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E. POTTERIN

3,314,041

DEVICE FOR CONNECTING CONDUCTORS

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Fig. 1

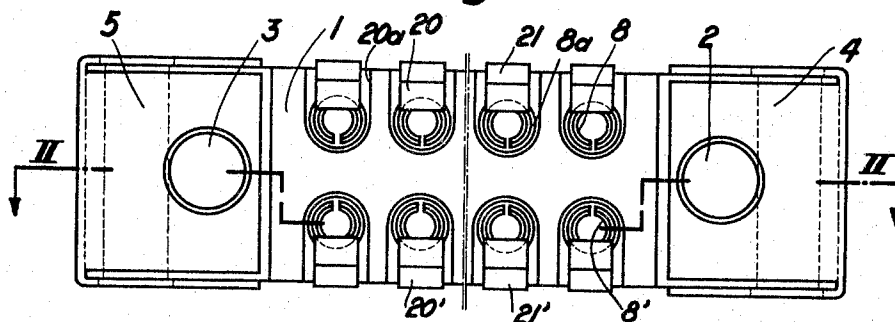


Fig. 2

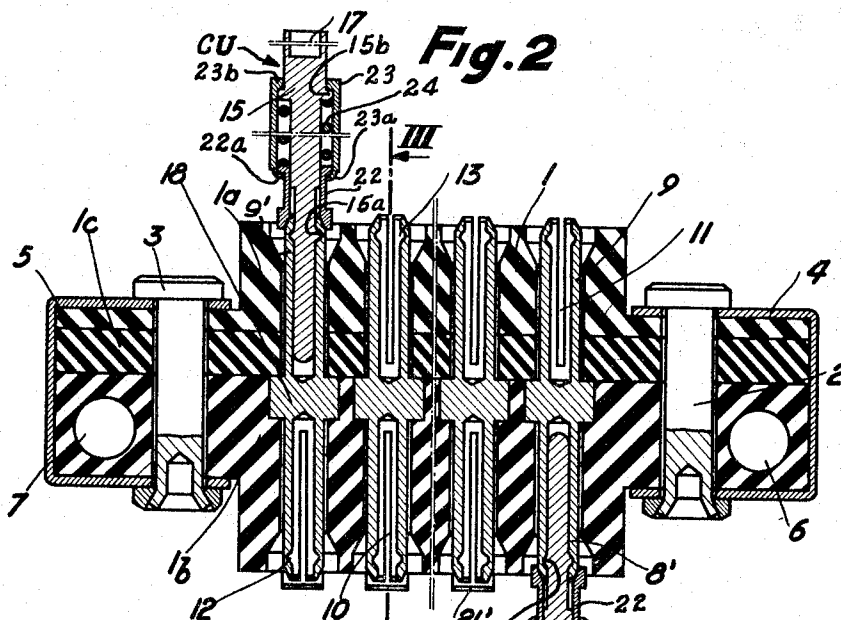
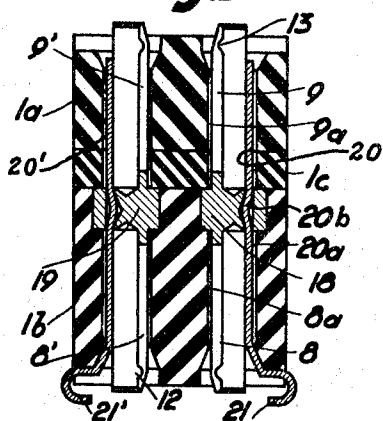


Fig. 3



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DEVICE FOR CONNECTING CONDUCTORS

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5 Claims. (Cl. 339—91)

This invention relates to a device permitting the connection of electrical conductors provided at least one of their ends with a male connecting means adapted to be engaged and detachably locked in a conductor pin mounted in an insulating support. The invention also relates to supports comprising any number of such pins and adapted to serve for the appropriate connection of conductors.

Multiple or single socket outlets intended to provide a fluid-tight passage for conductors through partitions separating media of different nature or in which different thermodynamic conditions prevail are known. One known type of such outlet equipment comprises essentially at least one pin composed of two parts and embedded in an insulating member, an intermediate member providing a conducting connection between the said two parts and locked in the insulating member and in each part of the pin and a male connecting member at one end of which the electric cable which is to be electrically connected through the partition is fixed by any suitable known means, the other end of the male connecting member being engaged by a tight frictional fit with the corresponding pin part, each male member being surrounded by an insulating sleeve slidable elastically in the direction of the axis of the pin so as to lock said male member against the head of the pin part, thus sealing and securing the connection.

The invention, which likewise utilises an insulating support and at least one conductor pin, is more particularly characterised by the fact that a conducting member is disposed in a milled recess or cavity, of substantially co-operating shape, provided in that socket of the insulating support in which the conductor pin is inserted by force, and projects at least on one face of said support, said conducting member having at least one point of permanent contact with the pin with which it is associated.

According to a preferred embodiment of the invention, the conducting member has the form of a plate which is inserted in a longitudinal recess milled in the pin socket and contacts the pin and/or the intermediate member within the socket.

The invention is not limited to the utilisation of the above described pins and male connecting members. The invention is in fact applicable to any connection device capable of effecting detachable locking of the end of an electric wire or cable on a pin or other conducting sheath accommodated inside an insulating support or plate.

The invention enables an insulating assembly to be produced which contains a plurality of conducting pins and on at least one face of which insulating assembly conducting members associated with the pins project. Nevertheless, it is possible to provide insulating supports in which the pins are only partly associated with conducting members. The purpose of such members is to enable conductors to be connected as required, because by connecting the projecting parts of certain determined members or plates it is possible to shunt the corresponding conductor passages. In order to connect these projecting parts it is possible to make use of any suitable means, and in particular to use conducting plates, clips, or other similar conducting members.

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It is obviously advantageous to provide regular distribution of the pins in the insulating support, so that the metal parts which are associated with them may be in the form of the same type of conducting member (plates, clips, wires, etc.).

The plate or support according to the invention may also be disposed inside a casing, the inlet and outlet for the conductors being provided on the casing.

By way of illustration but without limitation there is described below one embodiment of the invention, with reference to the accompanying drawings in which:

FIGURE 1 shows a plan view of an insulating plate with a certain number of pins according to the invention;

FIGURE 2 is a section along the line II—II in FIGURE 1;

FIGURE 3 is a section along the line III—III in FIGURE 2.

The plate illustrated in the drawings is composed essentially of an insulating support 1 in which conductor pins 8, 9 and 8', 9' are accommodated. For practical reasons, particularly in order to facilitate manufacture or assembly, the support 1 is here formed of two parts 1a and 1b disposed one on each side of a plate 1c, the resulting assembly being fastened by two end bolts or rivets 2 and 3, with the interposition of rigid packings 4 and 5. Holes 6 and 7 drilled at each end of the plate enable the connector constructed in this manner to be fastened on any suitable casing or board.

The pins comprise two identical members for example 8, 9 of a thin conducting material, which are split longitudinally at 10, 11 over part of their length and thus have a certain elasticity. Each of the pins 8, 9 has a recessed internal clearance 12, 13 of spherical or oval shape, in which the corresponding outer bearing surface 14a, 15a of a male connecting member 14, 15 is engaged. The mounting of such male members 14, 15, etc., is illustrated in FIGURE 2, this arrangement effecting the detachable locking and fixing, respectively, on the pins 8, 9 of electric cables or wires at 16, 17 etc. The hollow end parts of the pin members 8, 9 which are mounted in alignment with one another are connected electrically by intervening metal parts 18, 19. According to the invention, metal parts or members 20 as shown in FIGURE 3 are associated with all or part of the pins 8, 9 and in the example illustrated are in the form of plates inserted in a milled recess 20a of longitudinal cooperating shape, provided in the socket 8a, 9a in which the pins 8, 9 are inserted by force. On at least one face of the support, these plates 20 have projecting parts 21 which can be connected together by any electrical connection means, not illustrated, in order to enable the pins and corresponding conductors to be shunted as desired.

As shown in FIGURE 2, each male conducting member 14, 15 is a conducting stem forming a component of a connector unit CU. These units being the same, a description of the unit including the stem 15 as a component will suffice. A first sleeve 22 is slidably mounted on the stem 15 and has an inner end engageable with the end part of the pin 9' when the free end of the stem 15 is inserted into the pin. At its outer end, the sleeve 22 is formed with an external flange 22a lying within a second sleeve 23 which is slidable on the stem 15 relatively to the first sleeve 22. The inner end of the sleeve 23 has an internal flange 23a engageable with the external flange 22a on the sleeve 22, and the outer end of the second sleeve 23 has an internal flange 23b engageable with an external flange 15b on the stem 15. A compression spring 24 is interposed between the external flange 15a on the stem 15 and the first sleeve 22 for urging the latter longitudinally of the stem 15 toward the free end of the latter and into contact with the end of the hollow pin 9'.

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In operation, the connecting of the unit CU to the pin 9' may be effected by inserting the stem 15 into the pin 9' while grasping either the stem 15 itself or the second sleeve 23. In either case, the bearing surface 15a on the stem 15 will be inserted into the clearance 13 in the pin 9', and the inner end of the first sleeve 22 will be forced into spring loaded contact with the outer or exposed end of the pin 9'. The cooperating flanges 22a and 23a at the outer end of the first sleeve 22 and the inner end of the second sleeve 23 limit movement of the sleeve 22 relative to the sleeve 23 toward the free end of the stem 9'; and the cooperating flanges 23b and 15b at the outer end of the sleeve 23 and on the stem 15 limit movement of the sleeve 23 relative to the stem 15 toward the free end of the latter.

As indicated in FIGURE 2, when the stem 15 has been driven home into the hollow pin 9', a tapered female internal surface at the inner end of the sleeve 22 cooperates with a correspondingly tapered male outer surface at the exposed end of the hollow split pin 9' for clamping the pin end to the stem with the bearing surface 15a on the stem firmly held in the clearance 13 in the pin.

The support plate illustrated in the drawings has two parallel rows of pins 8-8', 9-9', regularly spaced apart. A corresponding member of plates 20-20' is associated with the pins and their connecting parts 21-21' constitute two parallel lines permitting easy shunting of the corresponding conductors. The pins and associated plates may obviously be distributed geometrically in any desired manner.

I claim:

1. A device for connecting electrical conductors comprising an insulating support having a socket extending therethrough from face-to-face thereof and a recess opening to said socket; a unitary conductor pin fixed in said socket and including two end parts and an intervening connecting portion, each of said end parts being hollow for the reception of the free end of a conducting stem; a conducting member in said recess and being in contact with said conductor pin; and a cooperating connector unit cooperable with said conductor pin, said connector unit comprising said conducting stem; a first sleeve slidable on said stem and having an inner end engageable with one of said pin end parts, and an outer end; a second sleeve slidable on said stem and relatively to said first sleeve; a spring interposed between said stem and the outer end of said first sleeve and urging the latter axially of said

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stem toward the free end thereof; means on said sleeves engageable with each other for limiting movement of said first sleeve relative to said second sleeve toward the free end of said stem; and means on said stem and said second sleeve engageable with each other for limiting movement of said second sleeve relative to said stem toward the free end thereof.

2. A device according to claim 1 in which said insulating support is formed with a plurality of sockets and associated recesses in each of which are respectively mounted a conductor pin and conducting member as specified in claim 1, and in which each of a plurality of such conducting members has an end portion projecting outwardly of said insulating support for being electrically connectable to the projecting end portion of at least one other of said conducting members.

3. A device according to claim 1 in which said pin is split longitudinally and is formed internally with a recessed clearance, and in which said conducting stem has an outer bearing surface received in said recessed clearance.

4. A device according to claim 3 in which said first sleeve inner end has a tapered female inner surface cooperable with a correspondingly tapered male outer surface at the exposed end of said pin for clamping the pin end to the stem with said outer bearing surface on said stem firmly held in the recessed clearance in the pin.

5. A device according to claim 1 in which said means on said sleeves engageable with each other comprises an external flange at the outer end of said first sleeve, and an intumed flange on the inner end of said second sleeve, and in which said means on said stem and said second sleeve engageable with each other comprises an external flange on said stem and an intumed flange on the outer end of said second sleeve.

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