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ELECTRIC PLUG AND SOCKET CONNECTION

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This invention relates to electric plug and socket connections, and more particularly to such connections, in which the socket is provided with a switch, and has for its object to provide improvements therein, whereby an increased degree of safety shall be provided, and whereby the construction and operation shall be greatly improved.

According to this invention in a switch of the kind referred to the switch operating arm projects from the front of the socket adjacent to a wall of the plug when in position, the wall of the plug and the switch arm being adapted to interlock in such a manner that the plug pins cannot be inserted in the socket until the switch is "off," and if withdrawn before the switch is "off" will itself cause the switch to go "off" before the pins can leave the socket.

The invention is more particularly set forth with reference to the accompanying drawings wherein—

Fig. 1 is a side elevation of a plug and socket according to the invention, with the switch "on." Fig. 2 is an underside plan. Fig. 3 is a side elevation showing the plug and socket separated. Fig. 4 is a view similar to Fig. 1 with the switch "off," and Fig. 5 is an elevation of the plug looking from the pin side.

As shown in the drawings, in which the invention is applied to a plug and socket member as used on a wall, the socket member 6 has a front plate, through an opening in which there projects a switch arm 7 operating a switch—not shown—and which arm swings in a plane at right angles to the plane of the front plate. The arm 7 is adjacent to the position which will be occupied by the side of the plug 8 when it is in place, with its pins 9 in the socket, and this arm has on its side a stop or projection 10, projecting inwardly and into the area occupied, or to be occupied by the plug 8.

The plug side, in order to accommodate this stop or projection 10, is grooved or slotted as at 11 so that when the plug is in the socket the switch arm can be put "on," to effect this it is clear that the groove 11 must be within the radius of movement of the switch arm 7 and consequently the switch arm can only be moved "on" when the plug 8 is either not in the socket 6 at all or is fully home in the socket.

If the switch arm 7 be "on" as in the dotted position in Fig. 3 when the plug is out of the socket, and an attempt be made to insert the plug, the stop or projection 10 on the switch arm 7 will prevent the insertion of the plug as it will not be in line with the slot 11, so that it must be switched "off," into the position shown in full lines in Fig. 3, before the plug can be inserted.

Once the plug is in, and properly home, as shown in Fig. 4, the switch arm can be turned to the "on" or "off" position, the slot 11 already referred to permitting this.

In order to accommodate the stop or projection 10 the side of the plug 8 may be grooved, with the bottom edge or face of the groove curved, or inclined downward or alternatively and as shown in the drawings, a projection 12 may be on the side of the plug and the top face 13 of this projection, which is the equivalent of the bottom edge of a groove, is inclined toward the gap 11 so that the arm 7 can be put "on" with the projection 10 resting on the inclined face 13.

Consequently, if the plug be pulled out when the switch is "on" the arm 7 must be pushed over to the "off" position, so that the projection 10 will align with the slot 11 and this will ensure that the circuit is broken before the plug can be withdrawn sufficiently to break the circuit, thus it follows that the switch will always be "off" and the circuit open before the plug can be withdrawn, and also it must always be "off" before the plug can be inserted, otherwise the bottom of the plug or the projection 12 will be held by the projection 10.

It will be seen that by this invention no alteration is required to the pins in the plug, which can be of any type required, and there is thus no strain on the pins greater than the usual strain in inserting and removing a plug, and while it is preferable to switch off before removing the plug, if this be overlooked, the plug can still be withdrawn without injury, as the extra pull is taken by the casing or wall of the plug which is amply strong to withstand the strain to which it may be put.

While the invention is described herein as applied to a wall socket, it is to be understood that it may be used in any other desired position, such as on a floor or bench.

What I claim as my invention and desire to secure by Letters Patent is:

1. An electric connector comprising a plug member provided with projecting pins, a socket member having sockets for the reception of said pins, a shiftable switch arm carried by said socket member and projecting from the front thereof toward said plug member, said switch arm being manually operable to shift the same
into "on" position after engagement of the plug and socket members, and cooperating means carried by said switch arm and plug member for automatically shifting the arm to "off" position during disengagement of the plug member from the socket member, said cooperating means being effective also to prevent engagement of the plug and socket members when the arm is in "on" position.

2. An electric connector as set forth in claim 1, said cooperating means comprising: a projection extending laterally from said switch arm near its free end and said plug member having a slot in one face thereof for accommodating said switch arm in its "off" position, and an obstruction in said slot disposed in position to engage said projection and prevent engagement of the plug and socket members when the switch arm is in "on" position.

3. An electric connector as set forth in claim 1, said cooperating means comprising a projection extending laterally from said switch arm near its free end and said plug member having a slot in one face thereof for accommodating said switch arm in its "off" position, and a cam-formed obstruction in said slot disposed in position to engage said projection and prevent engagement of the plug and socket members when the switch arm is in "on" position, said obstruction being effective to shift said arm to "off" position during disengagement of the plug and socket members.

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