Dec. 10, 1929. H. B. JONES 1,738,710

METHOD FOR IDENTIFYING CABLED WIRES

Filed Feb. 21, 1925

Fig. 1.

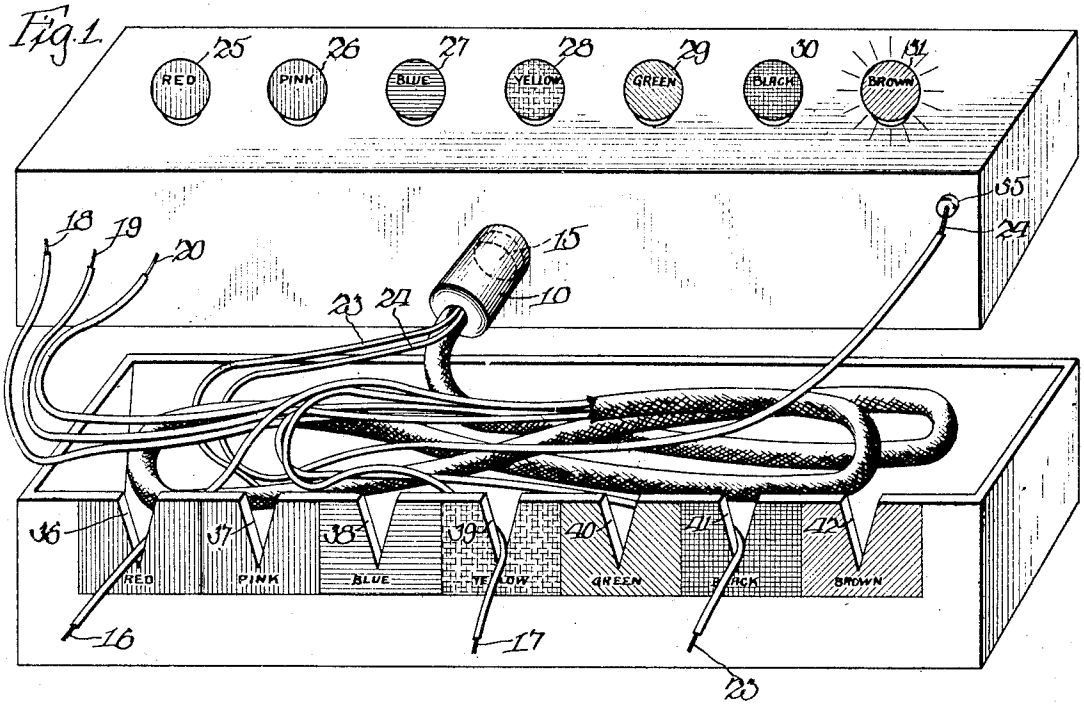


Fig. 2.

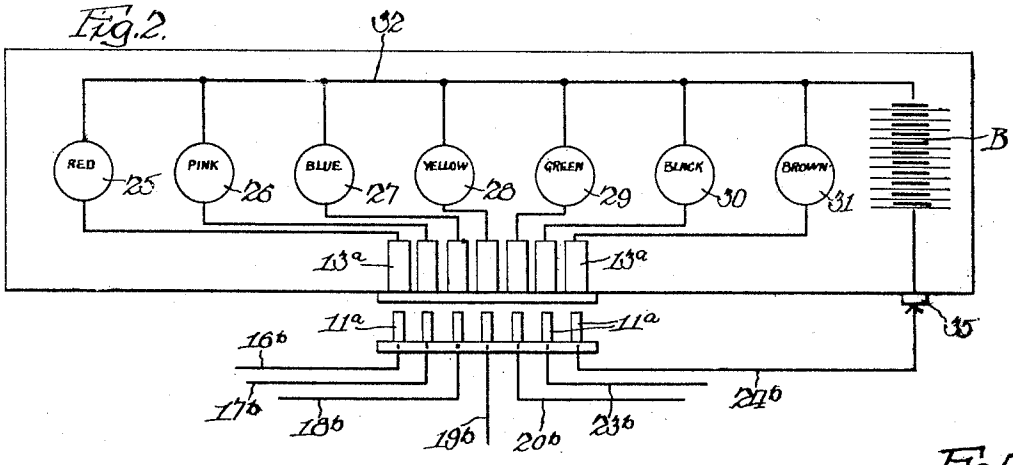


Fig. 3.

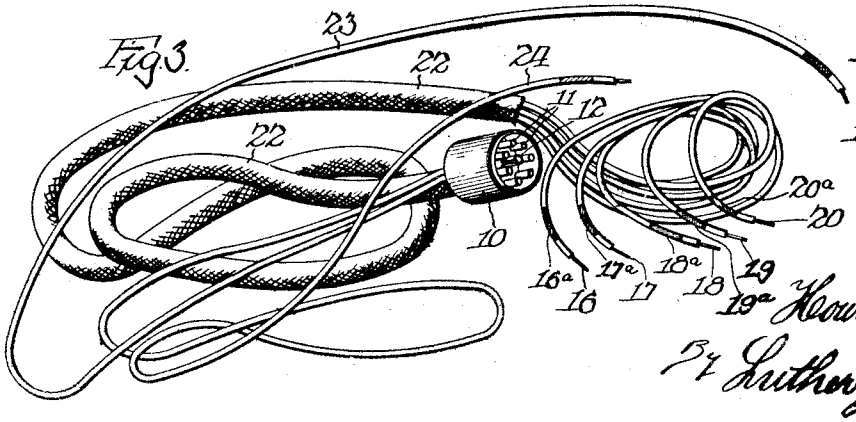
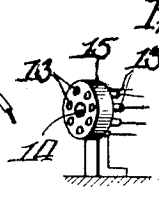


Fig. 4.



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Patented Dec. 10, 1929 1,738,710

UNITED STATES PATENT OFFICE

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METHOD FOR IDENTIFYING CABLED WIRES

Application filed February 21, 1925. Serial No. 10,738.

In my specific practice the invention relates to the identification of cabled wires attached to the terminals of a multiple connection device, and the object is to provide simple and efficient methods and means for the purpose. Other objects and advantages will appear hereinafter.

In the drawings Figure 1 shows a simple and preferred form of means with which my new method may be practiced; Fig. 2 is a diagrammatic view illustrating the circuits and other details understood to be present in the testing device of Fig. 1; Fig. 3 is a view of a flexible connection unit comprising five wires in a cable, two outside wires, and a multiple connection plug at one end; and Fig. 4 is a perspective of a socket element with which the plug element of Fig. 3 may be used.

In Fig. 3 the multiple connection plug device 10 has seven contact stems 11 arranged in a circle about a guiding stem 12, these contact stems being adapted to interfit respectively with tubular contact members 13 of the socket member of Fig. 4 while the central stem 12 of the plug passes into the central opening 14 thereof, the shell of plug element 10 telescoping upon the cylindrical part 15 of the socket member. Each of the socket elements 13 projects beyond the member 15 and lead wires are soldered to them respectively, the seven lead wires, in my practice, leading to given terminals in a radio receiving set. The socket member of Fig. 4 may be considered as being mounted within the cabinet of such a set with a hole in the side wall of the cabinet for the admission of the plug member 10. The terminals in a receiving set to which the lead wires of the socket member of Fig. 4 are also connected are ordinarily established in the set for the antenna, the ground, plus A battery, plus B battery amplifier, plus B battery detector, minus B battery, and minus A battery; but these terminals are mentioned in merely a suggestive way as some sets may call for other terminals and the progress of the art may develop others at the present time unknown.

Fig. 3 shows five wires 16, 17, 18, 19 and 20, issuing from rubber-coated insulation 16^a, 17^a, 18^a, 19^a and 20^a respectively, and these five rubber-coated wires are shown as being encased in an envelope 22 putting them in the form of a cable except for their free end portions, say for a distance of about a foot and a half. The entire length of these wires in my practice varies from about five to eight feet. Two other insulated wires, 23 and 24, are shown as being outside of the cable, and these are to be understood as being connections for the antenna and ground, and are separated from the cable wires, for one reason, to prevent inductive interference with the antenna circuit when the device is in use.

The seven wires of Fig. 3 are to be understood as being connected to the seven plugs 11 respectively within the tubular housing of the plug member 10. Details of such a plug member 10 and of the essential features, for present purposes, of the socket member of Fig. 4 will be found disclosed in my copending applications Serial No. 584,901, filed August 28th, 1922, and Serial No. 622,241, filed March 2nd, 1923, on electrical connection devices, and in these disclosures it will also appear that the seven wires are strongly bound to the socket member 10 within the housing thereof.

It is desirable for various reasons that the wires issuing from the plug member 10 be in the form of a cable. For instance because the batteries are often placed in the basement of the residence and these wires must therefore pass through the floor to connect the batteries with the set. An additional reason for having the ground and antenna connection wires free is that these circuits are usually completed close to where the set is installed.

In assembling the device of Fig. 4 the various cable wires are first connected with the plug terminals 11, as by soldering, the elements 11 with wires attached then being assembled with the plug member 10. Since the plug member 10 interfits with the socket member of Fig. 4 in only one particular relation (see my said copending applications), and since it is highly important that the electrical connections with the radio set equipment shall always be in the arrangement called for by the organization of the set, it becomes important and strictly necessary to determine

which one of the wires is connected with each particular one of the plug elements 11.

At this place I will point out that in practice I color the seven rearwardly projecting portions of the socket elements 13 (Fig. 4) respectively, red, pink, blue, yellow, green, black and brown, and by means of a chart accompanying the device in sale I give instructions to the effect that the lead wires of Fig. 4 are so to be connected with the radio set terminals that the one marked red shall be connected with the plus A battery terminal, the one marked pink with the plus B battery amplifier, and so on. Having connected up the socket member of Fig. 4 the user's next consideration is to connect the free ends of the wires of the article of Fig. 3 with the proper battery terminals, the ground and the antenna, and to enable him to do this without mistake the free ends of these wires are correspondingly colored red, pink, blue, etc., so that the user, when he telescopes the plug member 10 with the socket member of Fig. 4, simultaneously makes all of the desired connections, and can break all of these connections by simply withdrawing the plug member.

The foregoing explanatory discussion of the article leads to a description of the present invention as used by me in a method and means for determining which of the wires of the article shall be colored red, pink, blue, etc., so that the user may make no mistake, for a mistake in the connections would be likely to ruin all of the vacuum tubes and might do other damage.

Fig. 1 shows a box having mounted thereon electric lamp bulbs 25, 26, 27, 28, 29, 30 and 31 stained respectively red, pink, blue, etc., as shown in the drawings. The diagrammatic view of Fig. 2 illustrating the testing device of Fig. 1 shows a source of current supply in the form of a battery B with the bulbs bridged respectively between the main 32 and respective socket members 13^a, while a plurality of plugs 11^a are shown as being in position to enter the sockets 13^a respectively and make electrical connection therewith. From each plug element 11^a lead wires extend marked respectively 16^b, 17^b, 18^b, 19^b, 20^b, 23^b and 24^b respectively. The socket member marked 15 of Fig. 1 is to be understood as being in all material respects in accordance with the socket of Fig. 4, and the wiring of the device of Fig. 1 is to be understood as being in accordance with the diagram of Fig. 2, all to the effect that when the plug 10 is made to interfit with the socket member 15 each wire issuing from the plug 10 will be in electrical communication with the main 32 through one of the colored lamps. From Fig. 2 it will further be observed that the other battery terminal is connected to a contact member 35 and that the wire 24^b is shown as having been brought into contact with the contact 35. In Fig. 1 this contact member 35 is shown projecting through the front face of the box and one of the wires as 24 is shown as having been placed in communication with the contact 35. It is clear from Fig. 2 that on making such contact a circuit is completed through one of the wires and one of the lamps, and that thereupon the particular lamp is illuminated and shows the color with which its bulb was stained.

In front of the testing box of Fig. 1 I place an open top box (which may be of cardboard) having notches 36, 37, 38, 39, 40, 41 and 42, leading downward from the front top edge. Surrounding each of these notches is a space colored like, and in corresponding order and with, the colors shown by the lamps, namely: red, pin, blue, etc.

The operator takes one of the devices or articles of Fig. 3 and plugs it into the socket marked 15 of the tester of Fig. 1 and, having placed most of the article in the notched box and while holding the bunch of free wire ends in his left hand, he takes one at random and touches the contact 35, and thereupon one of the lamps is illuminated. The operator noting the color of that bulb places that wire so that its free end will project through the notch correspondingly indicated. According to Fig. 1 wires 16, 17 and 23, have already been determined to belong respectively in the red, yellow and black notches of the segregating box.

The operator having segregated the various wires with their free ends projecting from the container for the article sets the container to one side and takes another container and another flexible connection article and repeats the testing and end-segregating operation, and so on, while another operator takes the boxes with the projecting ends in the proper notches and by means of a brush applies a coating of red, pink, blue, yellow, green, black and brown paint to the rubber insulation adjacent to the exposed ends of the wires respectively.

The operation of determining which wire belongs in each of the notches of the box is quite rapid, as a flash of the lamp is sufficient. While the tester could apply a marker at the time, the provision of a container in which the article can be carried from place to place, and packed one on top of another, and always with the free ends of the wires exposed, greatly facilitates the marking operation, and, when paint is used, enables a veritable wall of such containers to be formed whereby the painting may be done expeditiously in vertical rows and then allowed to dry without disturbance. It is entirely feasible to apply tags or clips having identifying data thereon instead of the paint, but I find the color scheme entirely practical and satisfactory.

In Fig. 2 the multiple contact member including the terminals or socket elements 13^a

is in an arrangement well suited to the determination of the opposite ends of cabled wires where both ends are free, in which case free ends of the wires could be inserted in the respective sockets 13ª and either there held by hand or temporarily fastened by any approved means while the other ends are severally brought into engagement with the contact element 35. In such case both ends of the several wires could be marked in a corresponding way at the time.

I contemplate as being included in these improvements such changes, modifications and departures from what is herein specifically illustrated and described as fall within the scope of the appended claim.

I claim:

The method of identifying wires connected respectively to the terminals of a multiple connection device including a cable-like part, which consists in placing the respective terminals of the connection device in electrical communication with a common conductor through a plurality of electrically operated signal devices whereby each terminal is in connection with such conductor through a different one of the signal devices, completing the circuit through the respective wires and the common conductor so as to operate the respective signals, and marking the wires according to the indications of the signals respectively.

HOWARD B. JONES.