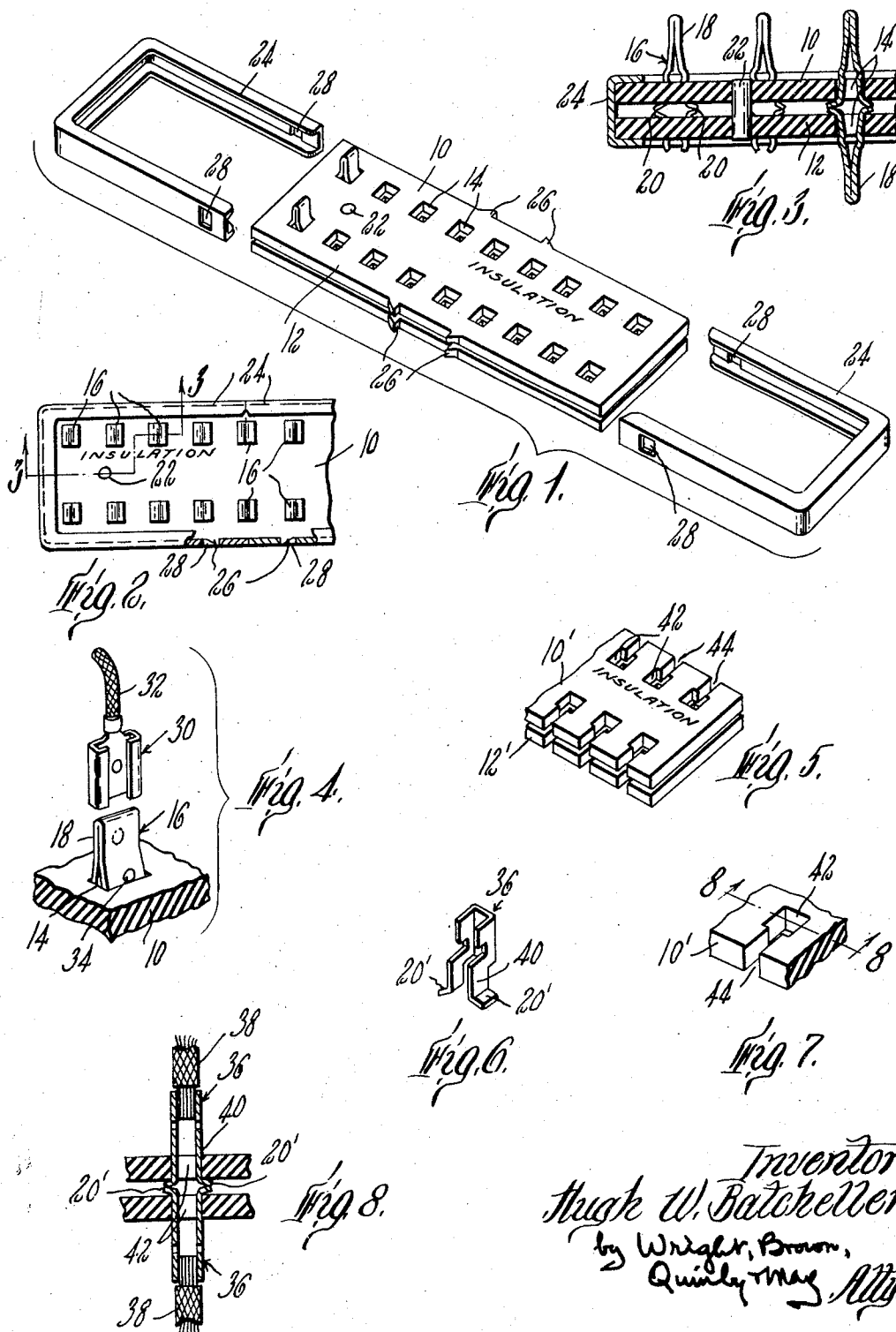


Aug. 9, 1960

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GANG ELECTRIC CONNECTOR

2,948,875

Filed May 31, 1955



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GANG ELECTRIC CONNECTOR

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Filed May 31, 1955, Ser. No. 511,904

4 Claims. (Cl. 339—48)

This invention relates to a gang electric connector for appliances in which a considerable number of wires have to be connected to an equal number of wires in such a way that all the connections can be broken or remade simultaneously at will. One way of achieving this is to attach a small connector member such as a cylindrical plug to each wire of one set, preferably by solder, and to cast a block of thermoplastic insulating material to enclose the joints, leaving the terminals projecting out from the block in an orderly array. An equal number of small sockets each of which is adapted to receive one of the plugs are soldered to the ends of the other set of wires. Thermoplastic insulating material is molded into a block enclosing the joints but leaving the sockets sufficiently exposed to receive the plugs to make electric connections. The sockets are arranged in the block in an orderly array corresponding to that of the plugs so that the plugs can be simultaneously inserted into the sockets or withdrawn therefrom. Gang connectors of this kind are relatively expensive to make and difficult to repair if one or more of the individual connector units become damaged or ineffective.

It is an object of the present invention to provide a gang connector which is simple in structure, easy to assemble and disassemble, easy to repair, and low in cost. Another advantageous feature of the invention is that instead of using connectors of the male-and-female variety, the two gang connector members may be identical in structure. Certain embodiments of the invention are illustrated on the drawing, of which—

Figure 1 is an exploded perspective view of an embodiment of the invention;

Figure 2 is a fragmentary plan view of the same embodiment;

Figure 3 is a sectional view on a larger scale, taken on the line 3—3 of Figure 2;

Figure 4 is a fragmentary perspective view, on a larger scale, of one of the elements shown in Figure 1, together with a complementary connector member;

Figure 5 is a fragmentary perspective view of parts of a modified form of the invention;

Figure 6 is a perspective view of a connector element adapted to be mounted on a plate shown in Figure 7;

Figure 7 is a perspective view, on a larger scale, of a fragment of one of the parts shown in Figure 5; and

Figure 8 is a section on the line 8—8 of Figure 7.

The embodiment of the invention illustrated in Figure 1 comprises two rigid plates 10 and 12 of insulation. Each of these plates has one or more apertures or holes 14 therethrough, the apertures of each plate registering with those of the other plate when the plates are in face-to-face alignment as shown. The holes 14 are square but may be otherwise shaped if desired.

Through one or more holes 14 of each plate a conductor 16 extends, these conductors being provided in pairs for corresponding holes in the two plates. Each conductor 16 is characterized by a portion 18 which projects from the outer face of the plate through which the

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conductor extends and two diverging ears 20 which project from the inner face of said plate and overlap portions of the inner face of the plate adjacent to the hole. Each ear 20 preferably makes an oblique angle with the plane of the inner face of the plate, so that when the plates are pressed together as in Figure 3, the extremities of the ears of one conductor press against the extremities of the ears of the opposing conductor. As the conductors are preferably made of a metal such as brass having an appreciable resilience, when the opposing ears 20 are pressed against each other with sufficient force to decrease the angles between the ears and the planes of the inner faces of the plates, the restoring force inherent in the distorted ears maintains a firm pressure between opposing ears and thus promotes good electrical contacts. In order to maintain correct mutual alignment of the plates when they are pressed together, a pin 22 may be mounted in one of them to project into a suitably placed hole in the other plate. Clips 24 are provided to hold the plates together close enough to maintain pressure between the mutually engaged ears 20 between them. As shown, there are two clips 24, each comprising a U-shaped member of channel stock, the channel width being just sufficient to span the edges of the assembled plates 10 and 12 when the latter are pressed together sufficiently to distort the mutually engaged ears 20 between them. The dimensions of the U-shape of each clip 24 is such that the clip fits over an end margin and about half of each side margin of the assembled plates. Thus the plates are positively held along practically their entire peripheries. To hold the clip in place, locking lugs 26 may be provided to project from the side edges of the plates to engage in suitable holes 28 in the ends of the clips.

The portion 18 of each conductor 16 which projects from the outer face of a plate is adapted to be connected to a wire. In the form of the conductor illustrated in Figures 3 and 4, this portion consists of a tongue adapted to fit into the channel of a female connector member 30 of any of the several well-known varieties designed to be assembled with a plane tongue to make a good electrical connection. The connector member 30 is adapted to be permanently attached to the end of a wire 32. The conductor 16 can readily be made by taking a strip of brass of suitable length and of a width slightly less than a side of one of the square apertures 14. This strip is folded upon itself at its transverse median, the portions adjacent to the fold being pressed into face-to-face contact so that they form the tongue 18. The portions of the strip adjacent to the tongue diverge sufficiently to engage opposing sides of the aperture 14 through which the conductor extends. The extremities of the strip are bent more sharply outward to form the ears 20. To prevent the conductors 16 from falling out of the holes 14 when the plates 10 and 12 are separated, an outwardly projecting boss 34 may be formed on each side of the conductor to snap over an outer edge of the hole 14.

Another form 36 of conductor is shown in Figures 6 and 8. This form is made by cutting a suitable blank from a sheet of brass and bending the blank to a channel form adapted to be permanently crimped on the end of a wire 38 with or without soldering or welding. The sides of the channel have parallel extensions 40 adapted to fit against the sides of an aperture 42 through a plate 10' or 12'. The extensions 40 terminate in diverging ears 20' which may be similar in shape and arrangement to the ears 20 hereinbefore described.

To facilitate mounting a conductor 36 on a plate after it has been attached to a wire 38, each aperture 42 is connected to the adjacent edge of the plate by a slot 44 which is narrower than the aperture 42 but is wide enough to permit the extensions 40 to pass through to

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the aperture when they are pressed toward each other sufficiently. In other respects the plates 10' and 12' may be similar to the plates 10 and 12 and may be similarly pressed together by clips 24 which engage the outer margins of the plates when the latter are near enough to each other to distort the pairs of mutually engaged ears 20'.

The plates may be made with any suitable number of apertures consistent with the size and rigidity of the plates. Since each pair of ears presses against the opposing pair sufficiently to distort and be distorted thereby, there are no loose contacts in such a gang connector. Furthermore, when the plates are separated, it is easy to remove and replace any of the individual conductors.

I claim:

1. An electric connector comprising two rigid normally parallel plates of insulation having mutually registering apertures therethrough, a conductor projecting through each said aperture, each said conductor consisting of a strip of resilient metal doubled upon itself to form a flat tongue projecting from one face of one of said plates, the extremities of each said strip engaging the opposite face of its plate and extending away from each other at acute angles to the plane of its plate, and means clamping the margins of the plates with the extremities of the conductors in one plate pressing against the extremities of the corresponding conductors in the other plate.

2. An electric connector as described in claim 1, said clamping means comprising two U-shaped channel members each of which overlaps the margins along an end and approximately half of both side edges of the mutually remote faces of said plates.

3. An electric connector comprising two rigid normally parallel plates of insulation having mutually registering apertures therethrough, a conductor projecting through

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each said aperture, each said conductor consisting of a strip of resilient metal doubled upon itself to form a flat tongue projecting from one face of one of said plates, each said conductor having portions within its aperture spaced to engage the sides of said aperture and extremities extending away from each other at acute angles to the plane of its plate, a boss on each said conductor engaging the plate at said aperture to lock said conductor releasably in place, and clamping means engaging the margins of said plates to press the extremities of the conductors of one plate in contact with the extremities of corresponding conductors in the other plate.

4. An electric connector as described in claim 3, said clamping means comprising two U-shaped channel members each of which overlaps the margins along an end and approximately half of both side edges of the mutually remote faces of said plates.

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