A two-part connector assembly wherein the elements are latched together by a latch on one element which latches to a notch on the other element. The latch, in cross-section, is T-shaped. To release, pressure is applied to one arm of the T to rock it about the shank of the T, which is integral with the casing. The contacts are rear-clip insertion and extraction types, with the times for contact retention integral with the inside of the bore in which the contact is located.

8 Claims, 1 Drawing Figure
CONTACT RETENTION ASSEMBLY

This is a continuation of application Ser. No. 233,622, filed Mar. 10, 1972, and now abandoned.

CROSS REFERENCE TO RELATED APPLICATIONS

This application is filed under the provisions of 35 U.S.C. 119 with claim for the benefit of the filing of an application covering the same invention filed Mar. 12, 1971, Ser. No. 6650/71, in Great Britain.

FIELD OF THE INVENTION

The invention relates in general to latched electrical connectors and, more particularly, to rear releasable electrical connectors.

SUMMARY OF THE INVENTION

According to the present invention there is provided an electrical connector assembly which includes a first connector element and a second connector element. The two elements can be fitted together with the contacts in said first element in engagement with the contacts in said second element. The outer casing of the first connector fits snugly inside the second connector when the two elements are mated, and the two connector elements are held in the mated position by a latch means. The latch means includes a plurality of latches each comprising a generally T-shaped latch member formed integral with the outer casing of the first connector element and joined thereto by a shank forming the upright of the T. One of the arms of the T has a hook which when the elements are mated fits behind a rear-facing shoulder on the other of said elements. The other arm of each said T acts as a lever which when depressed rocks the T to disengage its hook to allow the elements to be unmated.

The advantages of the invention, both as to its construction and mode of operation, will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

The FIGURE depicts a side view, partly in section, of a connector assembly embodying the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing there is shown a socket connector element 1 and a plug connector element 2, each of which can accommodate twelve contacts in three rows each of four contacts. The socket element has a rubber grommet 3 at its rear which fits into the contact supporting member or biscuit 4. As can be seen, there are aligned contact receiving bores in the grommet and the biscuit, and for each bore the latter has a shoulder 5 which locates the contact when pushed forward into the bore. This contact has a collar 6 between its ends which provides a front shoulder for engagement with the shoulder 5 and a rear shoulder. The biscuit also has, for each contact bore, a set of tines, three in the case shown, one of which is shown in section at 7 and another is shown at 8. These are formed integral with the biscuit, and act as retainers in the rearward direction for a contact when the latter, with a wire soldered to it, is in place in the bore. As can be seen, the grommet has an external groove which receives an internal collar on the inside of an end shell 9.

The arrangements for the contacts on the plug side are generally similar to those for the socket side, as can be seen from the drawing. Contacts when wired up are inserted into the bores from the rear side thereof and when contact removal is called for the end shell such as 9 is removed by undoing a clamp (not shown). Then a contact is removed by fitting the end of a split tubular tool over the contact's wire and pushing the tool into the bore so that it slides between the wire and the inside of the grommet until it abuts the rear shoulder of the collar 6. In this position it deflects the tines 7 outwardly so that the wire and the contact and the tool can be withdrawn rearwardly. Insertion uses a similar tool which is used to guide the contact and wire through the grommet as far as the stop shoulder 5.

When the elements are mated as shown, an O ring 10 in the plug element is compressed to form a good seal and the elements are held together by two or more latches. One of these latches is shown in detail and it includes a generally T-shaped portion 11 which is integral with the outer casing of the socket element. This T has a short shank, and its front arm has an inwardly facing hook which, in the mated condition fits behind a rear-facing shoulder 12 on the plug element. To un latch, the rear arm of the T is depressed, which rocks the T about its shank, thus unlatching. In the rectangular assembly shown, two such latches are fitted, the other being indicated at 13.

Other shapes of connector such as circular connectors are also possible. In this case one can use two or more latches disposed round the circumference of the casing.

What is claimed is:

1. An electrical connector assembly comprising: a one-piece unitary body of insulation material having a plurality of passages extending therethrough from a front face to a rear face; an electrical contact positioned axially in each of said passages, each said contact being insertable from the rear of said body into its corresponding passage and having an enlarged section defining a rearwardly facing shoulder; means within each said passage limiting movement of the respective contact therein toward the front end of said passage; stop means associated with each said passage engageable with said rearwardly facing shoulder for limiting rearward movement of said contact when said contact is in the most forward position in said passage permitted by said movement limiting means;

2. said stop means for each said passage comprising a part of said unitary body extending rearwardly from said rear face to circumferentially spaced locations about said passage; and said part being resiliently radially expandable to permit said contact enlarged section to pass therethrough upon forward insertion of the contact into said passage, said part contracting behind said contact rearwardly facing shoulder when said contact is in said forward position, and said contact being removable from the passage from the rear of said body by expanding said part sufficiently to per-
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mit said contact enlarged section to pass rearwardly therethrough.

2. A connector assembly as set forth in claim 1 wherein:
   the inner surface of the rear section of said part flares outwardly to provide an entrance ramp for insertion of the contact into the passage from the rear.

3. A connector assembly as set forth in claim 1 wherein:
   each said contact has a rear section behind said enlarged section extending rearwardly from said rear face of said body; and
   said part engages said contact rear section.

4. A connector assembly as set forth in claim 1 wherein:
   said part comprises a plurality of circumferentially spaced tines.

5. A connector assembly as set forth in claim 1 wherein:
   each said contact enlarged section comprises a collar defining a forwardly facing shoulder; and
   said movement limiting means comprises a rearwardly facing shoulder in each passage engageable by said contact forwardly facing shoulder.

6. A connector assembly as set forth in claim 1 including:
   a resilient grommet adjacent to said rear face of said body having passages therethrough in axial alignment with said passages in said body.

7. A connector assembly as set forth in claim 1 wherein:
   said part is formed with a forwardly facing shoulder engageable with said rearwardly facing shoulder of said contact enlarged section.

8. A connector assembly as set forth in claim 7 wherein:
   the inner surface of the section of said part forward of said forwardly facing shoulder thereon forms a continuation of the wall of said passage.
It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 1, line 14, cancel "latched"
Col. 1, lines 20-37, cancel and substitute the following:
---an electrical connector assembly having a body of insulation material formed with a plurality of passages therethrough, each receiving an electrical contact. The contacts are insertable into the passages from the rear of the body and are also removable from the rear of the body. A plurality of integral, resilient tines extend rearwardly from the rear face of the body around each contact passage. The tines are formed with forwardly facing shoulders which abut against a collar on the contact to restrain the contact from rearward movement in the passage in which it is mounted. The tines may be expanded by suitable tool to permit the contact to be removed from the rear of the passage.---

Signed and sealed this 20th day of May 1975.

(SEAL)
Attest:
RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents
and Trademarks