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[31] **34942/68**

[54] **INPUT CONNECTOR FOR ELECTRIC DISTRIBUTION TRACKS**
2 Claims, 1 Drawing Fig.

[52] **U.S. Cl.** ..... **339/14 R,** 339/22 B
[51] **Int. Cl.** **H01r 3/06**
[50] **Field of Search** ..... 339/14, 21, 22, 23, 174; 200/51; 174/99 B

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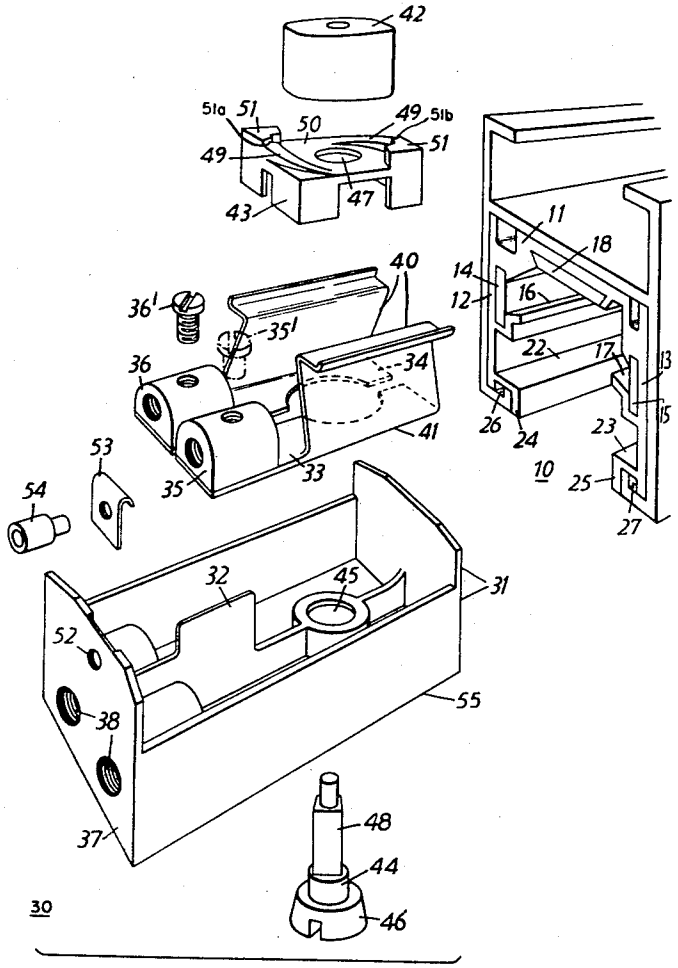
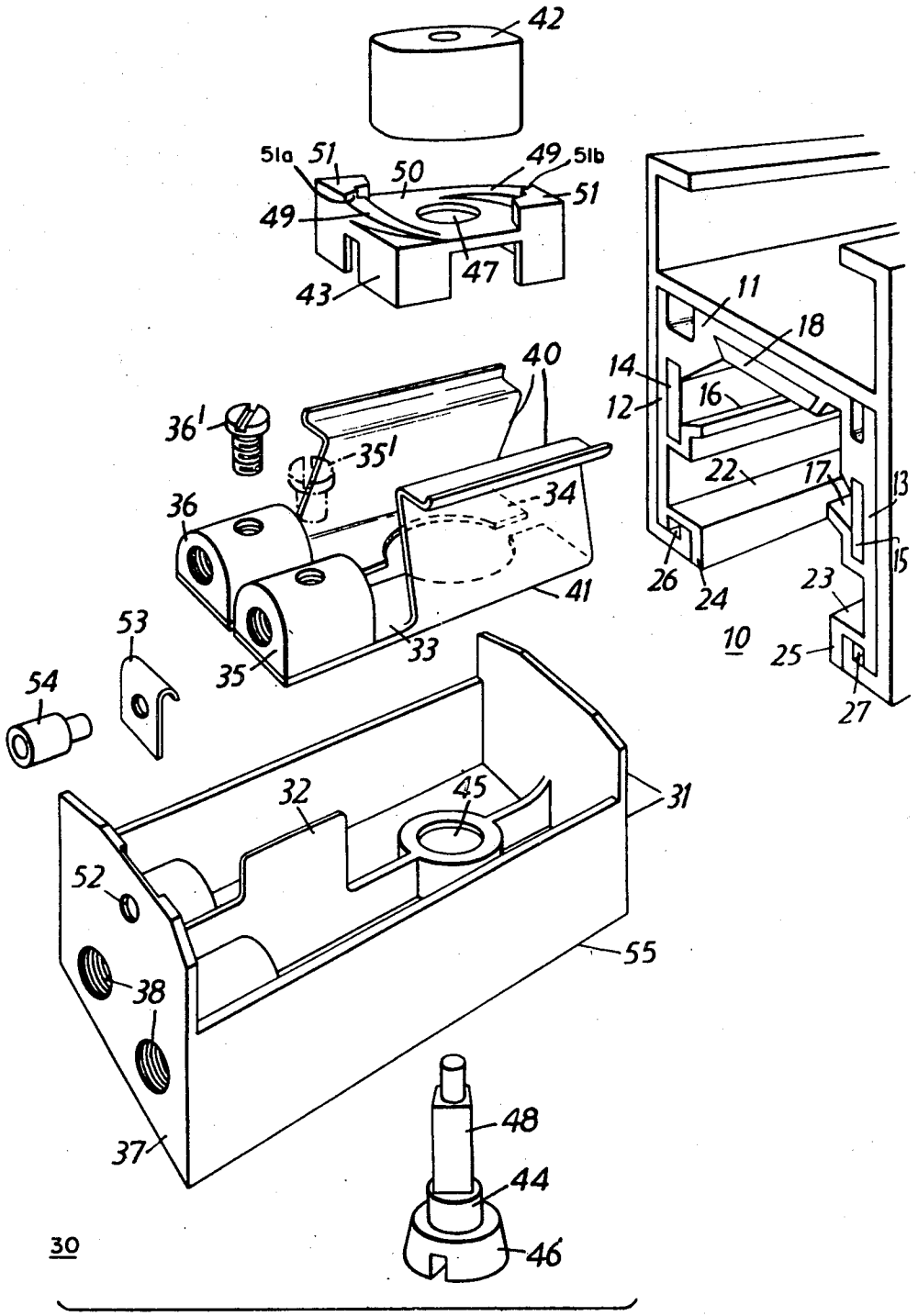
ABSTRACT: An input connector for connecting a distribution track to an electricity supply has a pair of movable conductor elements provided with terminals for wiring to the supply, the input connector having a cam assembly, for moving the conductor elements into a position in which the conductor elements (i) make contact with exposed track conductors housed in the distribution track and (ii) clamp the input connector to the track.





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INPUT CONNECTOR FOR ELECTRIC DISTRIBUTION TRACKS

The present invention relates to an input connector for electric distribution tracks. The input connector allows a mains electricity supply to be readily applied an electric distribution track of the type which houses bare track conductors. The connector is particularly, although not exclusively, suitable for use with a distribution track such as the one described in our copending application of even date entitled: "Track for Distribution of Electricity" Ser. No. 827,656, now U.S. Pat. No. 3,546,367.

According to the present invention, there is provided an input connector for an electrical distribution track in which bare track conductor elements are carried, the connector comprising a casing in which a pair of conductor elements are mounted side by side, the conductor elements being insulated from one another and having terminals for connecting input leads thereto, means being provided to move the conductor elements into abutment with the track conductors to provide electrical contact and to clamp the connector to the track.

The use of the input connector avoids the necessity of making more-or-less permanent connections of a mains supply cable to the track. The only permanent connections necessary are between leads of the mains supply cable and the terminals of the input connector. The input connector can be readily locked to and release from the track. Furthermore, the input connector can be locked to the track at any convenient location along the track, normally adjacent a mains supply outlet. Electrical connection of the leads of the mains supply cable and the track conductors is obtained by means of conductor elements carried by the input connector. The conductor elements are movable into engagement with the track conductors when input connector is positioned on the track. Preferably the movement of the conductor elements is controlled by a cam which is operable from the exterior of the input connector. When the conductor elements are in contact with the track conductors, the input connector is clamped to the track. In addition, the connector will preferably include a separate contact element so that an earth line can be connected to a further conductor carried by the track.

The present invention will now be described by way of example with reference to the accompanying drawing, which is an exploded perspective view of an input connector and part of an electric distribution track.

For clarity, a brief description of an electric distribution track will be given. The track **10** consists of an elongate member which is, for example, an extrusion of a plastics material such as P.V.C. The track has a base **11** and sides **12, 13** extending perpendicularly from the longitudinal edges thereof. The sides **12, 13** include housings in which track conductor strips **14, 15** are carried. The track conductors **14, 15** are accessible from the inner region of the track **10** by way of slots **16, 17**. A further track conductor **18** is supported in the base **11** of the track **10**, and is used to provide an earth line. The sides **12, 13** of the track **10** additionally include flanges **22, 23** which are located remote from the base **11**, and which project inwardly from the sides **12, 13**. As viewed in the drawing, the flanges **22, 23** have downwardly projecting extensions **24, 25**, so that a pair of grooves **26, 27** are formed between the extensions **24, 25** and the sides **12, 13**. The flanges **22, 23** and the grooves **26, 27** extend longitudinally along the track **10**.

The input connector **30** shown in exploded perspective includes a casing **31** which is made from a rigid plastics material such as P.V.C. The casing **31** has a central dividing wall **32** which separates the casing into two compartments. A pair of conductor elements **33, 34** are provided, one of which is mounted inside each of the compartments. The conductor elements **33, 34** are therefore kept insulated from one another by the dividing wall **32**. The conductor elements are made from a resilient material such as brass, and each carries a barrel-type screw connector **35, 36** with associated screws **35', 36'**. An

end face **37** of the casing **31** is provided with apertures **38** so that leads of a main supply cable (not shown) can be inserted through the wall **37** for clamping in the barrel connectors **35, 36**.

As will be seen from the drawing, the conductor elements **33, 34** are bent to form contact fingers **40** for engaging the track conductors **14, 15**. The conductor elements **33, 34** are additionally bent remote from the contact fingers **40**, at **41** in the drawing, so that the distance between the contact fingers **40** is less than the distance between the track conductors **14, 15**. When the input connector **30** is positioned on the track **10** the contact fingers **40** are moved apart from their innermost positions so that each contact finger **40** touches its associated track conductor.

The contact fingers **40** are moved apart by means of a cam arrangement which is operable from the exterior of the casing **31**. The cam arrangement is constituted by a generally elliptical cam **42**, a cam seat **43** and a camshaft **44**. The cam arrangement is assembled within the casing as follows. The camshaft **44** is passed through an aperture **45** provided in the base of the casing **31**, so that the head **46** of the camshaft **44** is accessible from the exterior of the casing **11**. The head **46** of the camshaft is slotted so that the shaft may be rotated by means of a screwdrive or the edge of a coin. The cam seat **43** is then positioned in the casing **31**, on top of the conductor elements **33, 34**. A further aperture **47** is provided in the cam seat **43** through which the camshaft **44** extends. The cam **42** is then positioned on a square portion **48** of the camshaft **44**. The cam **42** can be retained on the camshaft **44** by conventional means such as spreading the end of the cam shaft **44**. Otherwise, the cam can be retained on the camshaft **44**, for example by using a circlip (not shown). The cam **42** and its associated cam seat **43** are made from insulating, plastics materials such as acetal. A pair of arcuate-inclined surfaces **49** are formed on the surface of the cam seat **43** which contacts the cam **42**. The inclined surfaces project from the surface **50** of the cam seat **43** to the raised portion **51**, which includes surfaces **51*a*, 51*b***, forming rotational limit stops for the cam **42**. When the camshaft **44** is rotated so as to align the cam **42** with its major axis across the housing **31**, the cam **42** moves the contact fingers **40** apart laterally, against the bias of the conducting elements **32, 33**, into an "on)" position. The required rotation is therefore anticlockwise as viewed from above. The conducting members **32, 33** bias the cam seat **43** into abutment with the base of the cam **42**, so that on rotation, the cam rides on the inclined surfaces **49**. The cam is locked in the "on" position by flats formed on its camming surface which engage the contact fingers **40**, and further rotation in the same direction is prevented by the limit stop **51*a***. If the cam **42** is now rotated through approximately 90° in a clockwise direction, it rides over the inclined surfaces **49** thus moving the cam seat **43** in a downward direction along the camshaft **44** against the bias of the conducting members **32, 33**, which exerts a corresponding camming action on the contact fingers **40**. The 90° rotation aligns the cam **42** with its major axis parallel to the longitudinal axis of the housing **31**, the contact fingers then being in their innermost or "off" position. Further rotation in this direction is prevented by the limit stop **51*b***. Operation of the cam assembly therefore causes a lateral movement of the contact fingers **40**, together with up-and-down movement thereof caused by the camming action effected by movement of the cam seat **43** along the camshaft.

As will be seen from the drawing, the end face **37** of the casing **31** also includes an aperture **52**, through which an earth lead of a mains cable can be threaded. A contact member forming an earth spring **53** is so positioned on the casing **31** a as to touch the further track conductor **18** when the input connector is clamped to the track **10**. The earth lead is connected to the earth spring **53** by means of a bush **54** in which the lead is clamped, for example with a grub screw.

Although not shown in the drawing, the casing **11** can include a pair of flanges on the lower long edges **55** of the casing. The flanges can be so formed as to engage in the grooves **26, 27** which extend longitudinally along the track **10**.

To supply power to the track conductors **14**, **15** the mains supply leads are connected to the input connector **30** as described. The cam shaft **44** is rotated to bring the cam **42** into a position in which the contact fingers **40** are in their innermost position. The input connector is then pushed up into the track **10**. The cam shaft **44** is rotated through 90°, so that the cam **42** moves the contact fingers **40** apart. When so moved, the contact fingers project through passages **16**, **17** of the track **10** to touch the track conductors **14**, **15**. The cam **42** locks in this position, as described above. The input connector **30** is clamped to the track **10** when the contact fingers touch the track conductors, and is prevented from disengaging with the track **10** by abutment of the contact fingers **40** with the lower surfaces of the passages **16**, **17**. The input connector **30** is released from the track **10** by rotating the cam allowing the contact fingers to retract into their innermost positions out of engagement with the track conductors, **14**, **15**. It will be appreciated that, although the clamping means is constituted by the cam assembly and the contact fingers, separately operable clamping means could be used. The input connector can be clamped to the track at my

We claim:

1. An input connector for an electricity distribution track in which exposed track conductors are housed, the input connector comprising:

a casing,

a pair of conductor elements, insulated from one another which are mounted within said casing,

input terminals on said conductor elements for connecting input leads thereto, and

a cam assembly operable from the exterior of the casing for moving said conductor elements between inner and outer positions,

whereby said conductor elements, when moved apart to their outer positions, clamp the input connector to the track with said conductor elements in contact with the track conductors,

said cam assembly comprising a cam, a camshaft a and a cam seat mounted for movement along the cam shaft, said cam seat being biased against the cam by said conductor elements, and said cam seat having a pair of arcuate-inclined surfaces for coaction with said cam, whereby rotation of said cam, in addition to causing lateral movement of the contact fingers between their inner and outer positions, effects a camming action on said conductor elements by allowing movement of said cam seat along the camshaft.

2. An input connector according to claim **1**, wherein said cam seat includes rotational limit stops for said cam.