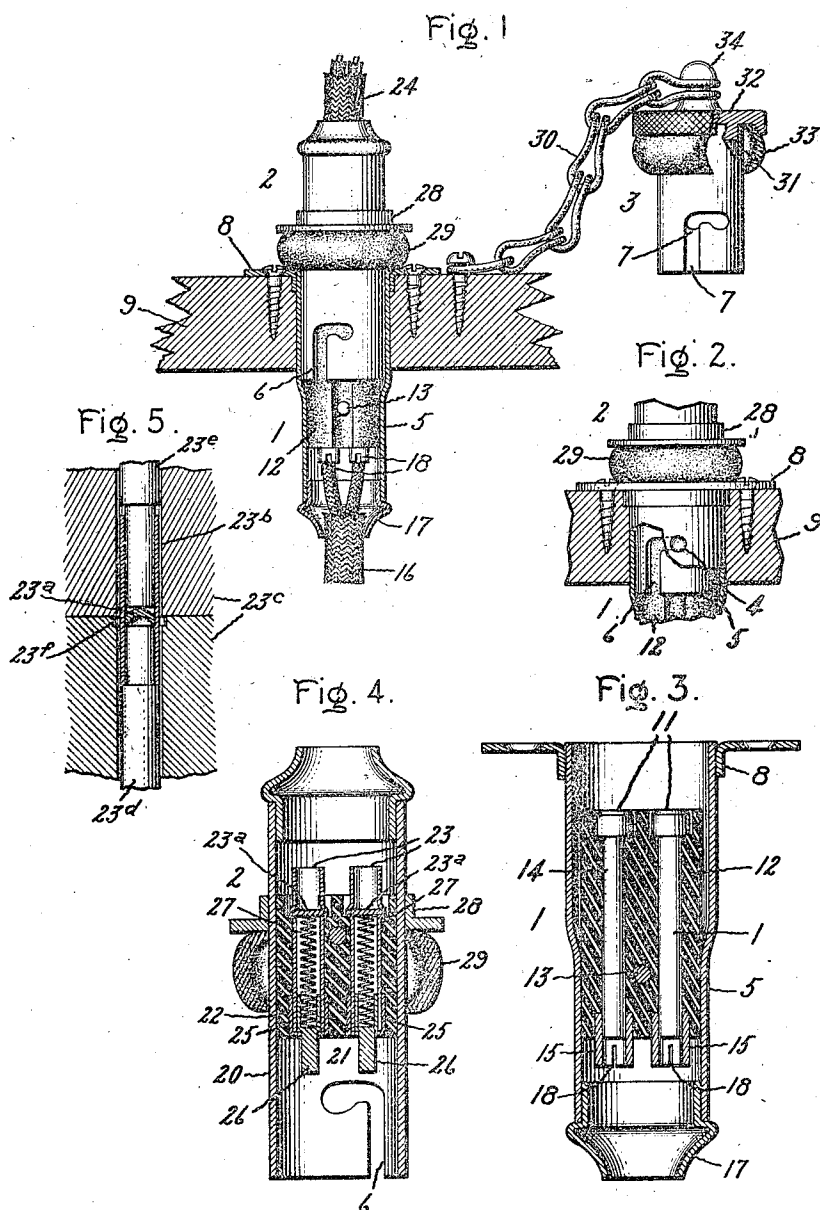


G. WRIGHT.
 SOCKET AND PLUG DEVICE.
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1,271,981.

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Witnesses:

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UNITED STATES PATENT OFFICE.

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SOCKET AND PLUG DEVICE.

1,271,981.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GILBERT WRIGHT, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Socket and Plug Devices, of which the following is a specification.

My invention relates to socket and plug devices for the making of electric circuit connections. It is my aim that the interior of the receptacle or socket should have watertight protection both when the connection plug is in it and when it is not, so that it shall be suitable for use on motor boats and in other situations where special protection from water or moisture is desirable. I also aim to make the device and its parts simple and rugged in construction, easy and cheap to manufacture, and reliable and convenient in use. The invention comprises various novel features of construction and various novel combinations and arrangements of parts that will be hereinafter set forth by the illustration and description of the best form of apparatus embodying them at present known to me, and will also be definitely pointed out and distinguished in my claims; but, while the invention extends to specific features and details of the devices shown and described, it is not confined thereto. The invention also comprises a novel method for the manufacture of one of the parts.

In the accompanying drawings, Figure 1 shows the socket device, partly in section, secured in the deck of a motor boat or the like; it also shows two plug devices, one of them in place in the socket, and the other partly in section.

Fig. 2 is a fragmentary detail view, only partly in section, illustrating a feature of the socket device in front of the plane of section of Fig. 1.

Figs. 3 and 4 are enlarged sectional views of the socket device and of the plug device that is in place in it in Fig. 1, respectively.

Fig. 5 is a fragmentary detail view illustrating the making of one of the parts.

From Figs. 1 and 2 it will be seen that the socket device 1 and the plug devices 2 and 3 are of the "bayonet" type, the engagement means associated with the socket having the

form of bayonet pins or studs 4 extending inward from its shell or wall 5, and that associated with the plug being the usual bayonet slots 6 or 7. It will also be seen that there is a flanged collar 8 soldered or otherwise secured to the shell 5 of the socket device 1, and that the screws by which the socket device is secured in its hole in the deck planking 9 extend through holes in this collar. From Figs. 1 and 3 it will be seen that besides the engagement means 4 for securing a plug device in it, the socket device 1 comprises duplicate contact or engagement means 11, 11 for making electrical connection with a connective plug device, said engagement means 11, 11 being mounted in a cylindrical insulating part 12 which is secured in the shell 5 by a transverse screw, bolt, or pin 13. Each of the contact members 11 comprises a bolt-like part 14 whose head is exposed in a recess in the end of the part 12 adjacent the mouth of the socket and whose shank extends through said part 12 and has on it a short ferrule or tube 15. The waterproof cord or cable 16 extends through an opening in the cap 17 at the lower end of the shell 5, and its two conductors are soldered fast (before the part 12 is fastened in place by the pin 13) in the ferrules 15, each of which has diametrically opposite slots 18 to facilitate soldering with minimum removal of the insulation. The entrance of the cable 16 into the cap 17 can, if desired, be made water-tight by any suitable packing or other waterproof material in the lower end of the shell 5; such material is not shown in the drawing to avoid confusion.

Referring, now, to Figs. 1 and 4, it will be seen that the body of the connection plug device 2 shown in place in the socket 1 in Fig. 1 is adapted to enter the upper end of the socket device 1 in such wise that its bayonet slot engagement means 6 shall "take" the studs 4 of the latter in very much the usual way, the upper end of the shell 5 being slightly larger than the insulating part 12 so as to allow space around the latter for the shell 20 of said plug device. It will further be seen that besides the engagement means 6 for securing it in the socket 1, the plug device 2 carries duplicate yielding engagement or contact means 21 for coacting with

the contact means 11, 11 of the socket device 1, the contact means 21, 21 being mounted in an insulating part 22 that resembles the part 12 and is secured in the shell 20 in a similar way. Each of the contact elements 21 comprises a double-ended hollow body part 23 in whose upper end one of the conductors of the flexible waterproof cable 24 is soldered; a cap 25 on the lower end of the part 23; a shouldered contact member proper 26 the small end of which extends out through a hole in the cap 25; and a spiral spring 27 arranged in the lower portion of the part 23 with its lower end in a recess in the enlarged upper end of the contact member 26. The hollow in the upper end of each part 23 is separated from the spring chamber in the lower portion thereof by a septum consisting of a metal disk 23^a whose edges are held in an annular groove in the wall of the part 23. As will be seen from Fig. 5, the part 23 can be easily formed by inserting the plain tubular shell 23^b in a two-part die 23^c with a stationary member 23^d extending upward in the tube about to the division between the parts of the die, placing the disk 23^a in the tube on top of the member 23^d, cupped or concaved, so that although when flat it will be larger than the interior of the tube it will nevertheless easily enter the same,—and finally forcing a movable member 23^e down on the disk until it is flattened out, its expanding edges locally expanding the wall of the tube out into an annular groove 23^f in the die at the junction of its halves in the form of a hollow bead whose groove contains the edge of the disk and the subsequent raising of the upper part of the die permitting removal of the completed part 23. A flanged collar 28 is soldered or otherwise secured on the shell 20, and yielding packing means 29 extends around the device 2 beneath the abutment or shoulder formed by the flange 28; this packing may advantageously be an india-rubber ring having the form and crescent-shaped cross-section shown in the various figures. The relative arrangement of the various parts is such that when the plug device 2 is secured in place in the socket 1 a good electrical connection will be formed, and the packing means 29 will be compressed water-tight between the abutment or shoulder formed by the flange 28 and that formed by the flange 8.

As it will ordinarily be just as important to keep water or moisture out of the socket 1 when the connective plug device 2 is not in it as when it is in it, I prefer to provide the stopper plug device 3 for this purpose, securing it to the deck 9 beside the socket 1 by a screw and a chain 30. As shown, the body portion of this device which has the bayonet slots 7 (similar to the slots 6 of the connective

plug device 2) is a cylindrical shell 31 soldered or otherwise secured to the inner wall of a groove in an end part 32. The recessed flange at the edge of the end part 32 thus forms a shoulder or abutment corresponding to that formed by the flanged collar 28, and beneath this abutment is yielding packing means 33 shown as exactly like the packing means 29 of the connective plug device 2. The upper side of the end part 32 has a stud 34 to which the chain 30 is secured, and its edge is knurled to give a good hold for manipulating it.

It will be seen that all the parts of the devices described can easily be made of brass or other metal or of fiber or other insulating material and that with the flanged collars 8 and 28, the stopper plug device 3, and the chain 30 omitted, these devices can be used as ordinary sockets and connective devices not intended to be water-tight, so that the complete water-tight equipment can be made up as called for from ready manufactured ordinary stock parts supplemented by a minimum of special parts,—and when it is not deemed necessary for the securing of the socket device 1 in place the flanged collar 8 can be omitted and the deck of the like made to serve as the abutment means of said device, thus even reducing the number of special parts required.

While I have referred to the device 1 as a "socket" and the device 2 as a "plug," this terminology is a matter of convenient distinction between the fixed and detachable parts, rather than a differentiation of their capabilities due to structural differences; indeed, the bayonet slots 6 and yielding contacts 21 of the device 2 adapt it for use as a socket and would ordinarily cause it to be classed as such. However, while it is not necessary to make the part which the other enters the fixed one, or, when engagement means of the bayonet type are used, to have the bayonet slot in the detachable part (as shown), yet it is practically simple and advantageous to do so.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A connective plug device for a bayonet socket comprising a hollow body adapted to enter therein having bayonet engagement means adapted to coact with that of the socket and an external shoulder; yielding contact means in said body each comprising a shell with a partition therein consisting of a metal disk held at its edges in a groove in the wall of the shell, a movable contact member in one end of said shell, and a spring in said shell between said member and said partition; and an elastic ring on said body adapted to be compressed water-tight between said flange and abutment means associated with the socket.

2. A double ended hollow body part for a

yielding contact element comprising a one piece tubular shell with a partition therein consisting of a metal disk of larger size than the interior of said shell held at its edge in
5 a groove in the wall of the shell.

3. A double ended hollow body part for a yielding contact element comprising a tubular shell with a partition therein consisting of a metal disk of larger size than the inte-

rior of said shell held at its edge in a groove 10 or bead-like local expansion of the shell.

In witness whereof, I have hereunto set my hand this 10th day of March, 1914.

GILBERT WRIGHT.

Witnesses:

BENJAMIN B. HULL,
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