilities several single-pole collector line ducts together with the particular current pickup elements can be installed parallel with one another to form a common supply unit.

In accordance with a further development of the invention along the lines of a module system which makes it possible, using only a few components, to meet all requirements which might be imposed on arrangements of this sort and which offers a broad range of facility for variation, the collector line duct is advantageously provided with mounting flanges which advantageously extend over its full length, the mounting flanges being formed substantially as extensions of its sidewalls so as to project upwards and downwards. These mounting flanges form the basic elements for the side-by-side attachment of two or more collector line ducts in a manner necessary for multipole installations. At the same time, they make it possible to secure ancillary components to the collector line ducts and improve the electrical insulation between the individual ducts.

In order to connect together two collector line ducts at a time, in accordance with the invention clamping strips of synthetic material, substantially having a double-T cross section, are provided and these, through the medium of lips extending inwards at right angles from the flanges, in each case engage behind the four mounting flanges of two neighboring collector line ducts, locking them together. These clamping strips create a firm and virtually jointless connection between adjacent collector line ducts, and the latter therefore, independently of how they are suspended from brackets and the like, are guided precisely parallel to one another both in straight and in curved sections of the route. A curved section can moreover be produced without the need for any special bends (specially manufactured curved sections) or the like simply by bending both the collector line ducts and the clamping strips as well, these, even when made of relatively strong synthetic material, still having adequately high inherent flexibility in order, for example, to be capable of being bent horizontally about a radius of around 2.5 meters and vertically about a radius of about 5.0 meters, without any need for heating or plastic deformation. The substantially rectangular cross section of the strings of profiled section material forming the line ducts, is of such small size considering the single-pole design of these ducts, that the resistance to bending offered by this kind of cross-sectional profile, is not sufficient to prevent such curved installation.

Preferably, those wall sections forming the underside of the collector line duct, will be provided along those of the edges which delimit the slot in the duct, with outward-projecting guide lips. These guide lips on the one hand improve the guiding of a flat connector plate which extends in through the slot and constitutes the connecting conductor, and on the other improves the insulation between neighboring collector line ducts as well as providing protection against contact, this in particular if, in accordance with a further feature of the invention, the insulating bodies of the current pickup elements are provided at those of their ends facing the slot, with profiled sections which laterally enshroud the guide lips at either side of the slot, at an interval.

In accordance with yet another feature of the invention, the slide is in the form of a component guided by the inside walls of the profile string, said component having rounded front and rear ends. In this way, using the simplest possible constructional means, reliable guiding of the slide over the full length of the duct and in particular through curved sections thereof, is ensured, in the latter event the curved leading tip being responsible for the guiding function.

Advantageously the traction and connecting element will take the form of a flat connecting plate of electrically conductive material, simultaneously doing duty as conductor and arranged with its axis parallel to the slide and secured thereto, said plate being in sliding engagement in the neighborhood of the slot in the profile section, with the slot walls, and that of its

parts projecting out of the slot carrying an insulating body to which the traction members of the load device are attached, the supply conductor to the load being taken through the insulating body and being electrically connected with the flat connecting plate. This ensures reliable current pickoff, together with a very considerable saving in space and simplification in the construction.

In accordance with a preferred embodiment, the slide serves as the carrier for a wiper contact component springloaded in relation thereto, the spring doing duty as an electrical conductor between the flat connector plate and the wiper contact. The current conductor on bus bar will preferably take the form of a round-section wire extending in serpentine fashion transversely of the plane of the slot, between the sidewalls of the collector line duct, the lateral peaks of the serpentine formation being secured in grooves formed in the collector line duct.

The design of the current pickup device in accordance with the invention, is particularly well suited to introduction of a special kind of impulse control for the load devices, although this is not limited to an engagement of the kind proposed in accordance with the present invention. The arrangement in accordance with the invention is provided for the purpose of these control functions with one or more through slots arranged at intervals over a certain length and at about the level at which the current supply conductor runs, in one sidewall of a collector line duct, through the slots there being insertable a contact lug connected to a control line and replacing the current supply conductor, which contact lug, in contact with the carbon pickup, establishes a control circuit for the load. Preferably, in this context the collector line duct, designed as a control duct, will be provided for that of its sides in which the through slots are located, with a covering in the form of a profiled strip of synthetic material which, together with said sidewall, forms a closed duct for the accommodation of the control lines. This design makes it possible to supply a control pulse to the load over a more or less arbitrary distance, without any electrical interruption if for example the interval between the contact lugs is made less than the length of the carbon pickup. The covering strip in this context renders special junction boxes for multiwire cables unnecessary, these latter not only leading to high cost but also representing an additional source of possible faults.

The design of the current pickup device in accordance with the present invention makes it very simple to assemble an arbitrary number of individual ducts in module fashion to form a single unit, and in this way to erect a cheap installation which is versatile, especially so far as its routine is concerned. The arrangement, however, enables very high, indeed the highest, rates of traverse on the part of the load devices, coupled with favorable operating properties, in particular long working life and reliable current transmission. For maintenance and checking purposes, the multipole arrangement can rapidly be dismantled and reassembled, and as far as assembling and dismantling of this kind of arrangement is concerned virtually all the operations can be carried out using a set of spanners and a handsaw for cutting off synthetic material components to lengths.

Numerous other features and advantages of the invention will become apparent from the claims and the description, considered in association with the accompanying drawings in which various embodiments of the invention have been illustrated by way of example.

In the drawings:

FIG. 1 is a sectional side elevation of an arrangement in accordance with the invention on line 1—1 in FIG. 2;

FIG. 2 is a section along the line II—II in FIG. 1,

FIG. 3 is a cross section through a multipole arrangement substantially on the line III—III of FIG. 1,

FIG. 4 is a cross section through a collector line duct with a modified conductor,

FIG. 5 is a section on the line V—V in FIG. 4,

FIGS. 6 to 9 illustrate various embodiments of wiper arrangements and conductors considered in section similar to the illustration of FIG. 4,

FIG. 10 is a side elevation of a collector line duct with a cooperating current pickup device, in accordance with a further embodiment of the invention,

FIG. 11 is a vertical longitudinal central section through the arrangement of FIG. 10 taken on line XI—XI of FIG. 13,

FIG. 12 is a simplified section on line XII—XII of FIG. 11,

FIG. 13 is a schematic end elevation on FIG. 10, partially in section on line XIII—XIII of FIG. 11,

FIG. 14 is a view similar to FIG. 13 showing the supply arrangement, taken partially in section on line XIV—XIV of FIG. 15,

FIG. 15 is a section on the line XV—XV of FIG. 14,

FIG. 16 is a view similar to that of FIG. 15, illustrating a supply arrangement with insulation facility,

FIGS. 17 to 19 respectively illustrate an end elevation, a side elevation and a plan of the arrangement of FIG. 10, in the neighborhood of a joint location, the view being partially sectioned,

FIGS. 20 to 21 are respectively a cross section on the line XX—XX of FIG. 21 and a side elevation of a still further embodiment of the invention provided with a special pulse control circuit.

The current supply arrangement shown in FIGS. 1 to 9, consists essentially of a fixed collector line duct in the form of an endless, one-piece, tubelike, flexible hollow-section profile string 1 of synthetic material, and a current pickup device, indicated generally by the reference numeral 2, sliding therein. The pickup device 2 comprises a slide 3 resting in the duct and guided by the internal walls thereof. Along the duct there extends a flexible conductor 4, constituting the single current pole, and in the example of FIGS. 1 and 2 this conductor is simply loosely inserted there. A slot 5 in the underside of the profiled string provides communication and access to the internal space of the duct.

To provide a multipole current supply facility, several of these single-pole collector line ducts 1, complete with associated pickup devices 2, are combined to form a parallel-installed supply unit in the manner shown in simplified fashion in FIG. 3.

In accordance with FIG. 1, the slide 3 occupies the main part of the cross section of the collector line duct 1 and is provided at its front and rear ends with rounded tips 3' which ensure that it will negotiate bends in the duct without jamming. The traction and connecting element is in the form of a flat connector plate, simultaneously doing duty as a conductor, made of electrically conductive material, located with its axis-parallel to the slide 3 and secured to the latter by means of lugs 8, 9 engaging in recesses 7 thereof and attached by fixing elements 10, e.g. transverse bolts, rivets or screws. That part of the lugs 8, 9 of the flat connector plate 6, which is located in the neighborhood of the slot 5 in the profiled string 1, is in sliding engagement with the mutually facing slot walls 5', while the bottom part of said plate 6, which extends outside to the slot 5, carries at the locations 11 an insulator 12 to which traction elements 13, e.g. a chain, of a load device of arbitrary kind which has not been shown, are attached, the supply conductor to said load device, consisting of a cable 14, being taken through the insulator 12 at 14' and electrically connected with the flat connector plate 6.

In the embodiment shown in FIGS. 1, 2 and 3, the slide 3 is in the form of a carrier for a wiper contact 16, supported through a spring 15, made of graphite or some similar conductive material, the supporting spring 15 doing duty simultaneously as the electrical conductor which establishes connection between the flat connector plate 6 and said wiper contact 16. The supporting spring 15 is arranged between the guiding tips 3' of the slide and secured by screws 17 to the wiper contact 16.

In departure from the example shown in FIGS. 1 to 3, in which the conductor 4 is in the form of a straight, round-sec-

tion wire and, to prevent it from falling out, has a cross section larger than the width of the slot 5 formed in the underside of the collector line duct, the conductor can equally well be embodied as a round-section wire 18 extending in serpentine fashion transversely of the plane of the slot, between the sidewalls of the collector line duct, said wire having the peaks of its serpentine convolutions 18' located in grooves 19 in the collector line duct 1 (see FIGS. 4 and 5). Yet again in departure from this the conductor can also take the form of a flat strip 21 (FIG. 8) extending along the top internal wall of the collector line duct 1 and located by its edges in grooves 20 in the sidewalls of the duct 1.

Still again, it is possible in the manner shown in FIG. 9 to constitute the current conductor as a profiled liner 22 covering the internal surfaces of the duct 1.

In FIGS. 6 and 7 modified slides 23, 24 have been illustrated in section, which themselves do duty directly as wiper contacts in association with two current conductors 25 or 26 respectively in the collector line duct 1. The subsidiary conductors 25 of FIG. 6 are in the form of flat strips and are laid in grooves 25' formed in the internal face of the underside of the duct 1, in which the slot 5 is formed, while the subsidiary conductors 26 in FIG. 7 are of angled design.

The assembly of this embodiment of the invention is effected by first of all arranging for the collector line duct 1, which may already contain its current conductor, to be unreeled directly on sight from a transporter drum or the like, and cut to length. Possibly, it may only be at this stage that the current conductor, itself cut to a length corresponding to the cut profiled section string, is introduced as a whole into the duct. The duct of the embodiments of FIGS. 1 to 9, provided at its top side with laterally projecting mounting flanges 27, will for example be secured to a workshop roof or ceiling, a supporting rail or beam 28 or the like, using fixing elements 29, and at the same time bent to accord with the desired routing, and this can be carried out without having to exert any appreciable force because of the flexibility of duct 1 and the conductor. Subsequently, the current pickup device is inserted at one of the opened ends of the duct and coupled to the load device. After closing off the ends and connecting the current conductor or conductors to a current source, the arrangement is ready for operation.

In the example of FIGS. 10 to 21, the collector line duct 30 is likewise in each case in the form of a one-piece injection-molded, profiled section string of synthetic material, however here it is intended to have a relatively high inherent stiffness although still leaving the duct with a certain degree of flexibility. The cross-sectional profile of each duct is substantially rectangular, the width: height ratio being approximately 1:2. The illustration in the drawing reproduces the dimensions of the component more or less full size. As the drawing shows, the dimensions of each collector line duct 30 are relatively small so that these ducts have very little bending resistance when deformed to negotiate curves, even where the material strength is high, so that the production in the horizontal plane of curves having a radius of about 2½ meters and in the vertical plane of curves having a radius of about 5 meters can be effected without any heating or plastic deformation.

In order to form upper and lower assembly lips 31 and 32, the sidewalls of the collector line ducts are extended a short distance upwards and downwards. At their top sides, the ducts 30 have a mounting rail which, like the assembly lips 31, 32, extends axially over the full length of the profiled section string and is in the form of two angled sections 33, 34, whose main legs extend in planes parallel to the sidewalls and merge at their other ends into mutually opposite lips which present between them a slot for the introduction of screw shanks 35 or the like.

The wall sections forming the underside of the collector line ducts are additionally provided along those of their edges which present the slot with output-angled guide lips 36, for pressing a current pickup device.

On the inside of the opposite sidewalls of the collector line ducts 30, in order to partition an area for the introduction of a current conductor 37, longitudinal projections 38 are provided which form an edge groove in which the conveniently jig-jaz shaped wire forming the conductor 37, can be located. On those of their faces presented towards the bottom of the duct, these projections 38 are chamfered in order to facilitate mounting the conductor 37 in its working position. The conductor can be slid directly into its working position above the projections 38. Where long strips of profiled section are involved, however, this means the development of considerable tensile and compressive loadings on the conductor so that in such instances it is necessary first of all to introduce the conductor into the main space of the duct and then, using a mandrel, slide or similar tool move progressively along the duct, to force the conductor into its working position past the projections 38.

FIGS. 13 and 14 depict in cross section, the side-by-side arrangement of six collector line ducts 30 which are supported at intervals by a bracket 39 through the medium of screws 40 and the mounting rails 33, 34. In order to hold the collector line ducts 30 together, clamping strips 41 of double-T-shaped cross section are provided, whose flanges 42 merge into lips 43 formed at right angles, through which lips they engage behind the corresponding lips 31, 32 on neighboring collector line ducts 30, to lock them together. The clamping strips 41 can extend parallel between the strings of profiled section and have the same length thereas, so that in each case they attach together two neighboring collector line ducts virtually in jointless fashion and in fact conceal the joints between them, although they can equally well be used locally as distance pieces, extending only over part of the length of the collector line ducts.

The picking-up of current from the particular conductor 37, in each case constituting a single current pole, is effected via a pickup device slidably supported inside each collector line duct, said device here comprising, as FIG. 11 shows particularly clearly, a carbon pickup 44, a spring 45 supporting the latter in free floating fashion at its underside, a slide plate 46 acting as support for the spring 45, a vertical connector plate 47 fixed to the underside of the slide plate 46 and doing duty as the electrical connector also, and an insulator generally indicated at 48, which is attached to the connector plate 47.

The carbon pickup 44 is a relatively elongated, narrow component and is provided at its front and rear ends, considered in the direction of movement of the pickup device, with oblique formations 49 and 50 respectively, like a sledge runner, this enabling it to slide along the conductor 37 without snagging or fouling. The carbon pickup 44 is located in a mounting 51 of brass for example, to which the spring 45 with its multiple serpentine convolutions, is, for example, soldered. The other end of the spring 45 is correspondingly attached to the slide plate 46 which is likewise curved at each end like a sledge runner and has its ends tapered widthwise. The slide plate 46 slides directly on the wall sections forming the underside of the collector line duct 30, the finlike connector plate 47 extending outwards through the slot in the duct. The connector plate 47 is guided between the edges of the wall portions defining the slot, these edges being enlarged in area by the provision of the guide lips 36. The slot width can be very small indeed, for example, in the order of 1 or 2 millimeters.

The insulating body 48 consists in detail of two half sections 52 and 53 in the form of plastics injection moldings, which can be attached to one another in detachable fashion, by transverse screws. Corresponding bores for receiving said transverse screws, have been marked 54. The transverse screws themselves are marked 55. The two half sections 52 and 53 accommodate between them the connector plate 47 which, at its bottom end, is provided with oppositely bent lugs 56 through which it engages in the material of the insulator.

Outside the collector line ducts, there is soldered to the connector plate 47 and end 57 of a feeder cable 58 from the load device, said cable extending through a downward-pointing ex-

tension 60 of the insulator 48 to the connector plate 47 and being located and secured between the half sections 52 and 53 of the insulator 48 in a guide passage 59 delimited between the two. The top of the insulator 48, facing the underside of the collector line duct 30, is cut away obliquely in sledge runner fashion, in the neighborhood of its front and rear ends. These oblique surfaces are marked 61 and 62 and are designed in particular to facilitate the negotiation of junctions ("-switchpoints"). Furthermore, the topside of the insulator 48 is provided with upward-projecting profiled ribs 63, disposed parallel to the axis of the duct, which embrace the guide lips 36 at either side of the slot, since they extend between said lips 36 and the mounting lips 32.

As FIGS. 14 to 16 show in greater detail, each current conductor 37 in a collector line duct is provided with a separate supply facility. The supply line 64 taken to each collector line duct 30, opens into a junction box 65 which is secured by screws to the top of each collector line duct, using the mounting rails. Each junction box 65 consists, in detail, of two half sections 66 and 67 which adjoin one another with the joint parallel to the axis of a duct and are connectable with one another by means of transverse screws in respect of which the sections contain transverse bores 48. The sections 66 and 67 delimit between them cable guide passages 69 in which the ends of the supply lines 64 are held. The passages 69 are arcuate in form in order by this means to provide the cable 64 with additional resistance. At the same time, this avoids any upward-facing opening through which dirt or the like could penetrate into the inside of a collector line duct 30.

FIG. 15 illustrates in detail a so-called center-feed arrangement in which the end 70 of a feeder line 64 is soldered to a through conductor 37. In order to introduce the feeder line 64 into the inside of the collector line ducts 30, the latter are provided in the neighborhood of the input location, and concealed beneath the junction box 65, with an opening 71 which, in the case of FIGS. 15 and 16, is for example triangular in shape, viewed from the side, and extends to some degree into the sidewalls. This opening 71 is covered over by the clamping strips 41 at the side of the particular adjoining collector line ducts. In order to secure these clamping strips 41, each junction box 65 is provided at its underside with tongues or lips 72 which bear from above upon the flanges of the clamping strips 41 and hold them in position as soon as the screws 73, which secure the box 65 to an assembly rail, have been pulled up tight. The supply or feed arrangement of FIG. 16 corresponds substantially to that of FIG. 15, although in this case two feeder lines 64 have been provided, each of which, with its ends 70, is soldered to the conductor 37, the latter being interrupted between both soldered junctions and thus forming an insulation point. FIGS. 17 to 19 illustrate various views of the detailed design of a joint or junction. In the neighborhood of this junction, in each case at either side of a collector line duct a short section of clamping strip 41' is provided with extends a certain direction to either side of the joint line 74 and conceals it. The actual junction is secured by axial connecting pieces 75 which can be attached by screws 76 at either side of the joint line 74, to the ends of the sections of collector line duct 30. At their bottom ends, the connecting pieces 75 exhibit downward-projecting axial lips 77 which, when the screws 76 are tightened up, bear down from above upon the flanges of the clamping strips 41' and hold same in position. Together with full insulation of the junctions, the connecting component 75 together with the clamping strips 41' enable accurate alignment to be achieved between abutting ends of collector line duct sections.

FIGS. 20 and 21 illustrate a feature which can be employed in particular in the context of current pickup devices of the aforedescribed and illustrated kind, although it is in no way limited to these. FIG. 20 shows a simplified cross-sectional view of collector line ducts 30 of the described kind, and in this example three single-pole ducts have been combined to form a supply unit. A fourth duct 30', the cross-sectional profile of which is identical to that of the others, constitutes a control duct in which, likewise, a current pickup device of the aforedescribed kind slides. However, at its externally disposed side the control duct 30' contains small access slots 78 arranged at intervals, these opening at above the level of the working position of the conductor 37, into the inside of the duct. The intervals between these access slots 78 will conveniently be less than the effective length of contact of the carbon pickup 44. The control duct will conveniently be provided over its entire length with spaced access slots 78 of this kind. However, it is equally possible instead, to provide individual ones or a group of slots 78, simply over a certain length of the control duct 30'. The slots 78 enable contact lugs to be inserted into the interior of the collector line duct, these lugs passing the current pickup device and coming into engagement with the carbon pickup 44. FIG. 21, at the left hand side, illustrates a contact lug 79 with a single extension, while at the right hand side a contact lug 79' with two extensions projecting into the interior of the control duct, has been shown. The contact lugs 79, 79' are attached to control lines 80, e.g. through the medium of plugin connections, although the latter may equally be replaced by soldered connections or the like. At least in that side in which the contact lugs 79 are located, the conductor 37 is recessed in the control duct 30'. When a carbon pickup comes into contact with a control lug 79, a control circuit is closed via the conductors 80 and the feeder line associated with the pickup device, so that a control pulse is fed to the load device. It is only a single lug which is provided, then the control pulse will be a short one, this being fed to the load for control purposes of all kinds, e.g. to slow it, to accelerate it, to stop it, etc. If a corresponding number of contact lugs is provided, and it is possible to supply to the load over an arbitrary distance, control impulses of similar or for that matter differing kind.

In order to conceal the contact lugs and the control lines, a cover profile strip 81 is provided which in association with the sidewall of the control duct 30', forms a closed cavity 82. This cover strip 81 is likewise in the form of an injection molded synthetic material component and will conveniently be made up from lengths of between 1 and 4 meters, so that a modification to the control circuits requires only minor dismantling operations. At its attachment edges, the cover strip 81 has locking flanges 83 through the agency of which it locks behind the mounting lips 31, 32 on the control duct 30'. The cover strip 81 is provided internally with a rib 84 which extends at an interval from the wall of the control duct, down to beyond the level of the slots 78, engages behind the contact lugs and locks the latter in their inserted position as soon as it is fitted.

I claim:

1. A current-supply arrangement for a mobile load device, comprising a member of hollow-sectioned profile forming a collector line duct carrying an electrical conductor and a current pickup device movable therein which is connected with the load device through a traction and connecting element extending outside said member through a slot formed in the bottom face of its hollow-sectioned profile, wherein the collector line duct is in the form of a flexible string and accommodates a flexible conductor of corresponding length, forming a single current-supply pole, the conductor being in the form of a wire arranged in serpentine fashion transversely of the plane of the slot and between the sidewalls of the collector line duct, the peaks of its convolutions being located in internal grooves in said duct, and the current pickup device comprising a slide carried in the collector line duct and arranged to be guided thereby.

2. An arrangement as claimed in claim 1, wherein the conductor is in the form of a round-sectioned wire.

3. An arrangement as claimed in claim 1, wherein the collector line duct has mounting flanges extending over its full length and formed substantially as extensions of its sidewalls so as to project upwards and downwards.

4. An arrangements as claimed in claim 1, wherein the wall sections forming the underside of the collector line duct are provided with guide lips along the edges delimiting the slot.

5. An arrangement as claimed in claim 1, wherein the slide is guided by the internal walls of the profiled section string and has rounded front and rear ends.

6. An arrangement as claimed in claim 5, wherein the rounded ends in each case have the general shape of an ellipsoid.

7. An arrangement as claimed in claim 5, wherein, by way of a slide attached to the current pickup device, a plate with ends bent up after the manner of a sledge runner, and tapered widthwise, is provided.

8. An arrangement as claimed in claim 1, wherein the traction and connecting element is formed by a flat connector plate made of electrically conducted material, the plate simultaneously doing duty as an electrical conductor, and the plate is secured in axis-parallel fashion to the slide, that zone of the plate which is located in the neighborhood of the slot in the profiled section string being in sliding engagement with the slot walls and that zone thereof which is outside the slot carrying an insulator to which the traction elements of the load device are secured, the feeder conductor of said load device being taken through the insulator and being electrically connected to the flat connector plate.

9. An arrangement as claimed in claim 8, wherein the slide is designed as a carrier for a wiper contact spring loaded in relation thereto, the spring being an electrically conductive component and establishing contact between the flat connector plate and the wiper contact.

10. An arrangement as claimed in claim 9, wherein a carbon pickup or wiper contact is secured to the slide plates by means of a spring having serpentine convolutions.

11. An arrangement as claimed in claim 10, wherein the carbon pickup is in the form of a component of elongated axial form having end portions sloping away from the conductor at the side facing the conductor.

12. An arrangement as claimed in claim 8, wherein the wall sections forming the underside of the collector line duct, are provided with guide lips along the edges delimiting the slot and the insulator of the current pickup device is provided at its side facing the slot walls with profiled strips which embrace the guide lips laterally and at an interval, at either side of the slot.

13. An arrangement as claimed in claim 12, wherein the insulator consists of two half sections in the form of injection molded components releasably attached to one another with a vertical split line disposed in the direction of travel of the current pickup device, the two half sections accommodating between them the flat connector plate which does duty as the electrical connector.

14. An arrangement as claimed in claim 12, wherein the topside of the insulator, facing the underside of the collector line duct is of a sledge runner shape, having front and rear transitional regions, sloping away from the collector.

15. An arrangement as claimed in claim 13, wherein the insulator has a central downward projecting extension locating and fixing the end of a feeder cable to the load device the cable being arranged in a guide passage formed between said two half sections of the insulator.

16. An arrangement as claimed in claim 1, wherein the slide itself is designed directly as a wiper contact and engages directly with the conductor in the collector line duct.

17. An arrangement as claimed in claim 1, wherein the collector line duct is provided along its top side with a mounting rail in the form of two angled sections which present mutually opposite inwardly directed lips which define an undercut mounting slot.

18. An arrangement as claimed in claim 1, wherein the attachment of a conductor to a feeder line is effected via an opening in the top side of the collector line duct, above said opening there being mounted a junction box which closes the opening off.

19. An arrangement as claimed in claim 18, wherein the junction box consists of two half sections in the form of injection molded components releasably attached to one another with a joint plane located in the direction of travel of the current pickup device, the two half sections accommodating between them one or more feeder line cables in guide passages formed between the sections.

20. An arrangement as claimed in claim 17, wherein in order to bridge a junction between sections of the collector line duct, short clamping strips are provided, which are placed over the joint line and extend to either side of a collector line duct, the abutting ends of the collector line duct sections being connected with one another by axial connecting components fixed to their mounting rails said connecting components being provided with extension lips which bear from above upon the flanges of the clamping strips and secure them in position.

21. An arrangement as claimed in claim 1, modified in that for control purposes the collector line duct is provided in substitution for said electrical conductor substantially at the level at which the electrical conductor runs, with a plurality of access slots arranged at intervals in one sidewall, via which in each case an electrical contact lug connected to a control line can be inserted, said lug in association with said pickup device being arranged to close a control circuit for the load device.

22. An arrangement as claimed in claim 21, wherein the collector line duct doing duty as control duct is closed off at its side containing the access slots, by a profiled strip of synthetic materials which, together with the sidewall of the duct, forms a closed passage for the accommodation of the control line.

23. An arrangement as claimed in claim 22, wherein the collector line duct has mounting flanges extending over its full length and formed substantially as extensions of its sidewalls so as to project upwards and downwards and the cover strip engages in interlocking fashion behind the mounting lips of the collector line duct through the medium of locking lips which extend along the seating edges of the cover strip.

24. An arrangement as claimed in claim 22, wherein the cover strip has an internal rib extending along it, which engages behind the contact lug or lugs and secures them in their access slots.

25. An arrangement as claimed in claim 1, comprising a plurality of said single-pole collector line ducts, complete with their particular related current pickup devices combined in side-by-side relation to form a parallel, multipole current supply unit.

26. An arrangement as claimed in claim 25, wherein the collector line duct has mounting flanges extending over its full length and formed substantially as extensions of its sidewalls so as to project upwards and downwards, and in order to connect together two collector line ducts at a time, clamping strips of synthetic material and having a substantially double-T-shaped cross section are provided, lips of which, projecting inwards at right angles from the flanges, in each case engage behind the four mounting lips of two neighboring collector line ducts in order to lock them together.

27. An arrangement as claimed in claim 25, wherein an outside one of the collector line ducts is modified for control purposes in that it is provided, in substitution for its electrical conductor substantially at the level at which the electrical conductor runs, with a plurality of access slots arranged at intervals in its outside wall, via which in each case an electrical contact lug connected to a control line can be inserted, said lug in association with said pickup device being arranged to close a control circuit for the load device.

28. An arrangement as claimed in claim 27, wherein the collector line duct doing duty as control duct is closed off at its side containing the access slots, by a profiled strip of synthetic material which, together with the sidewall of the duct, forms a closed passage for the accommodation of the control line.

29. An arrangement as claimed in claim 28, wherein the collector line duct has mounting flanges extending over its full length and formed substantially as extensions of its sidewalls so as to project upwards and downwards and the cover strip engages in interlocking fashion behind the mounting lips of the collector line duct through the medium of locking lips which extend along the seating edges of the cover strip.

30. An arrangement as claimed in claim 28, wherein the cover strip has an internal rib extending along it, which engages behind the contact lug or lugs and secures them in their access slots.

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