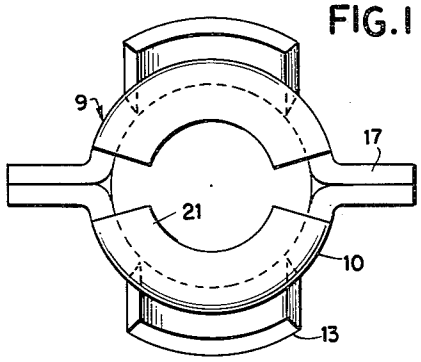
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ELECTRICAL CONNECTORS

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FIG. 1



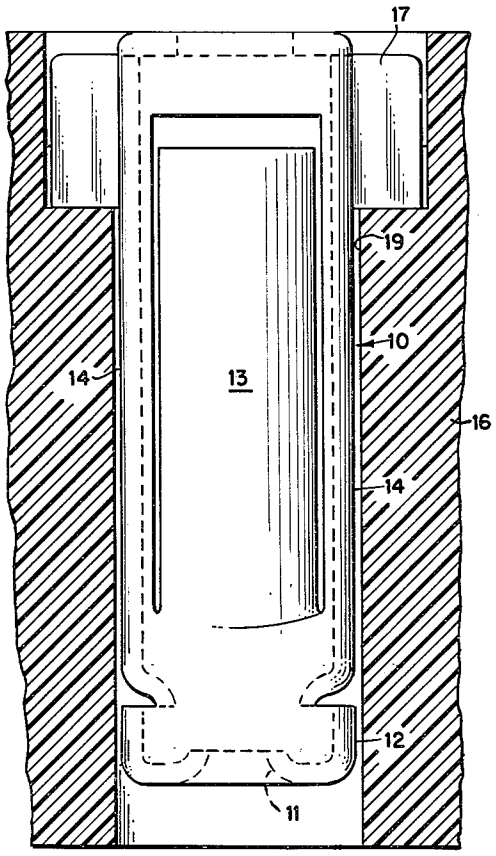
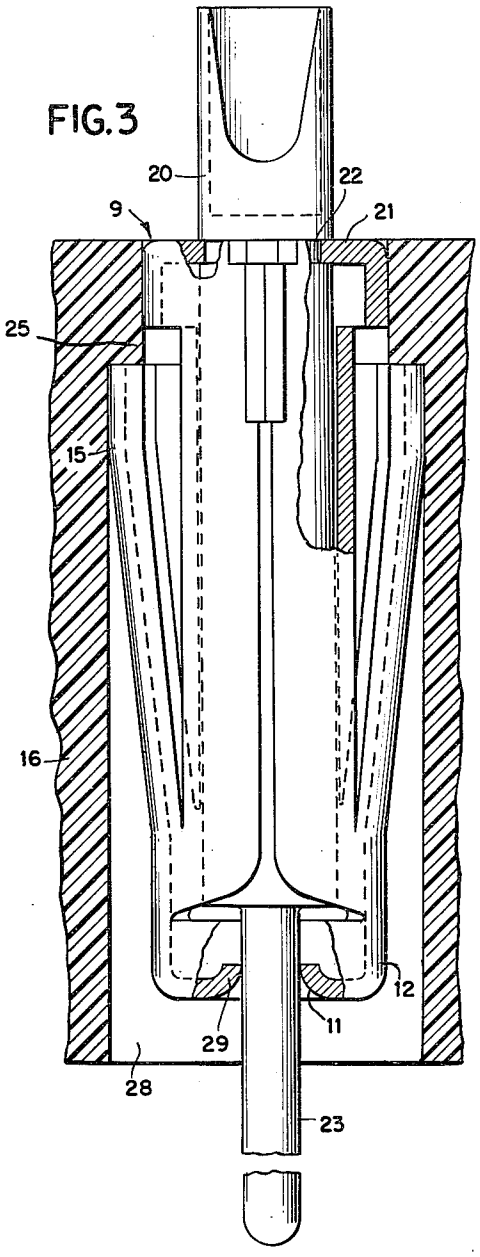


FIG. 2

FIG. 3



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FIG. 4

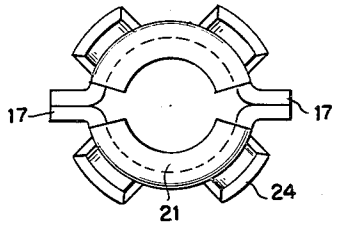
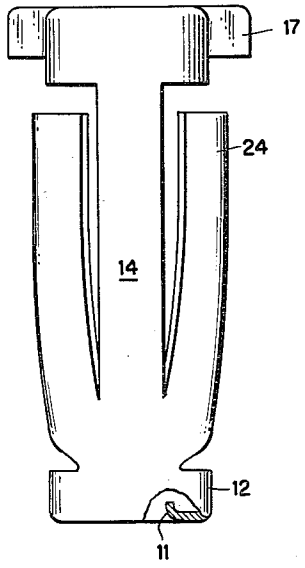


FIG. 5



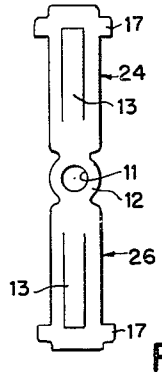
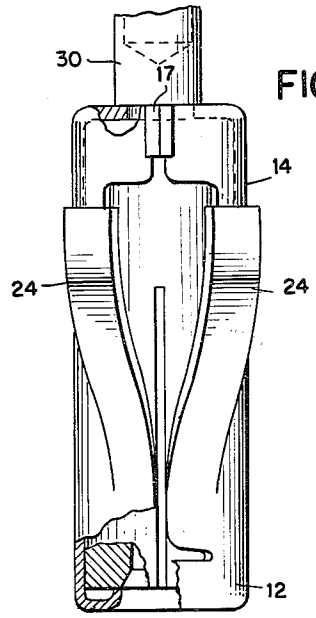
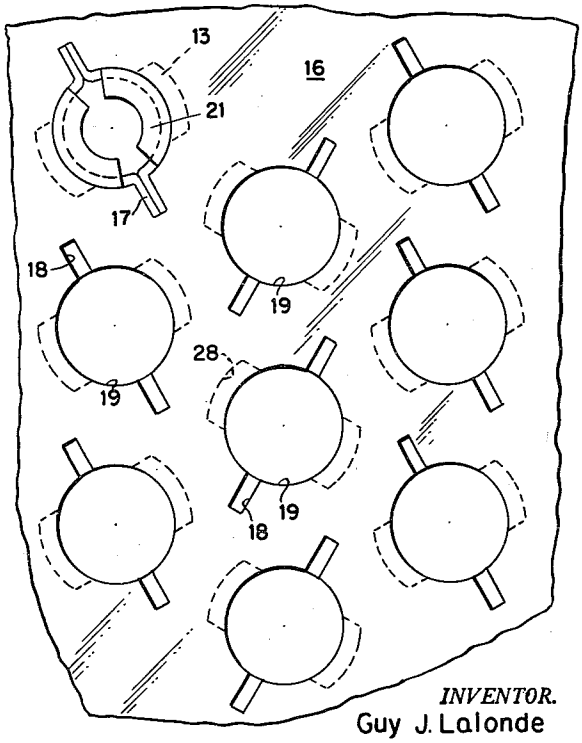


FIG. 7

FIG. 8

FIG. 6





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ELECTRICAL CONNECTORS

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5 Claims. (Cl. 339—176)

This invention relates to electrical connectors of the pin and socket type which are customarily used in a dielectric supporting block for the purpose of establishing a plurality of contacts.

Where a large number of electrical contacts are to be used in a dielectric block, it is important to make the contacts as small as possible without sacrificing the strength and dependability of the connection. In addition, such miniaturized contacts must withstand repeated assembly and disassembly as well as the effect of test probes during the useful life of the device.

Accordingly, it is an object of the present invention to provide an electrical connector assembly which may be made to occupy a minimum amount of space and furnish a dependable contact structure.

Another object of the present invention is to provide an electrical connector assembly which may be assembled and disassembled with ease.

Still another object of the present invention is to provide an electrical connector assembly which will lend itself to the use of male as well as female contacts, within an anchoring socket.

A further object of the present invention is to provide an electrical connector assembly in which the contact members will remain in substantially the same relationship with respect to each other over prolonged periods of use.

A feature of the present invention is its use of a solid ring at the base of the socket member to prevent test probes from destroying the dimensional stability of the female contact within the said socket member.

Another feature of the present invention is its use of outwardly extending leaf members to lock the socket member into the supporting connector block.

Still another feature of the present invention is its use of laterally extending ears on the socket member to prevent the said socket from being forced out of the supporting dielectric block.

The invention consists of the construction, combination and arrangement of parts, as herein illustrated, described and claimed.

In the accompanying drawings, forming a part hereof are illustrated two forms of embodiment of the invention and in which:

FIGURE 1 is a view in top plan of a socket member made in accordance with the present invention.

FIGURE 2 is a view in side elevation of the socket member shown in FIGURE 1.

FIGURE 3 is a view in side elevation partly broken away of a complete socket and male contact member taken at right angles to the showing of FIGURE 2.

FIGURE 4 is a top plan view of a second embodiment of a socket member made in accordance with the present invention.

FIGURE 5 is a view in side elevation of the socket member shown in FIGURE 4.

FIGURE 6 is a view in side elevation of a female contact within the socket member shown in FIGURE 5 taken at right angles to the showing of FIGURE 5.

FIGURE 7 is a top plan view of a fragment of a connector block showing the manner in which the contacts are staggered with respect to each other to prevent electrical discharge.

FIGURE 8 is a top plan view on a reduced scale of a flat blank from which the socket shown in FIGURES 1, 2, and 3, may be formed.

Referring to the drawings and particularly to FIGURES 1 and 2, 10 indicates the somewhat tubular body member of a socket 14 such as is used in the electrical connector assembly of the present invention. The body 10 may be spun out of a single blank of metal 26, shown in FIGURE 8, or it may be drawn upwardly from a blank having a central opening 11 therein. As a result of the formation of the body 10, there is provided a split contact receiving socket 14, having a central opening 11 at the bottom thereof surrounded by a solid ring 12 of metal which can not be sprung out of shape by the introduction of contact members or probes. Lateral leaf members 13 are struck from the side walls of the socket 14 of the body 10. The leaf members 13 are somewhat inwardly bent as indicated at 15 in FIGURE 3 to act as anchors for the socket member 14 within a dielectric block 16. The socket 14 is formed with outwardly disposed ear members 17 at the top thereof. The ear members 17 are received within the dielectric block 16 as shown in FIGURE 2 and form a stop member to prevent the socket 14 from being forced through the dielectric block when a contact member is inserted therein. The dielectric block 16 is provided with slots 18 best shown in FIGURE 7 to receive the ears 17 and hold the upper portion of the socket together tightly. When it is desired to insert the body of the socket member 14 into the dielectric block, it is merely necessary to push the socket member into the bore 19 of the dielectric block 16. The outwardly extending leaf members will be compressed by the entrance portion of the bore 19 which is smaller than the span of the outstretched leaves. As soon as the leaf members are past the entrance portion of the bore and at the same time that the ears 17 bottom within the slots 18 of the dielectric block 16, the said leaf members 13 will spring outwardly into elongated recesses 28 cut into the bore 19. The recesses are shorter than the bore 19 and terminate in shoulders 25 which enable the leaves to lock the socket member 14 securely within the block 16. It will be seen from an examination of FIGURE 3 that the socket member can not be forced down because of the ears 17 and can not be pulled out of the bore 19 because of the leaf members 13.

The male plug 20 shown in FIGURE 3 may be slipped within the socket 14. The socket can also hold a female contact member. The socket 14 has an inwardly turned lip 21 at the top thereof which engages a groove 22 in the contact member 20 to lock it within the socket member. The contact 20 can be removed thereafter only by springing the inwardly turned lip 21 to release it. As shown in FIGURE 3, the contact 20 is provided with an elongated pin portion 23 which extends through the opening 11 in the socket member 14. The elongated pin portion 23 must be used to engage a female contact member (not shown). On the other hand, the socket member 14 may be used to anchor a female contact member as hereinabove stated. An inwardly spun rim 29 on the opening 11 serves to center the pin 23 and strengthen the socket at this point. It also acts as a guide for the female contact when the pin 23 is inserted into it. The spun rim 29 in connection with solid ring 12 prevents the distortion of the female contact when test probes are inserted.

In the event that it is desired to remove the socket member 14 from the dielectric block 16, or to remove a contact from the socket it is merely necessary to insert a thin forked tool (not shown) into the recess 28 of the bore 19 of the dielectric block 16 and along the body 10 of the socket member 9 thereby compressing the outwardly extending leaf member 13 until they can be slid past the opening in the dielectric block 16. In this

manner rapid interchangeability of contact parts is possible with the present construction.

Referring to FIGURE 4 there is shown a second embodiment of the present invention in which the socket member **14** is formed with four outwardly extending leaf members **24**. Each half of the split contact receiving socket **14** has two of the leaf members **24** struck therefrom. The bottom of the socket **14** is provided with the solid ring construction **12** having the central opening **11** therein hereinabove described in connection with FIGURES 1, 2 and 3. The leaf members **24** extend outwardly from the body **10** of the contact receiving socket **14**, as best shown in FIGURE 6. The top of the contact receiving socket **14** is provided with laterally extending ears **17** in the same manner as that hereinabove described.

The operation of the second embodiment of the socket member **14** is identical to that of the first embodiment with the exception of the plurality of leaf members **24** which distribute the load more evenly beneath the restricted portion **20** of the dielectric block **16**.

Where a large number of small electrical contacts are mounted in a single dielectric block it is important to prevent electrical leakage or flash-over between them. In FIGURE 7 there is shown a contact assembly arrangement employing the sockets **14** of the present device with the laterally extending ears **17** so disposed with respect to one another as to provide the longest possible path therebetween.

FIGURE 6 illustrates the manner in which a female contact member **30** is retained by the socket member **14**. The male contact **20** can be inserted through the opening **11** in the socket **14** to complete the connection.

Having thus fully described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States, is:

1. An electrical socket contact block structure of the pin and socket type comprising a dielectric block, a plurality of transverse bores in said block, spaced elongated recesses in the walls of the transverse bores, said recesses terminating short of the top of the block face to form an undercut portion within the bores, slots in the top of the block extending laterally from the bores and communicating therewith, a contact anchoring socket member in each of said bores formed of a single flat metal blank, a solid ring-shaped portion at one end of the socket blank disposed normal to the longitudinal axis of the bore, opposed wall members integral with and extending from the ring-shaped portion in a direction substantially normal thereto to form a split contact receiving element, at least one leaf member struck from each wall member outwardly bent and disposed within one of the elongated block recesses and in abutting contact with the undercut portion of the block to prevent the socket from being pulled from the bore, upstanding ears integral with the free ends of the wall members and extending laterally therefrom into the lateral slots in the block whereby the socket is prevented from moving downwardly thorugh the bore, said leaf and ear members serving to lock the sockets within the bores.

2. An electrical socket contact block structure of the pin and socket type comprising a dielectric block, a plurality of transverse bores in said block, spaced elongated recesses in the walls of the transverse bores, said recesses terminating short of the top of the block face to form an undercut portion within the bores, slots in the top of the block extending laterally from the bores and communicating therewith, a contact anchoring socket member in each of said bores formed of a single flat metal blank, a solid ring-shaped portion at one end of the socket blank disposed normal to the longitudinal axis of the bore, opposed wall members integral with and extending from the ring-shaped portion in a direction substantially normal thereto to form a split contact receiving element, an inwardly turned lip on the free end of each wall member, at least one leaf member struck from each wall member outwardly bent and disposed within one of the elongated block recesses and in abutting contact with the undercut portion of the block to prevent the socket from being pulled from the bore, upstanding ears integral with the free ends of the wall members and extending laterally therefrom into the lateral slots in the block whereby the socket is prevented from moving downwardly through the bore, said leaf and ear members serving to lock the sockets within the bores, a pin contact member receivable within the socket member, and a groove on the pin contact receivable within the inwardly turned lip to lock the pin and socket members together.

3. An electrical socket contact block structure of the pin and socket type comprising a dielectric block, a plurality of transverse bores in said block, spaced elongated recesses in the walls of the transverse bores, said recesses terminating short of the top of the block face to form an undercut portion within the bores, slots in the top of the block extending laterally from the bores and communicating therewith, a contact anchoring socket member in each of said bores formed of a single flat metal blank, a solid ring-shaped portion at one end of the socket blank disposed normal to the longitudinal axis of the bore, opposed wall members integral with and extending from the ring-shaped portion in a direction substantially normal thereto to form a split contact receiving element, at least one leaf member struck from each wall member outwardly bent and disposed within one of the elongated block recesses and in abutting contact with the undercut portion of the block to prevent the socket from being pulled from the bore, upstanding ears integral with the free ends of the wall members and extending laterally from the margins of the wall members into the lateral slots in the block whereby the socket is prevented from moving downwardly through the bore, said leaf and ear members serving to lock the sockets within the bores.

4. An electrical socket contact block structure of the pin and socket type comprising a dielectric block, a plurality of transverse bores in said block, spaced elongated recesses in the walls of the transverse bores, said recesses terminating short of the top of the block face to form an undercut portion within the bores, slots in the top of the block extending laterally from the bores and communicating therewith, a contact anchoring socket member in each of said bores formed of a single flat metal blank, a solid ring-shaped portion at one end of the socket blank disposed normal to the longitudinal axis of the bore, opposed wall members integral with and extending from the ring-shaped portion in a direction substantially normal thereto to form a split contact receiving element, at least one leaf member struck from the margins of each wall member outwardly bent and disposed within one of the elongated block recesses and in abutting contact with the undercut portion of the block to prevent the socket from being pulled from the bore, upstanding ears integral with the free ends of the wall members and extending laterally therefrom into the lateral slots in the block whereby the socket is prevented from moving downwardly through the bores, said leaf and ear members serving to lock the sockets within the bores.

5. An electrical socket contact block structure of the pin and socket type comprising a dielectric block, a plurality of transverse bores in said block, spaced elongated recesses in the walls of the transverse bores, said recesses terminating short of the top of the block face to form an undercut portion within the bores, slots in the top of the block extending laterally from the bores and communicating therewith, a contact anchoring socket member in each of said bores formed of a single flat metal blank, a solid ring-shaped portion at one end of the socket blank disposed normal to the longitudinal axis of the bore, opposed wall members integral with and extending from the

ring-shaped portion in a direction substantially normal thereto to form a split contact receiving element, an inwardly turned lip on the free end of each wall member, at least one leaf member struck from the margins of each wall member outwardly bent and disposed within one of the elongated block recesses and in abutting contact with the undercut portion of the block to prevent the socket from being pulled from the bore, upstanding ears integral with the free ends of the wall members and extending laterally from the margins of the wall members into the lateral slots in the block whereby the socket is prevented from moving downwardly through the bore, said leaf and ear members serving to lock the sockets within the bores, a pin contact member receivable within the socket member, and a groove on the pin contact receivable within the inwardly turned lip to lock the pin and socket members together.

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