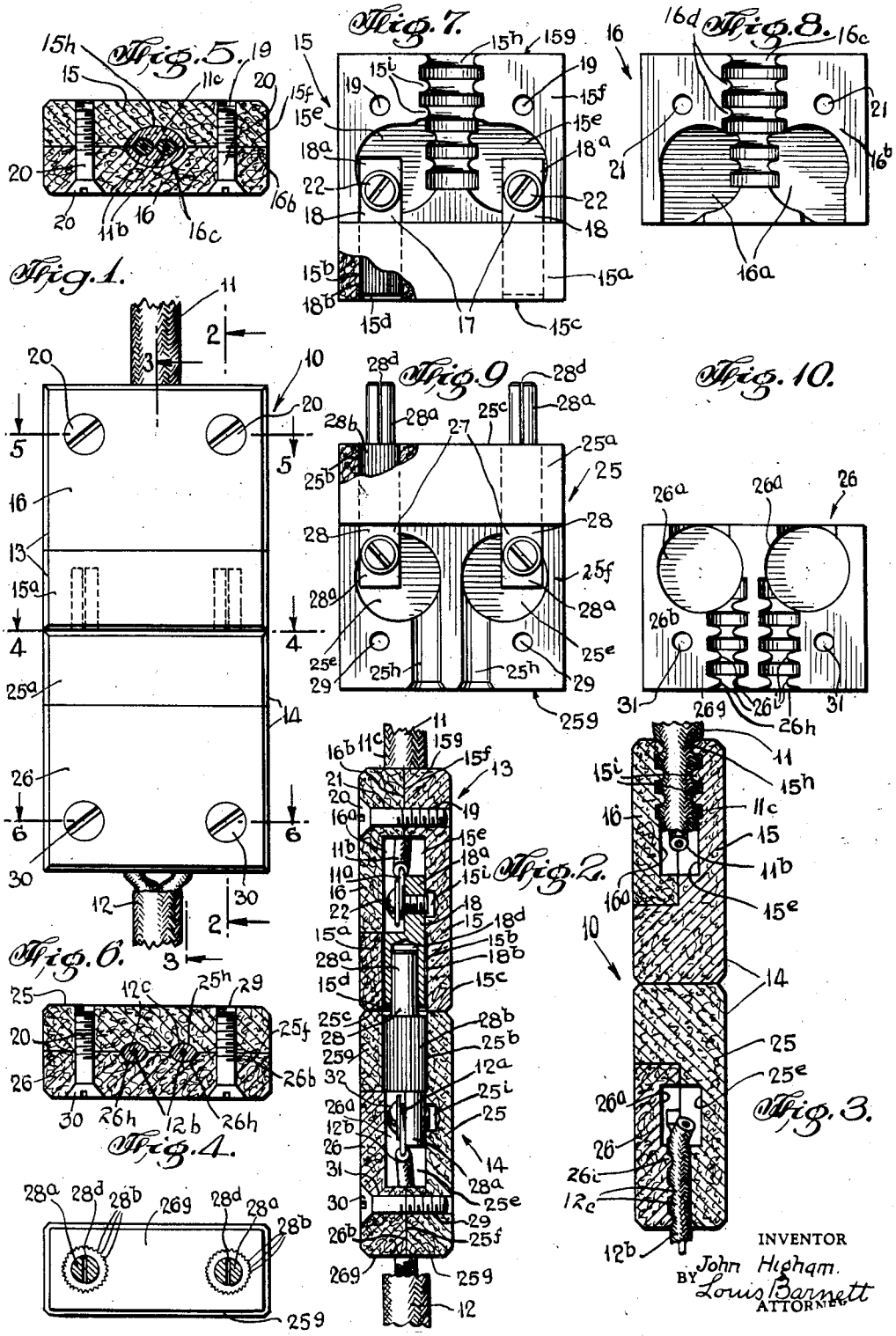
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J. HIGHAM

ELECTRIC CABLE COUPLING CONNECTER

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INVENTOR
John Higham.
BY Louis Barnett
ATTORNEY

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JOHN HIGHAM, OF PORT RICHMOND, NEW YORK, ASSIGNOR TO DISPLAY STAGE LIGHTING CO. INC., A CORPORATION OF NEW YORK.

ELECTRIC-CABLE-COUPLING CONNECTER.

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This invention relates to electrical fittings and more particularly is directed to quick detachable electrical coupling connecters of improved construction for joining portable circuit conductors to stage lighting units, industrial electric appliances and like apparatus.

Among the objects of the invention is to generally improve portable circuit electric connecters of the character described to provide separable coupling structures comprising few and simple parts that are rugged, durable and being capable of withstanding the hardest usage and wear, which shall be readily incorporated in circuit, easy and handy to separate and connect, cheap to manufacture, and practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements and arangement of parts which will be exemplified in the construction hereinafter described and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown various possible illustrative embodiments of this invention—

Fig. 1 is a top plan view of an electric connecter embodying the invention incorporated in a portable circuit, only a fragmentary portion of the circuit cables being shown.

Figs. 2, 3, 4, 5 and 6 are cross-sectional views taken on lines 2—2, 3—3, 4—4, 5—5 and 6—6, respectively in Fig. 1.

Fig. 7 is a top plan view of the female coupling block of the improved connecter with the cover piece removed.

Fig. 8 is a view of the inner side of the cover piece of the female coupling block.

Fig. 9 is a top plan view of the male coupling block of the improved connecter with the cover piece removed, and

Fig. 10 is a view of the inner side of the cover piece of the male coupling block.

Referring in detail to the drawing, 10 denotes a quick detachable electric coupling connecter adapted to be incorporated in a portable circuit for joining stage lighting units, industrial electric appliances and the like apparatus to a suitable power source (not shown). Only fragmentary portions of the power feed cable 11, and the appliance cable 12 are here shown. Preferably the power feed cable 11 joins the female block 13 of the connecter 10 to the power source and the cable 12 joins the connecter male block 14 to the appliance (not shown) in the well understood manner.

The female block 13 comprises a body piece 15, a cover piece 16 demountably attached to the body piece 15 by screws 20, and current carrying parts 17 permanently carried by the body piece 15. The pieces 15 and 16 are machined structures made of insulating material cut from compressed block or sheet fibre in preference to being individually molded. Compressed fibre for this purpose is commercially available at a relatively cheap price and can be readily cut, drilled, threaded and machined to form said pieces 15 and 16. Since the connecter 10 in service is subjected to unusual hard and rough wear and abuse, it has been found that insulating fibre stands up better under the severe service to which it is subjected than individually molded pieces. Fibre is not only tough and resilient but is practically immuned from chipping, fracturing, crumbling or breaking. The machining required to form the improved device 10 as will hereinafter be described, are few and simple so that a practical and efficient device can be produced at less cost than is possible to commercially produce the device of molded pieces capable of withstanding to some fair degree the hard usage to which the device is usually subjected.

The body piece 15 may be of rectangular cross-section and has a part thereof cut away, said part being equivalent in size and shape to the cover piece 16. The latter is made to just fill said cut away part and is substantially half the thickness of the body piece, over half the length thereof and equal thereto in width as is clearly shown in Figs. 1, 2, 7, 8, 9 and 10.

Spaced metallic contact receptacle members 18 of the current carrying parts 17 are positioned to extend lengthwise through uncut portion 15^a of the body piece 15. Said members 18 are snugly fitted into bored holes 15^b which extend in from an end surface 15^c of said piece 15, the sleeve ends 18^b of the members 18 being set into said portion 15^a below the level of the end surface 15^c as at 15^d. The lug or terminal ends 18^a of said members 18 extend into spaced recess 15^e cut below the level of the surface 15^f of the piece 15. Said recesses 15^d communicate with the end sur-

face 15^g opposite the surface 15^c by means of a single channel 15^h having a smoothly ridged wall 15^i as is clearly seen from Fig. 7. Threaded holes 19 are provided on opposite sides of the passage 15^h between the recesses 15^e and the end surface 15^g for engaging with the threaded end of screws 20.

The cover piece 16 has spaced recesses 16^a cut below the level of the surface 16^b thereof, said recesses 16^a being positioned to mate with the recesses 15^e of the piece 15 to form a housing about the terminal end 18^a. A single channel 16^c is cut to extend below the level of the surface 16^b communicating the recesses 16^a with the end surface of the piece 16 corresponding to surface 15^f of the piece 15. Said channel 16^c is formed with a smoothly ridged wall 16^d and mates with the channel 15^h to form a passage for the cable 11. Holes 21 are drilled through the piece 16 in register with said threaded holes 19 wherethrough the screws 20 extend for clamping the piece 15 to 16 together.

The receptacle contact members 18 are preferably driven into position and may be suitably shaped to eliminate possible rotation in the bored holes 15^b. As here shown, said members 18 are of circular cross section and have their outer surface fluted as at 18^b. The terminal lug end 18^a may each carry a suitable binding post, such as the screw 22, for securing a bare end 11^a of the conductor wire 11^b of the feed cable 11. The recesses 15^e may be spotted as at 15^i to provide clearance for the ends of the screw 21 as is shown in Fig. 2.

The female block 13 is fitted to terminate the end of the cable 11 by dismounting the cover piece 16 from the body piece 15 and attaching the conductor wire bared ends 11^a to the terminal lugs 18^a under the head of the screws 22. The cover piece 16 is then replaced with the end of the cable 11 extending through the passage formed by channels 15^h and 16^c. On tightening the clamping screws 20, portions of the insulating casing 11^c of the cable 11 are forced against the ridged walls 15^i and 16^d of said passage and are conformed to its contour thus forming an efficient strain relief for the connection of the cable wires 11^b with the current carrying receptacle member 18. Said passage is proportioned in cross section to securely clamp the cable 11 between the body and cover pieces yet permits the surfaces 15^f and 16^b to come into abutment so as to effect a complete closure about the live current carrying parts of the circuit therebetween.

The setting back of the sleeve ends 18^b of the contact receptacle members 18 from the end surface 15^c at 15^d aids in shielding the live current carrying members of the circuit which connect the mains or other electric power supply source from being short circuited or being accidentally contacted with.

The male block 12 like the female portion 13 is also seen to comprise a body piece 25, a cover piece 26 demountably attached to the body piece, and current carrying part 27 permanently carried by the body piece 25. Said pieces 25 and 26 are made of the same material and may if desired be identical in construction with the pieces 15 and 16 of the female block 13 described above.

As seen from the drawing, the piece 25 is of rectangular cross section of substantially the same construction, shape, length, width and thickness as piece 15. Spaced metallic contact prong members 28 of the current carrying parts 27 are snugly fitted to extend lengthwise through bored holes 25^b in the uncut portion 25^a of the body piece 25. Pin terminals 28^a adapted to be inserted in sockets 18^d of the sleeve ends 18^b of the female block 13 extend from said members 28 outwardly from an end surface 25^c. The lug or terminal ends 28^a of said members 28 extend into spaced recesses 25^e cut below the level of the surface 25^f of the piece 25. Said recesses 25^e communicate with the end surface 25^g opposite the surface 25^c by means of a pair of spaced, smooth walled grooves 25^h as is clearly shown in Fig. 9. Threaded holes 29 are provided on the opposite side of the grooves 25^h between the recesses 25^e and the end surface 25^g for engaging with the threaded ends of the screws 30.

The cover piece 26 which is made to fit the piece 25 like the cover piece 16 fits the piece 15, described above, is provided with recesses 26^a cut below the level of the surface 26^b thereof. Said recesses 26^a mate with the recesses 25^e of the piece 25 to house said terminal ends 28^a. Hole 31 registering with the threaded holes 29 for receiving therein the clamping screws 30 which secure the pieces 25 and 26 together. Each recess 26^a communicates with the end surface 26^g which aligns with the end surface 25^g through a ridged wall 26^i of groove 26^h. The latter mating with grooves 25^h to provide separate passages for each conductor wire 12^b of the cable 12.

The contact prong members 28 extend through bored holes 25^b and have their outer surface fluted as at 28^b to prevent rotatory movement of said members in the holes. The terminal lug ends 28^a of said members each carry a binding screw 32 for securing a bare end 12^a of the conductor wire 12^b of the cable 12. The recesses 25^e may be spotted as at 25^i to provide clearance for the ends of the screw 31, as is shown in Fig. 2.

The male portion 12 is fitted to terminate the end of the cable 11 by removing the cover piece 26 from the body piece 25 and attaching a conductor wire bare ends 11 to each of the terminal lugs 28^a under the head of the screws 32. The cover piece 16 is then replaced with each of conductor wires 12^b extending through one of the passages 25^h. On tighten-

ing the clamping screws 30 with the cable conductor wires 12^b extending through the passages formed by the grooves 25^h and 26^h, portions 12^c of the insulation of the conductor wires 12^b are pressed into the ridged wall passage 26^i of the cover piece 26 and are conformed to its contour, thus forming an efficient strain relief for the connection of the cable wire ends 12^a with the binding screws 32. The grooves 25^h and 26^h are proportioned to form the cross sections of said passages to securely clamp the cable 12 between the body and cover pieces 25 and 26, respectively yet permits the surfaces 25^f and 26^b to come into abutment so as to effect a complete closure about the current carrying parts of the connection of the cable 12 and members 28.

To provide a resilient contacting engagement of the pins 28^a within the sockets 18^d, said pins may be slitted lengthwise as at 28^d to form springy structures as is shown in Figs. 3 and 9.

The form of strain relief means incorporated in the female block 13 is best suited for feed cables having a relatively thick insulating wall 11^c over the conductor wires 11^b, while the strain relief means incorporated in the male portion 14 is desirable where the insulation wall 11^c over the individual conductor wires 11^b is relatively thick. It is to be understood that either of the connecter blocks may be made with either form of strain relief means. In both forms of said means the cable or conductor wires are clamped between insulating pieces having at least half of the passage wall thereof formed with a smooth-ridged surface which serves to non-abrasively anchor the cables to the blocks without injuring the insulation on the cable or conductor wire.

The connecters 10 when assembled and installed in circuits can by merely uncoupling and coupling the blocks 13 and 14 easily and quickly interchange lighting units appliances or apparatus or disconnect them from the circuits with safety.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In connecters for coupling electric insulated wire cables of the character described, a block formed of machined fibrous sheet material comprising a body piece having a cut away portion and a cover piece, said cover piece being substantially equivalent in shape and dimensions to said cut away portion, spaced metallic contact members driven through an uncut portion of the body piece, said pieces having mating recesses bored in surfaces thereof to form a housing about an inner end of each of said members when the cover piece is applied to replace said cut away portion, a binding post carried by each of said inner ends within said housing, screw fastening means threaded into the body piece and through the cover piece for clamping said pieces together, said pieces having a passage cut to extend between them communicating their mated recesses with the exterior of the block, an end portion of the cable extending through said passage, conductor wires of said cable being secured to said binding posts, the walls of said passage formed with a plurality of smoothly cut ridges extending at least partially therethrough, the insulating portions of the cable end being pressed against and conformed to the contour of said ridges to serve as a strain relief, said passage being proportioned in cross section to securely clamp the cable end portion between said pieces yet permit the latter to come into abutment without injuring the cable insulation.

2. In connecters for coupling electric insulated wire cables of the character described, a female block comprising a body piece having a cut away portion and a cover piece, said pieces being formed of machined fibrous insulating sheet material, said cover piece being substantially equivalent in shape and dimensions to said cut away portion, spaced metallic receptacle contact members driven through an uncut portion of the body piece, said pieces having mating recesses bored in surfaces thereof to form a housing about an inner end of each of said members when the cover piece is applied to replace said cut away portion, screw fastening means threaded into the body piece and through the cover piece for clamping said pieces together, a binding post carried by each of said inner ends, said receptacle members having sleeves terminals set back from an end surface of said block to shield said members against accidental short circuit, said body piece having a channel cut therein communicating said recesses with an exterior side of the block, an end portion of the cable extending through the channel, conductor wires of said cable being secured to the binding posts, said channel formed with cut ridges for engaging insulating portions of the cable pressed against and conformed to the contour thereof to serve as a strain relief, said passage being proportioned in cross section to securely clamp the cable end portion between said pieces yet permit the latter to come into abutment without injuring the cable insulation.

3. In connecters for coupling electric insulated wire cables of the character described, a male block comprising a body piece having a cut away portion and a cover piece, said pieces being formed of machined fibrous insulating sheet material, said cover piece being substantially equivalent in shape and dimensions to said cut away portion, spaced metallic prong contact members driven through an uncut portion of the body piece, said pieces having mating recesses bored in surfaces thereof to form housings about inner ends of said members when the cover piece is applied to replace said cut away portion, screw fastening means threaded into the body piece and through the cover piece for clamping said pieces together, a binding post carried by each of said inner ends, said prong members having split pin terminals extending from the block, said pieces having spaced mating grooves cut therein communicating said recesses with an exterior side of the block, conductor wires of said cable extending into said grooves, the ends of said conductor wire portions being secured to the binding posts, the grooved walls of one of said pieces formed with smoothly cut ridges for engaging insulating portions of the conductor wires pressed against and conformed to the contour of the ridges to serve as a strain relief means, said mated channels forming passages proportioned in cross sections to securely clamp the cable conductor wires between said pieces yet permit the latter to come into abutment without injuring the cable insulation.

4. A connecter for coupling electric insulated wire cables of the character described comprising separable male and female blocks formed of machined sheet insulating fibre, said blocks having portions thereof cut away, cover pieces formed of insulating fibre equivalent in shape and dimensions to said cut away portions, spaced metallic contact receptacle members driven through uncut portions of the female block, said receptacle members having sleeve terminals set back from the end surface of the female block, metalic contact prong members spaced to correspond to said receptacle members driven through an uncut portion of the male block, said prong members having split pin terminals extending from the male block adapted to be inserted in said sleeve terminals, said male and female blocks having recesses bored in a cut surface thereof, one recess at the inner end of each of said contact members, said cover pieces having recesses mating with said block recesses to form housings about the inner ends of said contact members when said pieces are applied to replace said cut away portions, each female block portion and its fitted cover piece having a passage formed there-between communicating their mated recesses with an exterior side of the block, a power cable end extending through said passage, each male block portion and its fitted cover having spaced passages formed therebetween communicating their mated recesses with the exterior side of the block, conductor wires from an appliance extending through said male block passages, binding posts carried by the inner ends of each of the contact members, the conductor wires of said cable and appliance being secured to said binding posts, said passages formed with smoothly cut ridged wall surfaces, the insulating portion of the cable and the appliance conductor wires being pressed against and conformed to the contour of the ridged wall surfaces to form a strain relief for each of said blocks, said passages being proportioned in cross section to securely clamp said cable and appliance wires between the block portions and pieces yet permit the latter to come into abutment with the block portions, and screw fastening means threaded into the block portions and extending through said pieces for clamping them in abutment.

In testimony whereof I affix my signature.

JOHN HIGHAM.