J. LOFGREN.

ELECTRICAL CONNECTOR.

APPLICATION FILED SEPT. 29, 1917

1,304,075.

Patented May 20, 1919.

Fig. 1.

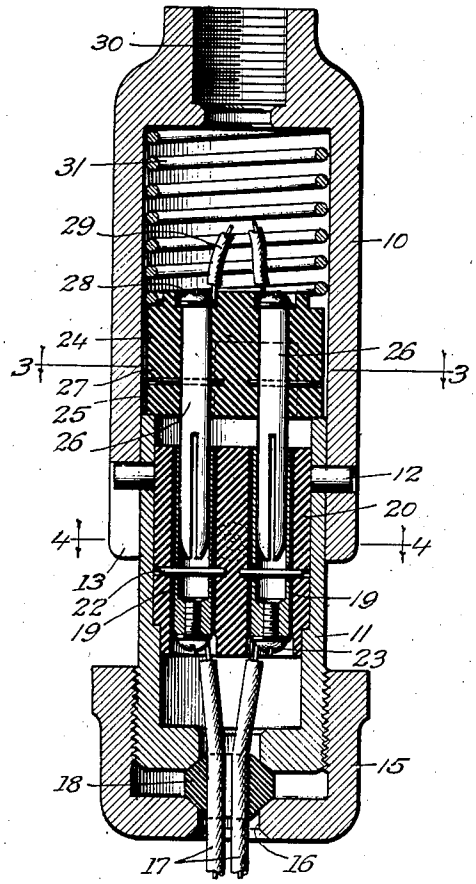


Fig. 2.

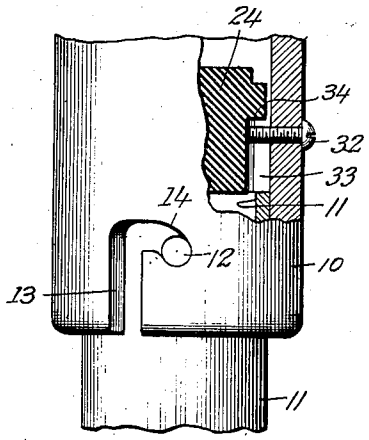


Fig. 3.

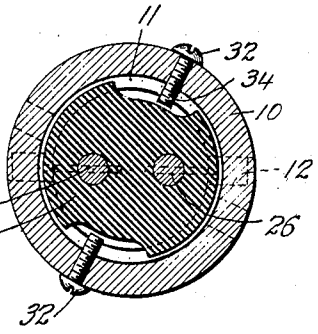
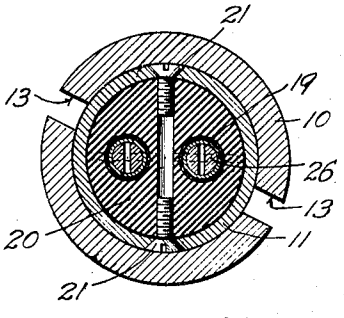


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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ELECTRICAL CONNECTOR.

1,304,075. Specification of Letters Patent. Patented May 20, 1919.

Application filed September 29, 1917. Serial No. 193,869.

To all whom it may concern:

Be it known that I, JOHN LOFGREN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Connectors, of which the following is a specification.

This invention relates to improvements in electrical connectors, and more particularly to connectors of the plural-contact type wherein the contacts are longitudinally movable into or out of engagement.

One of the objects of the invention is to provide a two-part separable connector carrying a plurality of longitudinal, slidably engaging contacts.

Another object of the invention is to provide such a connector in which the contacts are mounted to permit of a slight, floating movement, insuring free and easy alinement of the separable contact members.

A further object of the invention is to provide a sturdy, rugged construction particularly adapted for large, heavy service work.

Other and further objects will become apparent to those skilled in the art from a consideration of the following description and drawings wherein,

Figure 1 is a longitudinal sectional view of the improved connector with the contacts engaged.

Fig. 2 is a fragmentary side-elevation with parts broken away.

Fig. 3 is a transverse, section view on the line 3—3 of Fig. 1; and

Fig. 4 is a transverse, sectional view on the line 4—4 of Fig. 1.

In large, heavy connectors such, for example, as are used in locomotive work, a sturdy, rugged construction is essential. In small connectors the expense of accurately forming and fitting the insulating blocks upon which the contacts are mounted, within their shells, is a less important factor, than in the construction of large, heavy connectors where the expense of accurate workmanship very materially increases the cost of production.

In large sized connectors carrying a heavy current, end engaging contact pieces are unsatisfactory due to corrosion and burning, resulting from poor contact surfaces. I have therefore provided telescoping contact members carried in coöperating casing members. The connector members are spaced apart a considerable distance and it will be apparent that very careful, accurate workmanship and interfitting of parts, is essential to insure accurate alinement of the telescoping contact members such as is necessary if a smooth working device is to be produced.

It is to eliminate the necessity for accurate fitting and formation of the separable connector parts, and to thereby cheapen the expense of production and increase the ease of separation or connection, that I have loosely mounted one of the insulating block fittings within its incasing shell and loosely mounted the contact in the other insulating block, thus permitting a floating movement of the contacts allowing for such displacement as may be necessary to aline the interengaging parts.

As the connector shells are held in engagement by means of a bayonet lock, I have mounted one of the contact carrying insulating blocks to permit of limited rotative displacement with respect to its shell. This permits relative rotation, of the shell parts in locking or unlocking the bayonet joint while the contacts are in engagement.

Referring now to the specific apparatus illustrated for the purpose of making a full and complete disclosure of the invention, the numeral 10 indicates a socket shell within the outer end portion of which is telescopically fitted a similar shell 11. Shell 11 carries radially projecting pins 12 for engagement with the slots 13 in the shell 10, the slots 13 opening on an axial line to the end of the shell 10 and at their inner ends being offset as at 14 to provide the usual form of bayonet lock for holding the two parts in engagement.

A cap 15 is screw threaded over the outer end of the shell 11 having an opening 16 at its center to receive the current carrying wires 17. A rubber button 18 surrounds the wires and is squeezed between the end of the shell 11 and cap 15 to weatherproof the connection. The two tubular contact members 19 are positioned within spaced apart openings in an insulating block 20 securely held in position within the shell 11 by means of the screws 21 which extend

radially through the shell and into the block. The openings in which contacts 19 are positioned are formed with a diameter somewhat greater than the tubes to permit some slight sidewise movement of the tubes within the block, pins 22 extending through enlarged holes in the tubes serving to prevent the contacts from dropping out. At the outer end each contact carries a terminal screw 23 for connection with the ends of the wires 17.

In the shell 10 of the connector, I have positioned a second insulating block 24 which is of a diameter somewhat less than the inner diameter of the shell so as to leave a space 25 around the block to permit slight radial displacement or floating movement of the block with respect to its casing. The block 24 carries a pair of split contact members 26 which are spaced apart a distance approximately equal to the distance between the opposing contacts 19 and are securely held in place in the block by means of the pins 27. Contact screws 28 take into the outer ends of the contacts 26 for engagement with the wires 29 which extend through the opening 30 in the outer end of the shell 10.

A coil spring 31 positioned in the base of the shell 10 engages the rear end of the block 24 and tends to press the same outwardly toward the opposite connector. Outward movement of the plug under the influence of the spring is prevented beyond a certain point by means of the screws 32 which extend radially inwardly through the shell 10 into engagement with axially extending slots 33 formed at opposite sides of the wall of the block. These slots 33 terminate at their inner ends in the shoulders 34 which engage the screws 32. The slots are formed not only with an axial dimension but also extend in an arcuate form through an angle sufficient to permit the relative movement of the block with respect to its casing, when the bayonet lock formed by the slots 13 and pins 12, is engaged or released.

The outwardly extending ends of the split contacts 26 are tapered somewhat so as to insure their alinement with the coöperating, tubular contacts 19 when the two parts of the plug are brought together.

With the above construction, it will be apparent that the parts may be easily assembled without careful fitting and adjustment, and a smooth, easy engagement of the contact members will at all times be insured because of the freedom of the block 24 to float within its incasing shell 10 and the loose mounting of contacts 19 within their insulating block. It will also be evident that in a heavy, large-sized connector of this character, unnecessary wear and unevenness of action inherent in connectors wherein the contacts are held rigidly in position, will be eliminated. By permitting limited movement of the contact carrying members, free and easy working alinement of the sliding contact parts is insured.

Whereas I have illustrated and described but a single embodiment of my invention, it will be apparent to those skilled in the art that many changes and modifications may be made therein, without departing from the spirit of the invention or the scope of the appended claim.

Having described my invention, what I claim is:—

A two part separable connector comprising two interengaging members; one member providing a cylindrical shell open at one end; an insulating block having limited axial and rotatable movement therein; means to limit the axial and rotatable movement of said block; a spring in said shell to yieldingly hold the block near the open end of the shell; a pair of electric terminals carried by the block and movable therewith; in combination with another member providing a cylindrical shell telescopically engaging the shell of the first mentioned member; an insulating block fixed in the shell of the second mentioned member; a pair of electric terminals carried by the said block telescopically engaging the terminals of the first mentioned member and a coöperative bayonet joint to lock the members together.

In testimony whereof I hereunto set my hand.

JOHN LOFGREN.