

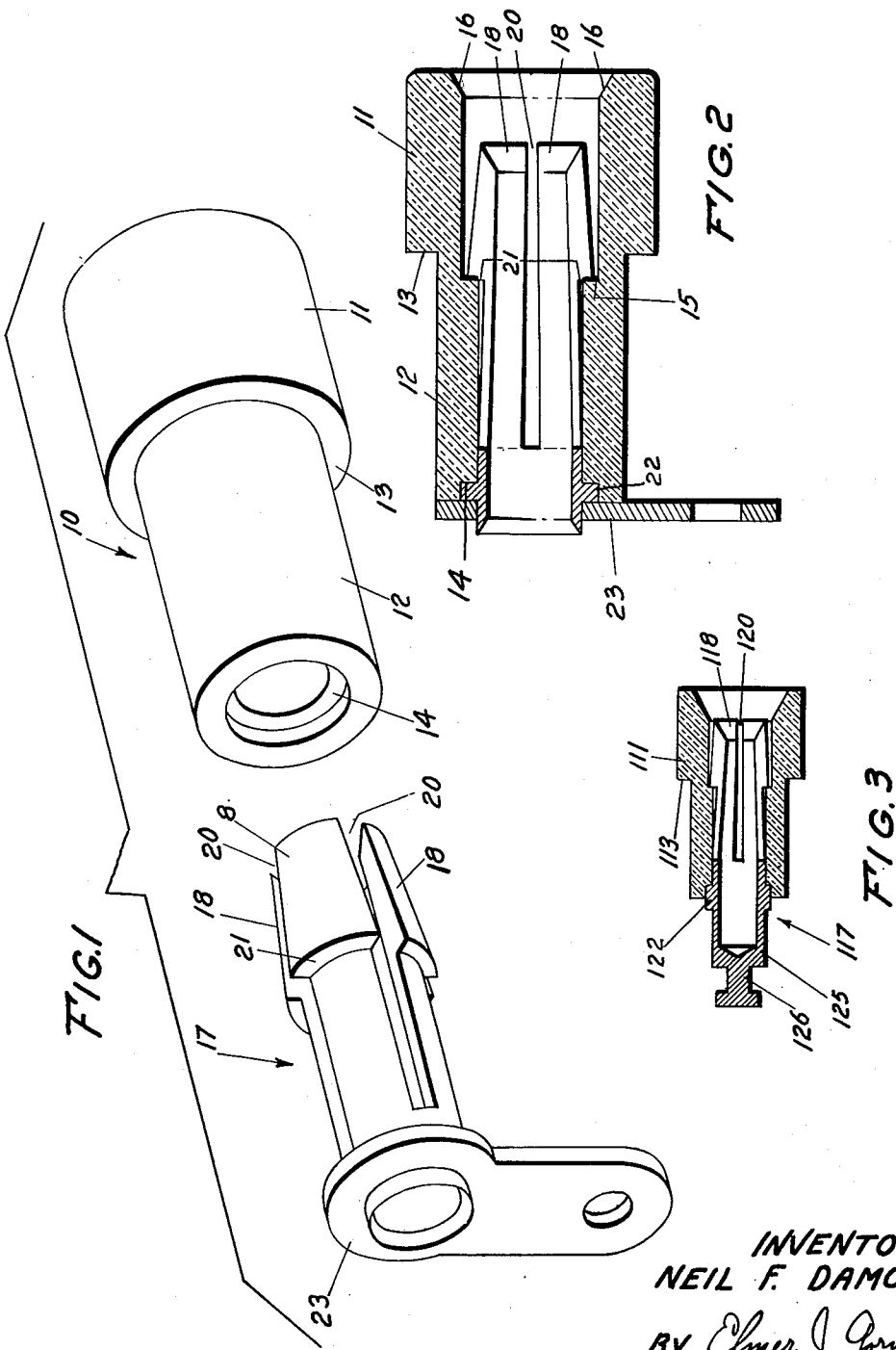
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N. F. DAMON

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DETACHABLE ELECTRICAL CONNECTOR

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INVENTOR
NEIL F. DAMON
BY *Elmer J. Gorn*
ATTORNEY

UNITED STATES PATENT OFFICE

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DETACHABLE ELECTRICAL CONNECTOR

Neil F. Damon, Watertown, Mass., assignor to
Raytheon Manufacturing Company, Newton,
Mass., a corporation of Delaware

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This invention relates to detachable electrical connectors, and more particularly to those of the smallest size adapted to receive a standard 0.080 inch probe.

When a connector of this size is used as a jack and mounted in a panel, it becomes necessary to insulate the conductive part of the jack from the panel. An insulated bushing is usually used for this purpose. If soldered connections are to be made to the assembled jack, the soldering heat may deform or otherwise affect the insulated bushing. Such damage can be avoided by making the electrical connections to the conductive part of the connector before it is inserted in the bushing. Such a jack must be firmly attached to the panel and the conductive part must be firmly attached within the insulated bushing to form a structure that has a minimum of bulk. By the present invention, such a structure is made by forming the insulating bushing as a tube with an interior shoulder, and the conductive part of the connector has a tube of conductive material with tapered resilient fingers having latches formed at one end that slip past the shoulder on the inside of the bushing when the conductive part is inserted and spring outward to retain the conductive part within the bushing after insertion. With the construction of this invention, it is possible to solder or otherwise fasten the conductive part of the connector to the desired circuit while the conductive part of the connector is outside of the bushing. As pointed out above, this prevents the heat of the soldering operation from damaging the bushing. Since the two parts of the connector are essentially two concentric tubes, the connector need be very little larger than the probe or other conductor to be inserted into it. Thus, a connector of this construction lends itself to use in miniaturized equipment.

Other and further advantages of this invention will become apparent as the description thereof progresses, reference being had to the accompanying drawings, wherein:

Fig. 1 is an exploded isometric view of a preferred embodiment of the connector;

Fig. 2 is a longitudinal section of the embodiment of Fig. 1 when the connector is assembled; and

Fig. 3 is a modified embodiment of the invention.

In Fig. 1, the reference numeral 10 designates a bushing of insulating material made in tubular form with an enlarged portion 11 at one end and a restricted portion 12 at the other with a shoulder 13 formed between them. This shoulder 13 forms a support when the bushing is panel mounted. A recess 14 is formed on the inside of the restricted portion 12 of the bushing 10. The inside diameter of the enlarged section 11 is larger

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than that of the restricted section 12. Another shoulder 15 is formed on the inside of the bushing 10 where these two sections meet. The opening at the enlarged end 11 of the bushing 10 is formed with a taper 16 to receive a probe (not shown). The conductive part 17 of the connector is tabular in shape with one end formed into tapered fingers 18 separated by slots 20. Latches 21 are formed on at least one and preferably each of these fingers 18. An annular flange 22 is formed near the end of the conductive piece 17 opposite to the fingers 18. A lug 23 is fitted over the same end of the conductive piece 17 against the flange 22 and fastened to it by any convenient method such as taking and soldering to form a means for connecting one or more conductors to the conductive piece 17.

In use, one of the conductors to be connected, or a point at which a voltage is to be measured, is connected to the lug 23, and the conductive part of the connector 17 is inserted in the bushing 10 from the left end, as seen in Fig. 1. When the conductive part 17 is inserted into the interior of the bushing 10, the fingers 18 are compressed together in passing through the restricted portion 12 of the bushing until the latches 21 pass the shoulder 15 of the bushing, at which point they expand to latch the conductive part 17 into the bushing 10. At the same time, the flange 22 contacts the recess 14 to prevent further penetration by the conductive part 17. The conductive piece 17 is firmly held within the bushing 10 by the latching action of the fingers 18 and the contact of the flange 22 with the shoulder 14. The conductive piece 17 can easily be removed from the bushing 10 by pressing inward on the fingers 18 sufficiently to release the latches 21 to permit the conductive piece 17 to pass out through the restricted portion 12 of the bushing 10.

If desired, the conductive piece can be formed with an integral turret type terminal, as shown in Fig. 3. In this modification, the part 125 of the conductive piece 117 extending beyond the flange 122 is formed with a restriction 125 near its end about which the conductor or conductors to be connected to the conductive piece 17 are wrapped and soldered. The rest of the connector of Fig. 3 is the same as that shown in Figs. 1 and 2. Its parts are indicated by the same reference numbers as the embodiment of Figs. 1 and 2 with 100 added. The shoulder 113 is only needed where the connector is to be panel mounted. Otherwise, the insulating part 110 may have a constant diameter.

This invention is not limited to the particular details of construction, materials and processes described, as many equivalents will suggest themselves to those skilled in the art. It is, accordingly, desired that the appended claims be given

a broad interpretation commensurate with the scope of the invention within the art.

What is claimed is:

1. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end separated from the region of lesser cross section by a shoulder, a tubular conductive member adapted to be inserted within said support member, said conductive member having a plurality of resilient fingers at one end and a flange near the other end adapted to fit into the recesses in the region of lesser cross section of the insulating member, at least one of said fingers having a latch comprising an enlarged end of said finger tapering to the end of the finger and forming a shoulder at the rear adapted to engage the said shoulder to retain the conductive member within the support member.

2. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end separated from the region of lesser interior cross section by a shoulder, a tubular conductive member adapted to be inserted within said support member, said conductive member having at least one tapered resilient finger at one end and a flange near the other end adapted to fit into the recesses in the region of lesser cross section of the insulating member, said finger having a latch comprising an enlarged end of said finger formed with a shoulder at the rear of the tapered portion adapted to engage the said shoulder to retain the conductive member within the support member.

3. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end and a region of lesser cross section near the other end with a recess at the outer end of the region of lesser cross section, a shoulder separating the regions of lesser and greater interior cross section, a tubular conductive member adapted to be inserted within said support member, said conductive member having a flange near one end adapted to fit into the recess in the region of lesser cross section of the insulated member and resilient fingers at the other end, each finger having a latch comprising an enlarged end of said finger tapering to the end of the finger and forming a shoulder at the rear adapted to engage the shoulder separating the regions of lesser and greater interior cross section of the support member to retain the conductive member within the support member.

4. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end and a region of lesser cross section near the other end separated by a shoulder, a tubular conductive member adapted to be inserted within said support member, said conductive member having resilient fingers at one end and a flange near the other end adapted to fit into the recesses in the region of lesser cross section of the insulating member, each finger having a latch comprising an enlarged end of said finger tapering to the end of the finger and forming a shoulder at the rear adapted to engage the shoulder separating the regions of lesser and greater interior cross section of the support member to retain the conductive member within the support member and a terminal formed integral

with the end of the conductive member opposite to the fingers.

5. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end and a region of lesser cross section near the other end with a recess at the outer end of the region of lesser cross section, a shoulder separating the regions of lesser and greater interior cross section, a tubular conductive member adapted to be inserted within said support member, said conductive member having a flange near one end adapted to fit into the recess in the end of the region of lesser cross section of the insulated member and tapered resilient fingers at the other end, each finger having a latch comprising an enlarged end of said finger formed with a shoulder at the rear of the tapered portion adapted to engage the shoulder separating the regions of lesser and greater interior cross section of the support member to retain the conductive member within the support member.

6. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end and a region of lesser cross section near the other end separated by a shoulder, a tubular conductive member adapted to be inserted within said support member, said conductive member having a plurality of tapered resilient fingers at one end and a flange near the other end adapted to fit into the recesses in the region of lesser cross section of the insulating member, at least one of said fingers having a latch comprising an enlarged end of said finger formed with a shoulder at the rear of the tapered portion adapted to engage the shoulder separating the regions of lesser and greater interior cross section of the support member to retain the conductive member within the support member and a terminal formed integral with the end of the conductive member opposite to the fingers.

7. A detachable electrical connector comprising a tubular insulating support member having a region of greater interior cross-sectional area near one end and a region of lesser cross section near the other end with a recess at the outer end of the region of lesser cross section, a shoulder separating the regions of lesser and greater interior cross section, a tubular conductive member adapted to be inserted within said support member, said conductive member having a flange near one end adapted to fit into the recess in the region of lesser cross section of the insulated member and resilient fingers at the other end, each finger having a latch comprising an enlarged end of said finger tapering to the end of the finger and forming a shoulder at the rear adapted to engage the shoulder separating the regions of lesser and greater interior cross section of the support member to retain the conductive member within the support member and a terminal formed integral with the end of the conductive member opposite to the fingers.

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