

Aug. 4, 1942.

H. P. CHANDLER

ELECTRIC CONNECTOR

Filed Aug. 2, 1941

2,291,793

2 Sheets-Sheet 1

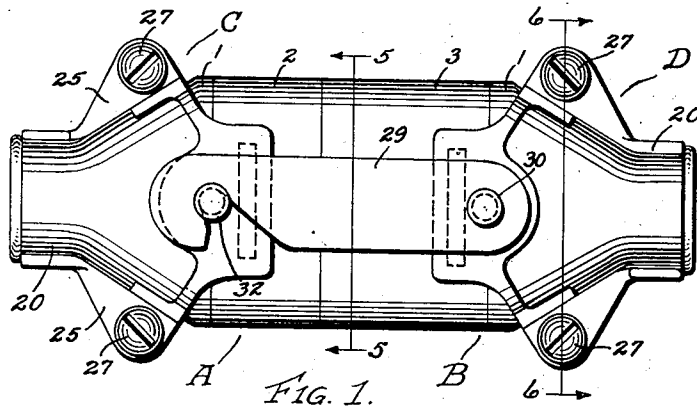


FIG. 1.

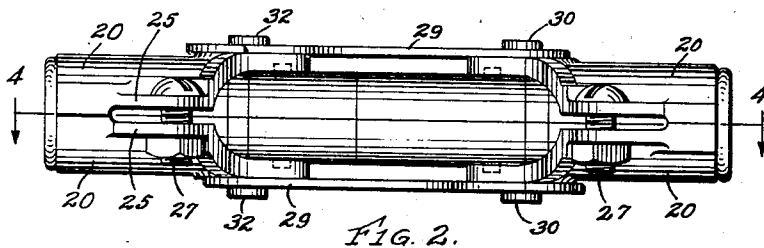


FIG. 2.

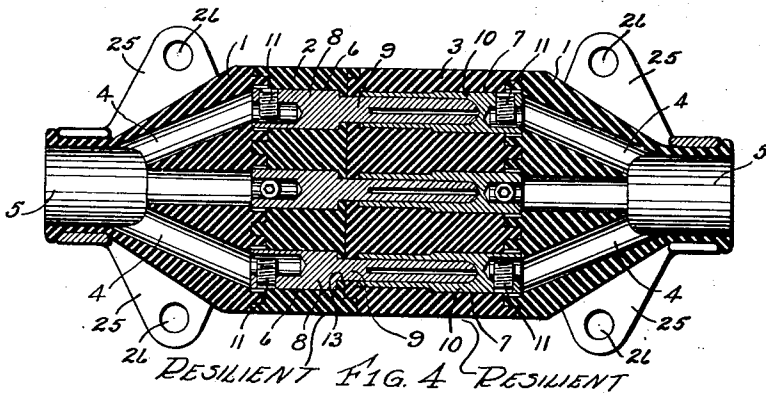


FIG. 4

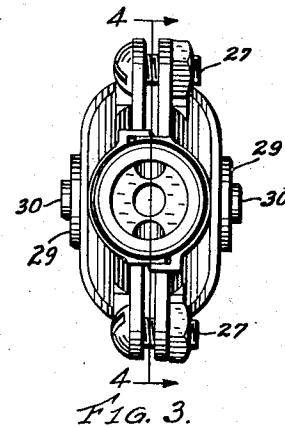


FIG. 3.

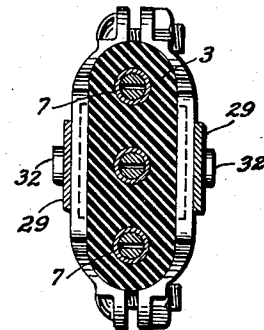


FIG. 5.

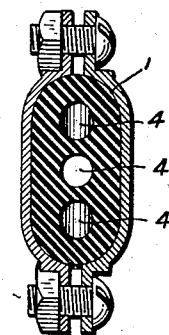


FIG. 6.

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2 Sheets-Sheet 2

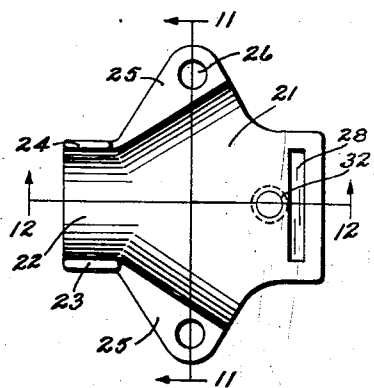


FIG. 10.

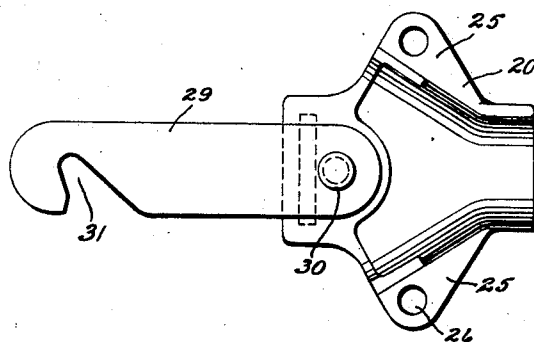


FIG. 13.

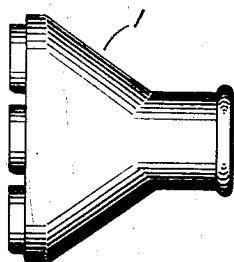


FIG. 7.

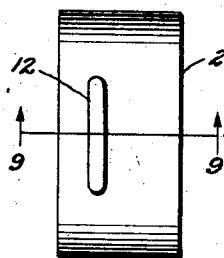


FIG. 8.

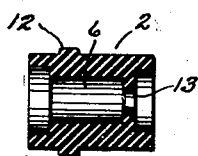


FIG. 9.

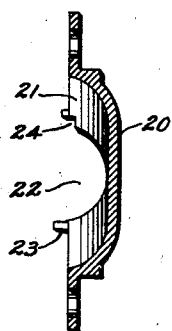


FIG. 11

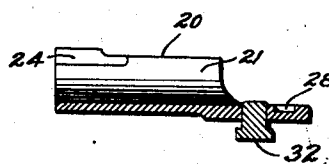


FIG. 12.

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UNITED STATES PATENT OFFICE

2,291,793

ELECTRIC CONNECTOR

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Application August 2, 1941, Serial No. 405,185

5 Claims. (Cl. 173—328)

My invention relates to electric connectors for the purpose of connecting the ends of one or more conductors.

One object of my invention is to provide a connector of the type shown and described and which is made of a resilient, tough and yieldable material which will withstand hard usage as, for instance, dragging over the floor of a mine.

Another object is to provide the connector with means to hold the parts in coupled relation and prevent the connector pulling apart and breaking the circuit when the connector is dragged over a rough floor if it should catch on a rail or other obstructions usually found in mines.

My invention resides in the new and novel construction, combination and relation of various parts hereinafter described and shown in the drawings accompanying this specification.

In the drawings:

Fig. 1 is a face view of my complete invention shown with all parts in coupled relation.

Fig. 2 is a side view of Fig. 1.

Fig. 3 is an end view of Fig. 1.

Fig. 4 is a longitudinal sectional view on the line 4—4 of Figs. 2 and 3.

Fig. 5 is a transverse section on the line 5—5 of Fig. 1.

Fig. 6 is a transverse section on line 6—6 of Fig. 1.

Fig. 7 is a face view of the resilient end member of my invention, similar members being used at both ends.

Fig. 8 is a member forming a portion of the left-hand part (A) of my invention.

Fig. 9 is a section on line 9—9 of Fig. 8.

Fig. 10 is an inner view of one member of the holding member I employ to hold the connector parts in coupled relation.

Fig. 11 is a sectional view on line 11—11 of Fig. 10.

Fig. 12 is a sectional view on line 12—12 of Fig. 10.

Fig. 13 is an outer face view of one end assembly of the holding mechanism I employ to hold the connector parts (A—B) in coupled relation.

The preferred construction of my invention comprises a pair of parts (A—B).

The parts A and B each comprise an end member which is made preferably of a resilient yielding material such as rubber or the equivalent.

The part A comprises an auxiliary member 2 of the same material as member 1 and the part B is provided with the auxiliary member 3 of

like material and quite similar in shape and purpose to that of the member 2.

The members 1 each have one or more passages 4 converging into one passage 5.

The members 1, 2 and 3 are provided with projections and intersections which tend to hold the members in position laterally and to resist the entrance of moisture forming what might be termed a "lapped joint."

The members 1 and 2 and, also, 1 and 3 are separately formed and may be separated longitudinally.

The members 2 and 3 have passages 6 and 7 respectively corresponding to the passages in the members 1.

In the passages 6 are loosely mounted plug contacts 8 having a projecting portion 9, and in the passages 7 are loosely mounted receiving contacts 10 into which project the portion 9 of the contacts 8.

The portion 9 of the contacts 8 is split to provide a spring engagement between the contacts 8 and 10 and the cable end of each contact is provided with an orifice or cavity to receive the end of the conductor to be held in place by screws 11 or other means.

To hold the parts 1, 2 and 3 in an assembled condition and the joints therebetween in tight engagement, I use a metal frame comprising a pair of two-part sockets to receive the end members and a pair of latch members to hold the sockets in predetermined relation.

Each socket comprises a pair of members 20 which are alike and formed with a recess 21 shaped to conform to that of the member 1. The two recesses 21 form a receptacle for the member 1 when the two members 20, forming a socket, are assembled.

The cable end of each socket is provided with a passage 22 to fit around the neck of the member 1 and each member 20 is provided with projections 23 and intersections 24 to better align the members and to form a complete support to fit about the yieldable neck to support the same.

Each member 20 is provided with wings or lugs 25 having openings 26 to receive the screws and bolts 27 to hold the members 20 in clamping relation relative to the members 1 and 2 and, also, 1 and 3.

Each member 2 and 3 is provided with an elongated lug 12 and each member 20 is provided with an elongated depression 28 which receives the lug 12 and when the members 20 are drawn together they hold the members 1 and 2, and, also, 1 and 3 in tightly coupled relation

with the joints therebetween held tightly closed.

The members 20 hold the members of the part A together as a unit and hold the members of part B together as a unit so that when the parts A and B are disconnected there will be only two parts to be manipulated by the operator.

In order to hold the parts A and B in connected or coupled relation with the outer faces of the parts 2 and 3 in secure abutting relation, I provide one socket, for instance D with latch members 29 which are pivotally attached to the members 20 by the rivets 30. If desired a single latch 29 may be attached to each socket C and D.

Each latch is provided with a slot or side opening 31 which is arranged to engage the rivet 32 on the other socket as, for instance, C. The slot 31 is slightly under cut requiring the resilient parts to be slightly compressed or bent laterally out of axial alignment in order to permit the latches 29 to interlock with the rivets 32 and this is possible since the members 1, 2 and 3 are of yieldable material. During the coupling and uncoupling operation the resilient parts A and B are compressed beyond that in effect after the parts are fully coupled due to the aforesaid under-cut.

The members 1, 2 and 3 being yieldable and the slot 31 slightly under cut requiring the compressing or the bending laterally of the members to lock the parts together provides a constant pressure holding the members 1, 2 and 3 in close engagement under slight compression when coupled.

In order to connect my invention to the conductors to be connected, the members are disassembled as, for instance, by bending the connector sideways slightly and unhooking the latch 28 on the concave side of the connector and then bending the connector in the opposite direction and unhooking the other latch. This permits separating the part A from the part B.

Next the members 20 of the sockets C and D are removed by removing the screws 27, thus permitting the members 1 and 2 and, also, the members 1 and 3 to be separated.

The contacts 8 and 10 are now removed endwise which is easily accomplished since the contacts are loosely mounted in the members 2 and 3.

The cable with its conductors properly prepared is now passed through the passage 5 and the conductors through the passages 4 and projecting sufficiently to enter the openings in the ends of the contacts 8 and 10 and the screws 11 are then manipulated to hold the conductors in place.

The contacts 8 and 10 are now replaced in their original position in the members 2 and 3 by returning the members 2 and 3 to their original positions relative to the members 1 with the contacts 8 projecting from the member 2 and the contacts 10 concealed within the member 3. The member 8 will engage the stop flange 13 and the member 10 will engage a similar flange on the member 3.

The sockets C and D are now replaced by reversing the operation of removing them and the parts A and B are moved into coupled position.

The latches 29 are interlocked with the rivets 2 by a slight bending of the parts previously described.

Having disclosed my invention, I wish to be limited only by my claims.

I claim:

1. An electric connector comprising a socket

member and a plug member, each member comprising a pair of insulating blocks of resilient, yieldable material, said members having metallic contacts and means for attachment of cables thereto, each member provided with a two-part metallic casing interlocked with one block thereof whereby both blocks are held in fixed relation to each other and to the casing, one block of each member arranged to project beyond the metallic casing whereby the faces of both projecting blocks abut and the blocks compressed when forced together, a pair of separately formed independently acting non-extensible means hinged to the casings to pivot on an axis transverse to the longitudinal axis of the connector and each means having latching means comprising a slot obliquely disposed to the longitudinal axis of the said means to interlock with a projecting latching means on the other casing to hold the socket and plug members in connected relation with the faces of the projecting blocks in contact, and the blocks under compression, the said slot being so constructed and arranged relative to the projecting latching means that the said projecting blocks must be further compressed before the interlock between the locking means may be broken.

2. An electric connector comprising a plug member and a socket member, each formed of a resilient, yielding material and having metallic contacts for electrically connecting the members, means on the metallic contacts to receive conductors, a metallic frame for holding the members in connected relation with abutting faces under a predetermined compression, the frame provided with a metallic socket for each member, a pair of separately formed, independently acting non-extensible means attached to the metallic sockets and each means having a slot to interlock with projecting latching means associated with the other metallic socket, the said members each projecting outwardly from its socket, the faces of the said members arranged to abut before the latching means can be fully interlocked thereby requiring the yielding members to be compressed in order to interlock the latching means, the members remaining under the said predetermined compression while the latching means are interlocked and the members requiring further compression by bending the plug and socket members, together with the metallic frame out of longitudinal alignment in order to break the interlock between the latching means.

3. A metallic frame to hold the parts of an electric connector in connected relation against accidental separation comprising a spaced pair of two-part metallic members, each member forming a receptacle to receive the connector parts, means to clamp the parts of each member together on to its connector parts, a pair of elongated separately formed strap-like members pivotally attached to either of the two-part members, one strap-like member on each side of the frame to pivot about a transverse axis independent of the other member, latching means comprising a slot obliquely disposed to the longitudinal axis of the strap-like member associated with one end of each strap-like member, latching means on the other two-part member on each side of the frame to interlock with the slotted latching means on the strap-like members whereby the two-part members are held in predetermined spaced relation, one of the latching means being so formed that the said predeter-

mined space between the two-part members must be reduced temporarily in order to lock or unlock the latching means.

4. A metal frame to hold parts of an electric connector in connected relation against accidental separation comprising, a spaced pair of two-part metal casings, each casing forming a receptacle to receive a connector part, means to hold the parts of each casing in an assembled relation, a pair of strap-like, separately formed and separately operating members, each member connected to a casing to pivot relative thereto about an axis at right angles to the longitudinal axis of the frame, projecting means on the other casing to cooperate with one of the strap-like members to hold the casing in predetermined connected relation, each strap-like member provided at one end with an open end slot to cooperate with one of the said projecting means whereby each strap-like member may be interlocked with its projecting means, and means associated with the slot to cooperate with the projecting means to prevent accidental disconnection of the strap-like members and their projecting means.

5. A connector for one or more conductors comprising a pair of connector-parts, each part comprising a two-member body of flexible and elastic insulating material in end butting relation and held against lateral movement by cooperating intersections and projections associated with the abutting faces of the members, one member of each part provided with one or more passages therethrough, one passage for each conductor to be connected and a contact positioned in each passage and arranged to butt against the

other member of said part to prevent longitudinal movement in one direction, each contact provided with means to receive a conductor, each contact of one connector-part interconnecting with a contact of the other connector-part to complete the electrical connection from one connector-part to the other connector-part, a two-part metallic casing for each connector-part and arranged to substantially enclose one member thereof and having means interlocking with means on the other associated member to hold the members of each part in assembled relation, locking means to hold and lock the connector-parts and the casings in coupled relation, the said means comprising, a pair of separately formed elongated non-extensible members attached to the casings and to pivot independently of each other about an axis at right angles to the longitudinal axis of the connector, the said elongated members being disposed in parallel planes, each parallel to the said longitudinal axis, each elongated member provided at one end with a side opening slot obliquely disposed to the longitudinal axis of the elongated member and provided with an under-cut, the said slot and under-cut arranged to receive a projecting member on the opposite casing whereby the said elongated members and the said projecting members cooperate to hold the connector-parts in coupled relation, the said slot and under-cut being so constructed and arranged as to require the connector-parts to be compressed when the faces meet and before the locking of the parts together may be effected.

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