

Dec. 3, 1963

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3,112,973

LOCKING THREE-WIRE ELECTRICAL CORD CONNECTOR

Filed Sept. 26, 1960

2 Sheets-Sheet 1

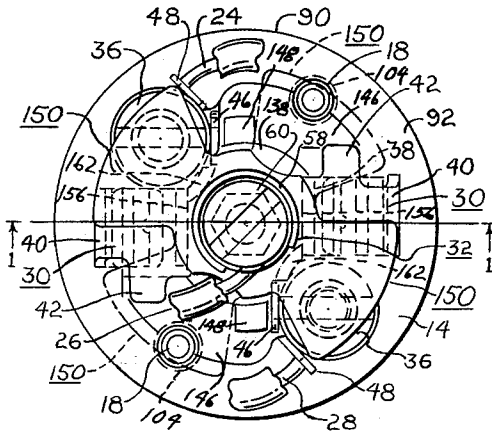


Fig. 2.

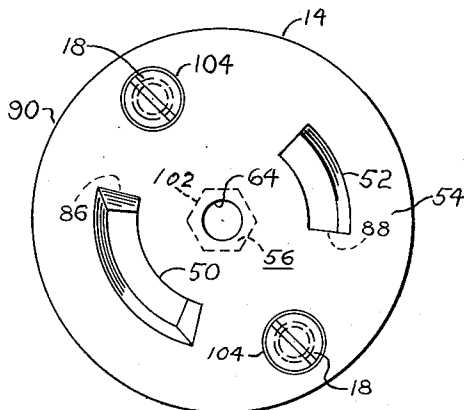


Fig. 3.

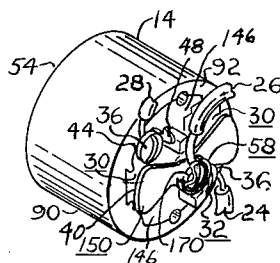


Fig. 4.

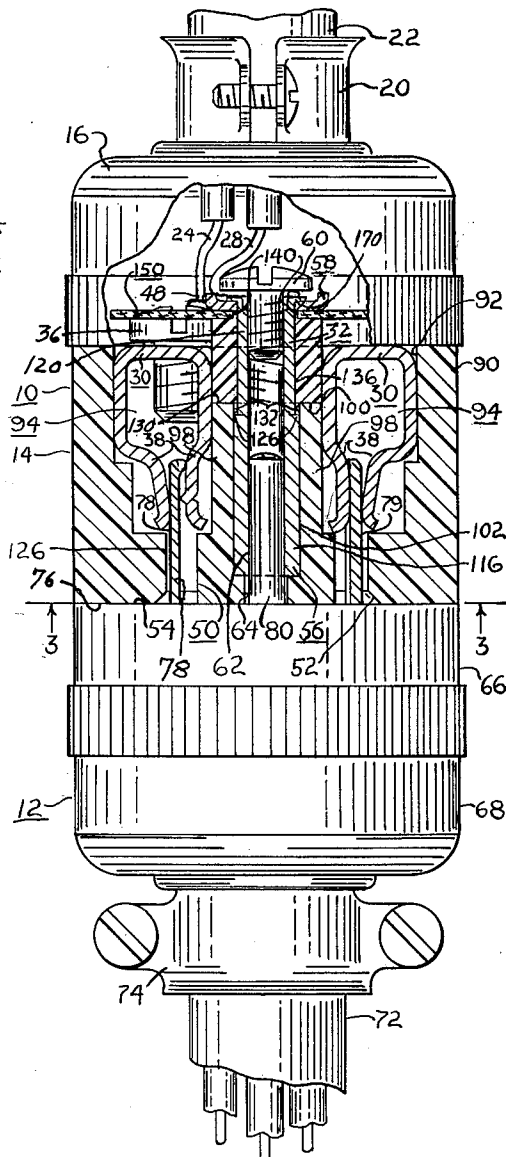


Fig. 1.

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2 Sheets-Sheet 2

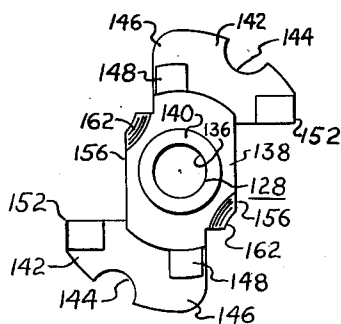


Fig. 6.

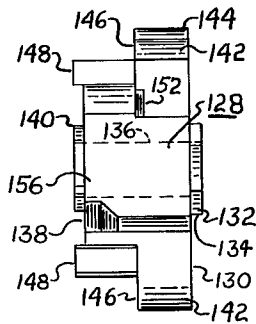


Fig. 7.

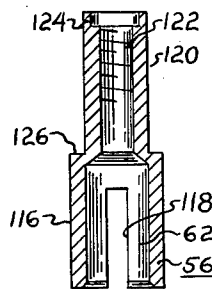


Fig. 8.

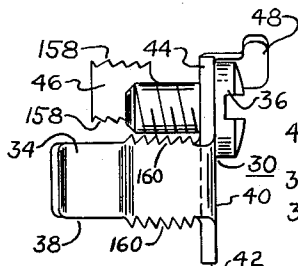


Fig. 10.

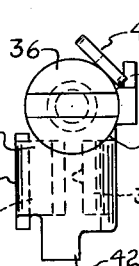


Fig. 11.

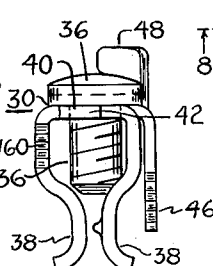


Fig. 12.

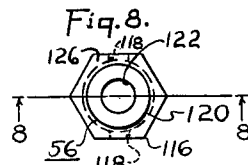


Fig. 9.

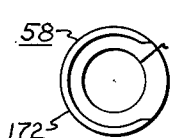


Fig. 13.

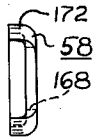


Fig. 14.

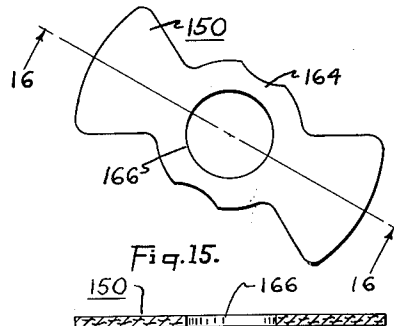


Fig. 15.

Fig. 16.

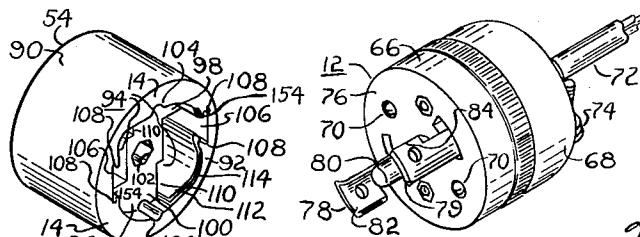


Fig. 5.

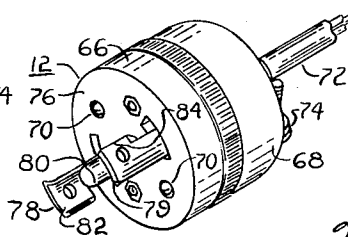


Fig. 17.

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3,112,973 LOCKING THREE-WIRE ELECTRICAL CORD CONNECTOR

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Filed Sept. 26, 1960, Ser. No. 58,403
12 Claims. (Cl. 339-14)

This invention relates generally to electrical wiring devices, and particularly to an improved, locking, three-wire electrical cord connector.

It is an object of the invention to provide an improved, locking, three-wire electrical cord connector which is readily manufactured and effective, reliable, safe and long-lived in operation.

The object of the invention is achieved in one form by providing an improved, locking, three-wire electrical cord connector having a novelly constructed connector body with improved contact-terminal means, which lends itself to efficient manufacture and which is effective, reliable, safe and long-lived in operation.

The above, other objects and further details of that which I believe to be novel and my invention will be clear from the following description and claims taken with the accompanying drawings wherein:

FIG. 1 is a side elevational view of a locking, three-wire, electrical cord connector embodying my invention, with the connector body and connector cap illustrated in connected relation and with portions of the connector body broken away and shown in section;

FIG. 2 is a plan view of the connector body with the cover section thereof removed to show some of the internal construction thereof;

FIG. 3 is a plan view of the connector body showing the front wall thereof, taken substantially on the line 3-3 of FIG. 1;

FIG. 4 is a perspective view of the FIG. 2 structure;

FIG. 5 is a perspective view of the body section of the connector body;

FIG. 6 is a plan view of one of the connector body elements, namely, the barrier;

FIG. 7 is a side elevational view thereof;

FIG. 8 is a sectional view of another of the connector body elements, namely, the contact sleeves, taken on line 8-8 of FIG. 9;

FIG. 9 is an end elevational view thereof;

FIG. 10 is a side elevational view of some other of the connector body elements, namely, the contact-terminal assembly;

FIG. 11 is a plan view thereof;

FIG. 12 is an end elevational view thereof;

FIG. 13 is a plan view of another connector body element, namely, the cupped contact washer;

FIG. 14 is a side elevational view thereof;

FIG. 15 is a plan view of another connector body element, namely, the insulator;

FIG. 16 is a sectional view taken substantially on line 16-16 of FIG. 15, and

FIG. 17 is a perspective view of the connector cap.

My invention is illustrated in the drawings as being embodied in a midget, locking, three-wire electrical cord connector, and it is extremely useful in such a wiring device; however, if desired, it can be incorporated into other types of electrical wiring devices, such as stationary receptacles, current taps and the like. In the illustrated embodiment, the cord connector comprises a connector body 10 and a selectively connectible and disconnectible connector cap 12, and these connector components are illustrated in FIG. 1 in their connected relation. Various views of the connector body 10 per se are illustrated in

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FIGS. 2-4. Various elements of the connector body 10 that are assembled to form the connector body are illustrated in disassembled condition in FIGS. 5-16. The connector cap 12 per se is illustrated in FIG. 17.

The connector body 10 and the connector cap 12 are of the interlocking type, wherein connection is effected by moving them longitudinally toward each other and then, after the electrical contacts thereof have engaged, turning them relative to each other; disconnection is effected by the reverse operation.

The connector body 10 comprises a body section 14 and a cover section 16 which are assembled by screws 18 that pass through appropriate passageways in the body section 14 and are threadedly anchored into cover section 16, as by being received in threaded openings in inserts (not shown) that are embedded in the cover section. When the sections 14 and 16 are assembled, they form a unitary, generally cylindrical, connector body. Sections 14 and 16 are made of a dielectric material, such as any suitable plastic material having the necessary electrical insulation properties for an electrical wiring device of the type involved.

The cover section 16 supports an adjustable cord clamp 20, of known construction and operation, for a three-wire electrical cord 22. The cord 22 extends through the cord clamp into and through the cover section 16, and the free ends of its three individual wires are disposed within the connector body section 14, bared, and individually connected to contact-terminal assemblies that are disposed within the connector body. These bared wire ends can best be seen in FIGS. 1, 2 and 4 and are designated by reference numerals 24, 26 and 28. Wire ends 24 and 28 are individually connected to the electrical terminal portions of contact-terminal assemblies 30, which are diametrically spaced in the connector body and form a part of the two main current-carrying wire lines. The wire end 26 is connected to the terminal portion of the contact-terminal assembly 32, which is radially centrally disposed in the connector body which comprises the "third" wire that usually is grounded.

Each contact-terminal assembly 30 is substantially identical and can best be seen in FIGS. 10-12. Each assembly 30 comprises a bent plate member 34 and a binding screw 36. The bent plate member 34 includes a pair of curved spring legs 38 which cooperate to form a U-shaped, female electrical contact which are connected by a flat wall 40. One end of flat wall 40 has a projecting tab 42 formed thereon and the other end is formed into a binding plate portion 44 and includes a threaded opening for receiving the shank of the binding screw 36. Adjacent the binding plate portion 44 there are formed a mounting leg 46 that extends from the flat wall 40 in the same direction as the legs 38 and an L-shaped leg 48 that extends in a direction opposite to that of the mounting leg 46 and functions as a strain relieving ear for a lead wire end that is connected between the binding plate portion 44 and the binding screw 36. By reference to FIG. 2, it will be observed that each of the wire ends 24 and 28 is individually clamped between a binding plate portion 44 and a binding screw 36 head by being wrapped around the shank of the binding screw, and a strain relief is effected by individually directing the bared portions of the separated lead wires under their associated, L-shaped, strain-relief ear 48 and wrapping them around said ear.

The contact-terminal assemblies 30 are physically mounted in body section 14, in a manner to be more fully described subsequently, so as to have their U-shaped, female contacts disposed to receive the locking, male, electrical contact blades of the connector cap 12, illustrated in FIG. 17, which are inserted through appropriate, spaced, arcuate slots 50, 52 that are formed in the

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flat front wall 54 of the body section 14 to be in registry with the female contacts of the assemblies 30 when the latter are mounted in the body section.

Contact-terminal assembly 32, which is mounted in the body section 14 to be radially centrally disposed therein, comprises a pin-receiving, contact sleeve 56, illustrated by itself in FIGS. 8 and 9, a cupped terminal washer 58, illustrated by itself in FIGS. 13 and 14, and a binding screw 60. The details of construction and assembly of contact-terminal assembly 32 will be described subsequently; however, for the present it should be understood that the binding screw 60 and the cupped terminal washer 58 cooperate to form a terminal for clamping the third wire end 26, and that the sleeve 56 includes a generally cylindrical passage 62 that is positioned when the sleeve 56 is disposed in the body section 14, so as to be in registry with a central opening 64 formed in the front wall 54.

Although all of the details of construction, assembly and operation of the individual elements of the connector body 10 have not yet been described in detail, it will be apparent from the foregoing that the connector body 10 essentially comprises one component of a two component, electrical cord connector, which is constructed and arranged to have the individual wires of a three-wire electrical cord individually connected to the terminal portions of three contact-terminal assemblies that are mounted in the connector body, these assemblies also having portions forming female contacts that are positioned to be in registry with openings in the front wall of the connector body, whereby male, electrical contact members of a connector cap, which is the other component of the cord connector, may be inserted into and through the openings into engagement with the female contacts.

The connector cap 12 is illustrated in FIGS. 1 and 17, and includes a body section 66 and a cover section 68 that are secured to each other by the securing screws 79 to form a unitary, generally cylindrical member. Cap sections 66 and 68 are made of a dielectric material. Connector cap 12 includes contact-terminal means having electrical terminals disposed internally thereof for receiving the three bared ends of the individual wires of a three-wire electrical cord 72 that extends into the connector cap by passing through an opening in the cover section 68. The cord 72 is clamped by cord clamp 74 of known construction which is supported by the cover section 68. Some of the referred-to, structural details of the connector cap 12 have not been specifically illustrated, because the particular construction of the connector cap 12 forms no specific part of my invention. However, it should be realized that the contact-terminal means of the connector cap 12 includes three electrical terminals which are individually electrically connected to three male electrical contact members that project from the front wall 76 of the cap. Each associated electrical terminal means and male electrical contact member may conveniently form a part of an individual contact-terminal assembly.

Two of the male electrical contact members are in the form of male electrical contact blades and are designated by reference numerals 78 and 79. Male electrical contact blades 78 and 79 are of the known interlocking type, and are diametrically disposed and project from the connector cap front wall 76. The third male electrical contact member comprises a radially centrally disposed, male electrical contact pin 80 which projects from the front wall 76. The two electrical terminals disposed on the interior of the connector cap 12 which are individually operationally associated with the male contact blades 78 and 79 are individually connected to two of the three wires of the cord 72 which are the two main line wires. The electrical terminal disposed on the interior of the connector cap 12 which is operationally associated with the male electrical contact pin 80 is connected to the third wire of the cord 72.

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As generally pointed out above, the connector cap 12 is constructed so as to be selectively lockingly connected to and disconnected from the connector body 10. To effect such operation, the contact elements on the connector body and connector cap are so configured and dimensioned as to cooperate to permit such operation. In this regard it will be observed that one of the male electrical contact blades (78) is wider than the other contact blade (79), and one of the slots (50) in the connector body front wall 54 is correspondingly wider than the other slot (52). It will be understood by those skilled in the art that the purpose of this dimensional relationship is to maintain proper polarization of the electrical elements. It should be apparent from the foregoing that to effect connection of the connector body and connector cap, these connector components are juxtaposed so as to be substantially coaxial with the male contact pin 80 adjacent the opening 64, the male contact blade 78 adjacent the opening 50, and the male contact blade 79 adjacent the opening 52. When so disposed, the connector components are moved axially toward each other, the male contact members 78, 79 and 80 pass through the openings 50, 52 and 64, respectively, and are received in the female contacts formed by assemblies 30 and 32 when the latter are disposed in the connector body 10.

With reference to FIG. 1, it will be observed that the male contact blade 78 is received in the U-shaped female contact formed by one of the contact-terminal assemblies 30, the male contact pin 80 is received in the female contact formed by cylindrical passage 62 in the contact-terminal assembly 32, and the other male contact blade 79 is received in the U-shaped female contact formed by the other contact-terminal assembly 30. After electrical contact has been made between the male and female contact members, the connector components are turned relatively to each other to effect interlocking of these components. Such interlocking is effected in a known manner by the cooperative action of lateral lugs 82 and 84 formed on male contact blades 78 and 79, respectively, which cooperate with internal wall portions 86 and 88 (see FIG. 3) appropriately formed adjacent ends of the slots 50, 52, respectively, and parallel to and spaced from the front wall 54 of the body section 14.

Interlocking three-wire electrical cord connectors of the foregoing general type are known in the art. My invention is particularly concerned with eliminating a number of specific, serious problems in such cord connectors which existed prior to my invention. For example, prior art electrical cord connectors of the type involved were subjected to operational breakdown as a result of shorting of either of the line (side) terminals with the third wire (central) terminal in the connector body, or as a result of a failure in the mechanical connection between the line wire ends and the line terminals in the connector body. These two causes of breakdown were particularly likely in three-wire electrical cord connectors of the mid-gut type, wherein the elements and element spacing are extremely small. Furthermore, some prior art connector bodies include a rather large entrance opening in their front wall which is in registry with their central female contact for receiving the male contact pin of the connector cap. This large opening constitutes a safety hazard, because small metallic foreign objects might be inserted through the large central opening and moved into contact with the central female contact. If the cord connector were being utilized to carry electrical currents at a voltage in the order of 250 volts, as cord connectors of the type involved frequently do, there is danger of electrical shock.

In order to eliminate the foregoing problems existing in prior art devices and concomitantly provide a readily and efficiently manufactured connector body, I have devised a novel connector body construction.

My novel connector body, as pointed out above, essentially comprises the body section 14 and cover section 16

which are secured to each other and, inter alia, internally support the referred-to, contact-terminal assemblies 30 and 32. In prior art cord connectors of the type alluded to in the preceding paragraphs, the connector body also essentially comprised an assembled body section and a cover section; however, the prior art contact-terminal assemblies were mounted in an integral body section which positioned them rather close to each other and created the shorting problem. Furthermore, the prior art "wrap around" lead wire terminal connectors were prone to disconnect as a result of strain on the wires. Also, the prior art central contact-terminal assembly was so constructed and mounted that a fairly large opening was formed in the front wall of the connector body and a portion of the central female contact for receiving the male contact pin of the connector cap was exposed, thereby creating a safety problem. My invention contemplates mounting the contact-terminal assemblies 30 and 32 in body section 14, which is of novel internal configuration, and utilizing a cooperating novel barrier in such a manner that the enumerated problems are significantly minimized.

As can best be seen in FIG. 5, the body section 14 comprises a uniquely internally compartmented member that may be conveniently molded of an appropriate plastic material. The body section 14 includes a plurality of recesses, openings, passages, slots, shoulders, grooves and other formations which will be subsequently described in detail. However, in order to facilitate a rapid, general understanding of its construction, the major facets of its configuration will be initially described. As previously pointed out, the body section 14 includes a flat front wall 54. The body section 14 also includes a cylindrical side wall 90, and another flat wall 92 which is parallel to and spaced from the front wall 54. The previously referred-to slots 50 and 52, which extend through the front wall 54, communicate with deep recesses 94 which extend completely through the flat wall 92. The recesses 94 are similar, irregularly shaped as illustrated, and communicate with a shallow recess 96 formed in the wall 92. The recesses 94 and 96 cooperate to form a diametrically extending, central wall formation 98 which is irregular in outline and extends from the front wall 54 to its flat wall 100 that is spaced inwardly of and generally parallel to the wall 92. Centrally of the wall formation 98 and extending axially therethrough from the wall 100 to a point short of the front wall 54 is an elongated passage 102. Passage 102 has an hexagonal cross section and is coaxial and communicates with the opening 64 in the front wall, the latter, however, being circular in cross-section and smaller than the cross-sectional extent of passage 102. On the diametrically opposite sides of the body section 14 there are formed a pair of spaced, plain, cylindrical bores 104 that extend completely through the front wall 54 at one of their ends, where they are enlarged adjacent thereto to receive the heads of securing screws 18 (see FIG. 3), and which at their other ends extend completely through wall formation 98 and have half-round portions thereof extending through the flat wall 92.

Each recess 94 is formed by a complex of surfaces and includes a flat wall portion 106 that communicates with a pair of laterally spaced, axially extending grooves 108 to form a pocket for receiving a mounting portion of a contact-terminal assembly 30 when the latter is operatively disposed in body section 14 by being mounted in the recess. Each recess 94 also includes a notch 110 for receiving another mounting portion of a contact-terminal assembly 30. Each recess 94 further includes an arcuate notch 112 which forms a clearance space for the shank of a binding screw when a contact-terminal assembly 30 is mounted in the recess. Adjacent each arcuate notch 112 an arcuate portion of the flat wall 92 is cut away and thereby forms an arcuate shoulder 114.

When the connector body 10 is assembled, the contact sleeve 56 is disposed in the body section 14 with its hexagonal

onal portion 116 inserted fully into the hexagonal passage 102 as far as it can go. The hexagonal portion 116 is diametrically slotted at 118 and the open end of its cylindrical passage 62 is disposed adjacent to and in registry with the opening 64 in front wall 54 of the body section 14, thereby forming a somewhat flexible, radially expandible, female contact. The remainder 120 of the sleeve 56 is cylindrical, internally threaded at 122, and has its wall thickness reduced at its free end 124. When the sleeve 56 is operatively disposed in the passage 102, the radial shoulder 126 between its hexagonal portion 116 and its cylindrical portion 120 is spaced slightly below the wall 100 of the wall formation 98. In assembling the connector body, in practice, the sleeve 56 may simply be slid into the passage 102, with its hexagonal portion 116 first.

A uniquely shaped barrier 128 made of a suitable dielectric plastic material, such as nylon, is disposed in the body section 14 and mounted on the cylindrical portion 120 of the sleeve 56. When viewing the barrier 128 from the top, as illustrated in FIG. 6, it has a general plan outline which is substantially the same as that of the wall 100. Its bottom wall 130 (see FIG. 7) is flat except for a central collar 132 which depends from the wall 130 and has an hexagonal outer surface 134. When barrier 128 is operatively mounted, its bottom wall 130 rests on the wall 100 of the body section, and its collar 132 extends into passage 102 and contacts shoulder 126 of sleeve 56. A cylindrical passage 136 extends completely through the barrier 128 from the top wall 138 through the bottom wall 130 and collar 132, thereby permitting the barrier 128 to be slid onto the cylindrical portion 120 of the sleeve 56 which projects out of passage 102 and above the wall 100. A cylindrical collar 140 is formed on the top wall 138 and surrounds the passage 136.

The barrier 128 includes a pair of oppositely extending wing portions 142 having a thickness which is approximately one-half the thickness of the central portion of the barrier, i.e., the distance between the bottom wall 130 and top wall 138. Each wing 142 has a half-round notch 144 formed therein which cooperate with the half-round portions of bores 104 in the body section 14 that extend through wall 92 when the barrier is mounted thereon to complete the passageways in the body section for the screws 18. The wings 142 are configured so as to complement portions of recess 96 in the body section 14, and are comfortably received therein when the barrier is mounted on the body section. The thickness of the wings 142 is substantially the same as the depth of the recess 96, and therefore, the flat upper surfaces 146 of the wings are coplanar with the flat wall 92 when the barrier is mounted in the body section 14. The general plan outline of the barrier 128 coincides with the general outline of the wall 100, and the side walls of the barrier cooperate with the body section 14 to, in part, form cavities 94, when the barrier is mounted on the body section. Also, the central portion of the barrier 128 projects above the flat wall 100 when the barrier is mounted in the body section.

At opposite sides of the barrier 128 a pair of upstanding lugs 148 is formed which extend above the barrier top wall 138 to about the same extent as the collar 140 projects. Lugs 148 function as stops for a thin, generally hourglass-shaped insulator 150, which may be made of a vulcanized fibre material and is illustrated by itself in FIGS. 15 and 16. The insulator 150 is mounted on barrier collar 140 and is selectively adjustable to cover the side terminals in the connector body after they have been wired, as will become apparent subsequently. Each wing 142 also includes a lateral shallow notch 152, which notches cooperate with diametrically spaced, narrow, shallow notches 154 (see FIG. 5) that are formed in the flat wall 92 of the body section 14 adjacent the recesses 96 to form pockets for tabs 42 when the assemblies 30 are mounted.

When the sleeve 56 and barrier 128 have been mounted on the body section 14, the flat, parallel, spaced, side walls 156 of the barrier 128 cooperate with the recesses 94 to define cavities for receiving contact-terminal assemblies 30. The contact-terminal assemblies 30 include means for securely mounting themselves in the body section 14, and means which as an incident thereto retains the sleeve 56 and barrier 128 in assembled position. The mounting means comprises saw-toothed edge portions 158 formed on the mounting legs 46 and saw-toothed edge portions 160 formed on one of the spring legs 38. To effectuate mounting, after the sleeve 56 and barrier 128 have been mounted in the body section 14, the contact-terminal members 34 are inserted into the cavities formed by the recesses 94 and the side walls 156 of the barrier 128. Each member 34 is mounted by having its spring leg 38 which includes saw-toothed edge portions 160 forced into a pocket formed by a flat wall portion 106 and its associated grooves 108, while simultaneously forcing its mounting leg 46 into a notch 110. When each member 34 is fully mounted, it cannot be removed without destroying some of the parts, because the saw-toothed edge portions of the members 34 bite into the material of which the body section 14 is made and prevent withdrawal of the members 34. When fully mounted the tabs 42 of the members 34 are disposed in the pockets formed partially by the barrier notches 152 and the body section notches 154, thereby locking the barrier 128, and in turn the sleeve 56, in mounted position on the body section. When the members 34 are fully mounted, the outer surfaces of their flat walls 40 are generally coplanar with the body section wall 92, and their binding plate portions 44 rest on the shoulders 114. Binding screws 36 are threadably received in threaded openings in the binding plate portions 44 and, as previously mentioned, the shanks thereof are permitted clearance for movement by the arcuate notches 112. In order to freely accommodate the heads of the binding screws 36, the central portion of barrier 128 is relieved at spaced, side, upper points 162.

The insulator 150 (see FIGS. 15 and 16) includes a central mounting portion 164 having a circular central opening 166 that is disposed about the barrier collar 140 so as to be partially rotatable thereon between the limits afforded by the lugs 148. As can best be seen in FIG. 2, the insulator 150 is capable of being moved to two principal positions, the solid line position wherein its ends cover and insulate binding screw 36 heads from above, and the dotted line position wherein the binding screws are made accessible to permit wiring changes. In this condition of assembly, cylindrical portion 120 of the sleeve 56 extends completely through the passage 136 in the barrier 128 slightly above the flat barrier wall 138 and collar 140. The cup-shaped washer 58, which is shown by itself in FIGS. 13 and 14, is disposed on top of the insulator 150 with its central opening 168 disposed about the portion 124 of the sleeve 56, and portion 124 is deformed, as by spinning over, at 170 (see FIG. 4) to assemble sleeve 56, barrier 128, insulator 150 and washer 58 to each other, as an integral subassembly. Although the assembly description has proceeded with the step of mounting the assemblies 30 prior to mounting the insulator 150 and washer 58, it should be understood that the assemblies 30 could be mounted after the subassembly of the sleeve, barrier, insulator and washer is completed. The cup-shaped washer 58 has an upstanding peripheral wall portion 172 that extends around a major portion of the periphery of the washer. The binding screw 60 has its threaded shank received in the threaded portion 122 of the sleeve 56, and cooperates with the sleeve mounted washer to form a terminal for the third wire.

The foregoing comprises a rather detailed exposition of the construction and assembly of the various elements of the connector body 10. In wiring the connector body, the line wire ends 24 and 28 are individually clamped to

the terminals formed by the binding screws 36 and the binding plate portions 44 of assemblies 30 by being wrapped around the shanks of screws between the screw heads and the portions 44 and then being directed and wrapped around the strain-relieving ears 48, and the third wire end 26 is wrapped around the shank of the binding screw 60 and clamped between its head and the washer 58. The overall connector body construction and arrangement is such that shorting between the terminals that form a part of the assemblies 30 and the terminal which forms a part of the assembly 32 is reduced to a minimum, largely because of the enhanced insulating effect of the barrier 128 relative to prior art arrangements. These terminals are not only radially spaced apart, as can best be seen in FIG. 2, but they are also axially spaced apart, to the extent that the terminal of assembly 32 is axially spaced from the terminals of the assemblies 30. It has been found in practice that internal shorting is minimized by the new arrangement, resulting in a significant reduction in rejected devices in production. The new arrangement has the additional benefit of eliminating wire and terminal connection mechanical failures at the terminals of the assemblies 32. This results in large measure from the effective, strain-relieving function performed by the ears 48. The new arrangement has the further advantage of minimizing the likelihood of shock which would result from the unauthorized insertion of a metallic foreign object into the opening 64 in the front wall 54 of the connector body section 14. This results from the improved mounting sleeve 56 construction and arrangement, which is mounted wholly within the body section 14 with only a minimal amount exposed to the exterior through the opening 64, as contrasted with prior art connector bodies wherein corresponding sleeves are mounted from without the body section 14 and have substantial portions accessible from the exterior which are readily contacted by foreign objects.

Notwithstanding the fact that my improved connector body is superior to prior art connector bodies in that it has eliminated the referred-to problems heretofore existent, it is readily manufactured. In the latter regard, it should be noted that the subassembly of sleeve 56, barrier 128, insulator 150 and washer 58 is readily assembled and may be mounted as an assembled unit on the body section 14, and that the entire subassembly is retained in assembled condition by the contact-terminal assemblies 30, after the latter have been permanently mounted in their cavities in the body section 14.

The overall cooperative effect of the novel constructed connector body is such as to satisfy the object of this invention by providing an effective, reliable, safe, durable device. In providing this novel, improved construction which eliminates a number of previously existing problems, applicant has devised a device which can be manufactured readily and efficiently.

As will be evident from the foregoing description, certain aspects of my invention are not limited to the particular details of construction of the examples illustrated, and I contemplate that various and other modifications and applications will occur to those skilled in the art. It is, therefore, my intention that the appended claims shall cover such modifications and application as do not depart from the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A multi-wire electrical cord connector comprising: a connector body including a body section made of electrical insulating material and a cover section made of electrical insulating material adapted to be secured to each other; said body section having a plurality of spaced cavities formed therein; a barrier made of electrical insulating material being separate from and mounted on said body section, cooperating therewith to in part form said cavities and having an enlarged central portion disposed partially between said cavities and partially extending

beyond said body section; said barrier being separate from said cover section and carried independently thereof by said body section; and a plurality of electrical contact-terminal assemblies secured to said body section in said cavities; the terminals of said assemblies being disposed so as to be spaced apart and separated by said barrier central portion.

2. A cord connector as defined in claim 1 wherein said body section includes a recess for removably receiving a portion of said barrier; and said assemblies include means for irremovably retaining said barrier on said body section which becomes operative on mounting said assemblies on said body section after said barrier has been disposed in said recess.

3. A cord connector as defined in claim 2 wherein said retaining means of each of said assemblies comprises a tab that overlies a portion of said barrier at a location such that said tab interferes with it so as to prevent its removal from said body section unless said assemblies are removed first.

4. A cord connector as defined in claim 1 wherein said assemblies include means for irremovably mounting themselves on said body section in the form of saw-toothed edges that become embedded in the material that the body section is made of when said assemblies are mounted.

5. A cord connector as defined in claim 1 wherein said assemblies include strain-relieving ears that are arranged to have electrical lead wire ends that are clamped to the terminals of said assemblies wrapped around them.

6. A multi-wire electrical cord connector comprising: a connector body including a body section made of electrical insulating material; said body section having a plurality of spaced cavities formed therein; a barrier made of electrical insulating material being separate from and mounted on said body section, cooperating therewith to in part form said cavities and having an enlarged central portion disposed partially between said cavities and partially extending beyond said body section; a central passage formed through said body section and said barrier which extends from the interior of said connector body to a point short of the front wall of said body section; an opening formed in said front wall of reduced cross sectional area relative to and in registry with said passage; a plurality of electrical contact-terminal assemblies mounted on said body section in said cavities; the terminals of said assemblies being disposed so as to be spaced apart and separated by said carrier central portion; and a contact-terminal assembly disposed in said passage with a contact in position to engage a contact that is inserted through said opening and a terminal disposed adjacent said barrier central portion where it extends beyond said body section whereby said last named terminal is spaced from the assembly terminals in two planes.

7. A cord connector as defined in claim 6 wherein the contact of the assembly disposed in said passage is of a size and configuration as to be mountable solely from within said body section, whereby a minimum amount of said contact is accessible from the exterior of said connector body through said opening.

8. A cord connector as defined in claim 6 wherein said contact-terminal assembly disposed in said passage comprises a sleeve having a bore formed in its end adjacent to said opening which forms said contact, and its other end extends out of said passage through said barrier and supports said terminal.

9. A cord connector as defined in claim 8 wherein said other end of said sleeve centrally supports a thin elongated insulator for limited rotation between two principal positions, one wherein the ends of said insulator overlie the terminals of said electrical contact-terminal assemblies that are mounted in said cavities.

10. A cord connector as defined in claim 9 wherein said barrier, said sleeve, said terminal and said insulator are formed as a unitary subassembly that may be handled as a unit during assembly of the cord connector.

11. A multi-wire electrical cord connector comprising: a connector body including a body section made of electrical insulating material and a cover section made of electrical insulating material adapted to be secured to each other; said body section having a plurality of spaced cavities and a recess formed therein; a barrier made of electrical insulating material being separate from and mounted on said body section in said recess and cooperating with said body section to in part form said cavities; said barrier having an enlarged central portion disposed partially between said cavities and partially extending beyond said body section; said barrier being separate from said cover section and carried independently thereof by said body section; and a plurality of electrical contact-terminal assemblies mounted on said body section in said cavities; the terminals of said assemblies being disposed so as to be spaced apart and separated by said barrier central portion; said assemblies having means for irremovably mounting themselves on said body section in the form of saw-toothed edges that become embedded in the material that the body section is made of when said assemblies are mounted; and said assemblies including means for irremovably retaining said barrier on said body section which becomes operative on mounting said assemblies on said body section after said barrier has been disposed in said recess which includes a tab that overlies a portion of said barrier at a location such that the tab interferes with the barrier so as to prevent the removal of said barrier from said body section unless said assemblies are removed first.

12. A multi-wire electrical cord connector comprising: a connector body including a body section made of electrical insulating material; said body section having a plurality of spaced cavities formed therein; a barrier made of electrical insulating material mounted on said body section, cooperating therewith to form said cavities and having an enlarged central portion disposed partially between said cavities and partially extending beyond said body section; and a plurality of electrical contact-terminal assemblies mounted on said body section in said cavities; the terminals of said assemblies being spaced apart and separated by said barrier central portion; each of said assemblies comprising a bent metallic plate member having means for securing it to said body section, means for retaining said barrier on said body section, a binding plate portion, a strain-relieving ear and a binding screw that is adjustably mounted in said binding plate portion; and a multi-wire electrical cord with an electrical lead wire end of each of the cord wires wrapped individually around one of the shanks of one of said screws and clamped between the head of one of said screws and its associated binding plate portion and wrapped around its associated strain-relieving ear.

References Cited in the file of this patent

UNITED STATES PATENTS

1,238,460	Tregoning	Aug. 28, 1917
1,721,207	Cunningham	July 16, 1929
2,055,329	Benander	Sept. 22, 1936
2,455,930	Hubbell	Dec. 14, 1948
2,610,222	Burt et al.	Sept. 9, 1952
2,920,304	Webster	Jan. 5, 1960
2,927,297	Hubbell	Mar. 1, 1960
2,930,019	Hubbell	Mar. 22, 1960
3,023,394	Hubbell	Feb. 27, 1962