

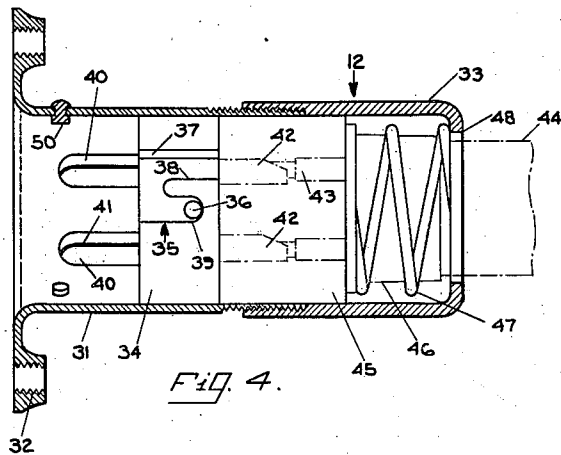
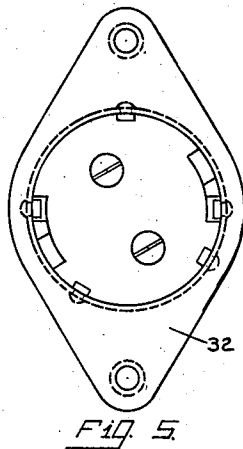
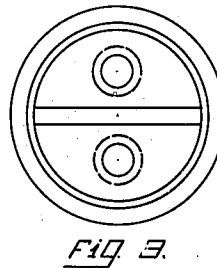
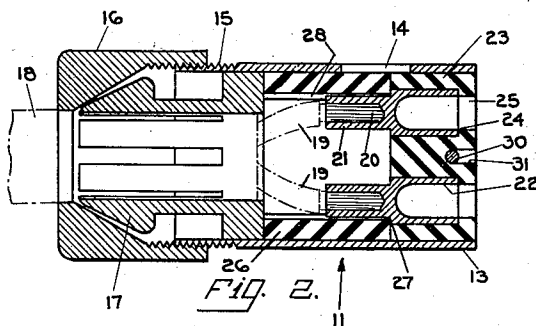
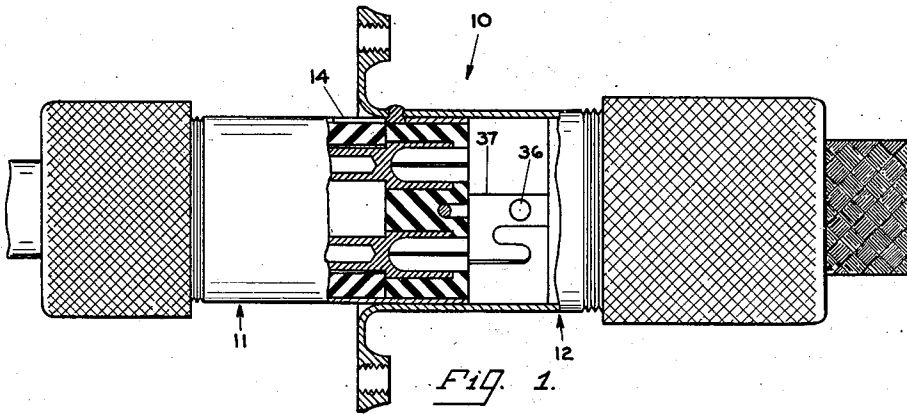
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PLUG AND RECEPTACLE

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PLUG AND RECEPTACLE

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1 Claim. (Cl. 173—328)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to a double contact electrical receptacle and plug especially intended for use on aircraft, and more particularly on aircraft instrument boards, wherein the instrument board may be provided with receptacles of this invention, and the plug of this invention may be connected thereto at desired times for affording a power circuit to the wires connected to the receptacle. There are some instruments on aircraft, particularly military aircraft of the bombing type, which are actuable by electrical circuits, but where, as a safety precaution, it is desirable that the power to such instruments be entirely disconnected when early use of such instruments, such as operating bomb dropping traps, is not contemplated. With this invention it becomes possible to sever the power connection from the source of current to the instrument and thus avoid relying upon an ordinary switch which might accidentally complete the circuit to cause an undesired operation.

A further object of this invention is to provide a receptacle including male contacts and a plug including female contacts, and to provide means whereby the female contacts of the plug will be double locked to the male contacts of the receptacle, preventing accidental separation thereof.

With the foregoing and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter described and illustrated in the drawing, in which,

Fig. 1 is an elevational view, partly in section, of the plug and receptacle in interlocked relation.

Fig. 2 is a sectional view of the plug assembly.

Fig. 3 is an end view looking at the left of Fig. 2.

Fig. 4 is a partly sectional and partly elevational view of the receptacle assembly; and

Fig. 5 is an end view looking at the right of Fig. 4.

There is shown at 10 the interlocking plug assembly 11 and receptacle assembly 12 constituting this invention.

The plug assembly 11 consists of a housing 13 provided with appropriate bayonet slots 14 for holding it in assembled relation with the receptacle 12. One end of the housing 13 is threaded as at 15 to receive a cap 16 which holds a gland 17 pressed about a conduit 18, through which extends conductors 19 whose ends 20 are soldered into hollow pins 21 which integrally extend from the backs of female contacts 22. These female contacts 22 are placed through apertures in an insulating spacer 23 and abut against the flanges 24 at the ends of apertures 25. The female contacts 22 are held in the spacer 23 by an insulat-

ing sleeve 26 which abuts against the shoulder 27 formed between the pins 21 and the backs of the female contacts 22, sleeve 26 being provided with recess 28 to align with the outside of the pins 21, the spacer 23 being held within the end of the housing 13 by a cross-bar 30 in a suitably positioned recess 31 extending across the end of the spacer 23.

The receptacle assembly 12 includes a housing 31 having a flange 32, whereby it may be suitably secured as to an instrument board. A cap 33 serves for holding the receptacle assembly in assembled position. Within the housing 31 there is placed an insulating plug member 34 in the shape of a cylindrical disc, but having bayonet slots 35 on opposite sides thereof cooperating with bayonet pins secured through the housing 31. The bayonet slots 35 have one side wall 37 extending in a straight line the full thickness of the cylindrical disc 34, while the other wall 38 is S shaped, and thus extending partly through the cylindrical disc, thereby providing a bayonet pin receiving recess 39.

Extending into this insulating plug member 34 are a pair of male finger contacts 40 which are split as at 41, so as to make them slightly yieldable and permit them to be inserted into the female contacts 22 of the plug assembly 11.

The male contacts 40 terminate on the other side of the male plug member 34 in hollow ends 42, within which may be soldered the conduit wires 43 extending from the conduit cable 44. An insulating spaced sleeve 45, identical with the sleeve 26, is placed about the hollowed ends 42 between the insulating plug member 34, and a shouldered insulating ferrule 46 is placed within the cap 33 about the end of the cable 44, the shouldered ferrule 46 being urged by the spring 47 against the sleeve 45, spring 47 abutting against an intumed flange 48 of the cap 33.

In operation, the plug assembly 11 and the receptacle assembly 12 are each assembled as shown in Figs. 2 and 4, with the bayonet slot 35 of the insulating plug member 34 in the position shown in Fig. 4, having the bayonet pin 36 located within the recess 39, being urged into such position by the spring 47. When inserting the plug assembly 11 into the receptacle assembly 12, the female contacts 22 and insulating apertures 25 will pass over the male finger contacts 40. The plug housing 13 enters within the receptacle housing 31, while the bayonet slots 14 line up over the bayonet pins 50, of the receptacle housing. After the plug 11 is inserted into the receptacle 12

it is rotated to bring the pins 50 into locked position within the bayonet slots 14.

Simultaneously with this insertion and rotating movement the insulating plug member 34 will, with sleeve 45, move against spring 47, thereby permitting the plug assembly 11 to enter a sufficient distance. Then when the plug 11 is rotated to lock the bayonet slots 14 on the pins 50, the pin 36 will be removed from the recess 39 of bayonet slot 35 in receptacle plug member 34 to a position adjacent the bayonet slot wall 37, as shown in Fig. 1, so that when the plug 11 is locked within the receptacle 12 the receptacle plug member 34 is released from the bayonet pin 36 and its male finger contacts 40 yieldably urged into the female contacts 22 to a tight contact. On disconnecting the plug 11 from the receptacle 12, the plug 11 is first pushed, rotated, and then withdrawn, which movements will again bring the pin 36 back into the bayonet slot recess 39 and thus hold the receptacle plug member 34 and its finger contacts safely within the housing 31.

Inasmuch as cable 18 and the plug assembly 11 is connected to the source of electrical current the cable 44 of receptacle assembly 12 is connected to the instrument to be operated, it is obvious that there may be no circuit to the cable 44, unless and until the female contacts 22 have been brought into position about the male finger contacts 40. Furthermore, it will be observed that the contacts in both the plug and the receptacle are located a substantial distance within the ends thereof, thereby eliminating possibility of short circuits therethrough.

Other modifications and changes in the proportions and arrangements of the parts may be made by those skilled in the art without departing from the nature of the invention, within the scope of what is hereinafter claimed.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

In combination, an electric plug and a receptacle, said plug including female contact means and said receptacle including male contact means, means unrestrictedly yieldably urging the male contact means of the receptacle into the female contact means of the plug when the plug is in contact with the receptacle, and means restricting the movement of the male contact means in the receptacle when the plug is not in contact therewith, said last mentioned means including an insulating plug member through which said male contact means is mounted, a cooperating bayonet slot means on the side of said insulating plug member and pin means on said receptacle, said bayonet slot means having a shoulder in said insulating plug member cooperating with said pin means to limit the longitudinal movement of said insulating plug member in one position thereof and having a through slot therein to free the said insulating plug member for unrestricted yieldable movement in another position thereof, and cooperating bayonet pin and slot means in said plug and said receptacle, whereby when said plug and receptacle are relatively rotated when brought into contact, the insulating plug member is rotated to the position of unrestricted yieldable movement to press the male contact means into the female contact means.

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