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F. P. McINTOSH

CONNECTER SWITCH

Filed August 9, 1922

Fig. 1.

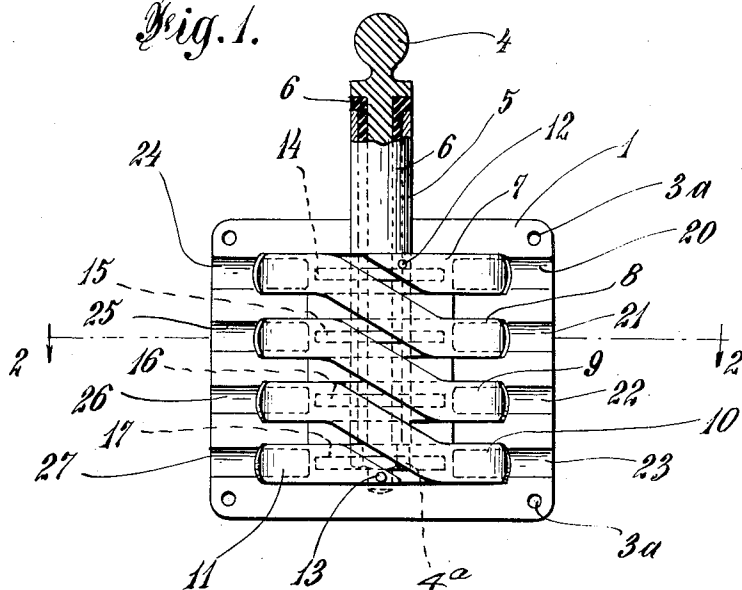


Fig. 2.

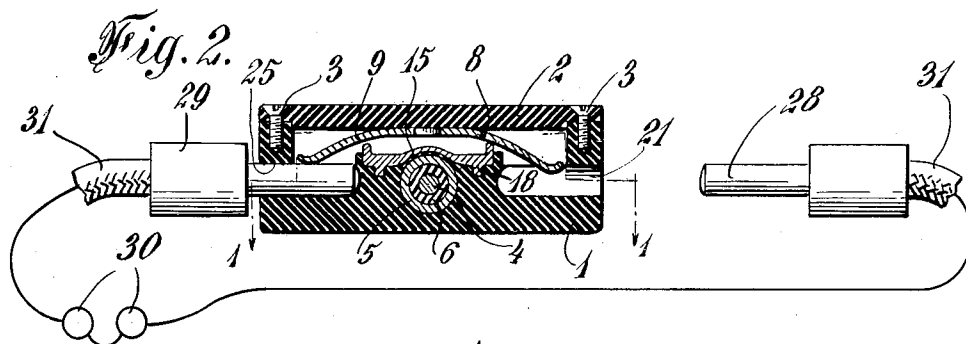
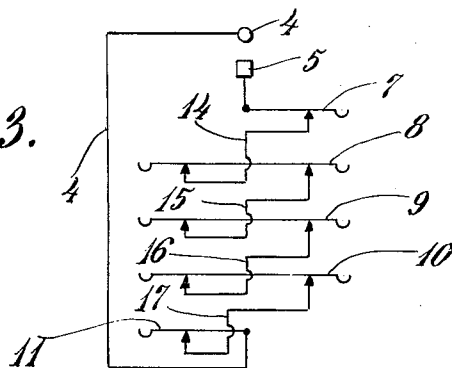


Fig. 3.



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CONNECTER SWITCH.

Application filed August 9, 1922. Serial No. 580,677.

To all whom it may concern:

Be it known that I, FREDERICK P. McINTOSH, a subject of the King of Great Britain, and residing at New York, in the county of New York and State of New York, United States of America, having invented certain new and useful Improvements in Connector Switches, do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to improvements in connector switches for electrical circuits and more particularly to connectors through which one or a plurality of sets of telephone receivers may be readily associated with a circuit.

With this object in view I provide a connector that may be associated with a circuit through the agency of suitable switching contacts such as a plug having a tip and a sleeve contact. The connector comprises a plurality of contact springs arranged to receive the terminals in which telephone receiver cords terminate whereby the receivers will be connected to said switching contacts, e. g., to the tip and sleeve contacts of a plug. The connector is so arranged that a plurality of head-phones or telephone receivers may be simultaneously and in series relation to each other associated with said switching contacts. Such arrangement of a plurality of receivers is preferable over an arrangement in which the receivers are in parallel because they offer more impedance to the current received.

In accordance with the present embodiment of the invention, a plurality of head-phones or receivers may be connected in series through the connector due to the special arrangement of the contact springs provided therein. One of the springs is electrically connected with one and another with the other switching contact of said connector, e. g., the tip and the sleeve contacts of a plug. The other contact springs in said connector are so arranged that one side of a telephone receiver may be connected therethrough directly to one switching contact (e. g., the tip contact of a plug), the other side of said receiver being connected with the other switching contact (e. g., the sleeve contact of a plug) in series with the first mentioned receiver.

In accordance with the preferred embodiment of the present invention the contact

springs of the connector terminate in small apertures or jacks provided in the connector and adapted to receive the contact points in which the receiver cords terminate. When such contact point is inserted in a jack, it will engage the end of a contact spring and will slightly displace it. One of these contact springs is permanently connected with one switching contact (e. g., the sleeve of a plug) and another one of the contact springs is permanently connected with the other switching contact (e. g., the tip of a plug). A connection is provided between these two springs through contacts of all the other springs in series. Preferably, such series connection is established through the agency of short conductors, each contacting with one end of one spring and the opposite end of the adjacent spring. However, other suitable arrangements may be provided for electrically interrelating the contact springs. Outside of the two contact springs connected with the tip and sleeve of the plug, the contact springs are preferably extending from one aperture to an oppositely positioned aperture, each end of a spring normally resting on one of said conductors and being disconnected therefrom upon the insertion of a cord tip into the corresponding jack.

The jack springs are located within a casing of insulating material and the receivers may be associated therewith by the simple insertion of the cord tips into the jacks and without the necessity of disturbing the assembly, soldering or handling screws or clamps.

It will be obvious to those skilled in the art that the invention herein disclosed is subject to embodiments of a widely varying character without departing from the spirit thereof. The purpose of the foregoing general description and that of the detailed description to follow is merely to explain the invention, and not to limit its scope for which reference would be had to the appended claims.

In the drawings, Fig. 1 is a top view of the connector partly in section and with the cover removed, the view being taken along lines 1—1 of Fig. 2; Fig. 2 is a sectional view of the connector; and Fig. 3 is a circuit diagram, schematically illustrating the electrical connections of the connector.

The connector is composed of a base 1 and a cover 2 fastened to the former by means of

screws 3 engaging tapped holes 3^a. Both the base and the cover are of some suitable insulating material such as bakelite. A hole is bored along the center line of the base 1.

5 Held within this hole is a switching member or plug comprising two switching contacts; a tip contact 4 and a sleeve contact 5. The sleeve contact is in the form of a brass sleeve surrounding the rod in which the tip
10 contact terminates and is insulated therefrom by means of a suitable bushing 6. The bushing 6 and the sleeve 5 are held in place by means of a suitable nut 4^a. The tip 4 and the upper part of the sleeve 5 protrude
15 from the base 1 to a sufficient distance to permit their connection through a jack or other suitable agency with an electrical circuit.

In sloping cut-away portions of the base 1
20 are positioned the ends of five contact springs 7, 8, 9, 10 and 11. Spring 7 is electrically connected with the sleeve 5 through the agency of a rivet 12 and spring 11 is connected with the tip through the agency
25 of a rivet 13. The contact springs 8, 9 and 10 are insulated from each other and from the plug contacts by the suitably molded base 1. These springs have a bent-up middle portion (as shown in Fig. 2) and their
30 ends rest on wires 14, 15, 16 and 17 held within the base 1 by means of ears 18 embedded therein. Each of the springs 8, 9 and 10 engages at one end one end of a wire such as 15, and at its other end the opposite
35 end of an adjacent wire such as 16. As shown in Fig. 2 for instance, the left hand end of spring 9 cooperates with the left hand end of wire 15 and the right hand end of spring 8 cooperates with the right hand end
40 of the same wire 15. With the cover 2 in place, the springs 7—11 are placed under tension. The cover 2 and the slots in the base 1 hold the contact springs against displacement.

45 In the right hand side of the base 1, four apertures 20, 21, 22 and 23 are provided, corresponding apertures 24, 25, 26 and 27 being provided in the opposite side of the base. The upturned ends of springs 7—11 project within these apertures. These apertures
50 with the spring ends projecting therein act as jacks for the terminal points 28 and 29 of a cord 31 surrounding the conductors leading to the head-phones 30. As shown in
55 Fig. 2, when such terminal point 29 is inserted in a jack, the end of the spring terminating therein, e. g. 9, is slightly displaced to break contact with the conductor 15.

Referring now to Fig. 3 it will be noted
60 that the sleeve 5 of the plug is permanently connected with the spring 7, and the tip 4 with the spring 11. By means of the conductors 14, 15, 16 and 17 a series connection is established between the tip 5 and the
65 plug 4 which series connection may be inter-

rupted in response to the actuation of any one of the springs. Assuming, for instance, that the cord tips 28 and 29 are inserted in the jacks 20 and 24, the circuit for the receiver may be traced as follows: sleeve 5, 70 contact spring 7, terminal 28, receiver 30, terminal 29, the left hand end of spring 8, the right hand end of spring 8, conductor 15, spring 9, conductor 16, spring 10, conductor 17, spring 11, and to the tip 4. With this
75 receiver in circuit, the next receiver may be connected in circuit through jacks 21 and 25. The circuit for this second receiver may be traced as follows: sleeve 5, spring 7, tip 28, receiver 30, tip 29, spring 8, the terminal
80 of the second receiver cord, the second receiver, the other terminal of the second receiver cord, spring 9, conductor 16, spring 10, conductor 17 and to the tip of the plug. In a similar manner a third and fourth set
85 of receivers may be connected in series by inserting the cord terminals into jacks 22—26 and 23—27.

One set of receivers may be bridged across
90 the tip and sleeve contacts of the plug by inserting one of the cord terminals into any one of the jacks 20—23 and the other cord terminal into any one of the corresponding
95 jacks 24—27. If, for instance, the first receiver is connected through the jacks 21 and 25 its circuit will be from sleeve 5 through spring 7, conductor 14, spring 8, the receiver, the spring 9, conductor 16, spring 10, conductor 17, spring 11 and to the tip 4. The next set of receivers may then be connected
100 through any other two oppositely located jacks. A receiver may be bridged across the switching contacts also by inserting one cord tip into jack 20 and the other tip into any one of the jacks 24—27, or one
105 cord tip into jack 21 and the other tip into any one of the jacks 25—27. Other possible combinations may be readily ascertained from the drawings.

What I claim is:

1. In a connector, a plug having a tip and a sleeve contact, a first contact spring connected with the tip contact, a second contact spring connected with the sleeve contact, a third and fourth contact spring, a conductor
110 separably engaging at one point the first contact spring and at another point the third contact spring, a second conductor separably engaging at one point the third contact spring and at another point the fourth contact spring, a conductor separably engaging
115 at one point the fourth contact spring and at another point the second contact spring, and means for actuating any one of said springs to separate it from the cooperating
120 contact point.

2. In a connector for telephone receivers, a casing, a plug having tip and sleeve contacts projecting from said casing arranged
125 in two groups, four jacks in said casing, and
130

connections within said casing for bridging a receiver across said contacts through two jacks and two receivers in series through the four jacks when each receiver is connected
5 with a jack of each group.

3. In a connector, a casing provided with two groups of apertures through which cord tips may be inserted, a plug having tip and sleeve contacts projecting from said casing,
10 contact springs in said casing with their ends within said apertures, a connection between said sleeve contact and a spring of one group, a connection between said tip contact and a spring of the other group, and a plu-
15 rality of conductors each separably engaging at one end a spring of one group and at another end a spring of the other group.

4. In a connector, a casing provided with rows of apertures on opposite sides through
20 which cord tips may be inserted, a plug having tip and sleeve contacts projecting from said casing, contact springs in said casing with their ends within said apertures, and conductors near the center of said casing
25 bridging said springs in series across said tip and sleeve contacts.

5. In a connector, a base, a first and second switching contact projecting from said base, a contact spring connected with the first switching contact, and having an end terminating at one side of said base, three
30 contact springs extending from one side of said base to the opposite side, a fifth contact spring connected with the second switching contact and having an end terminating at the opposite side of the base, a plurality of
35 conductors each contacting at one end with the end of a spring at one side of the base and at the other end with the end of the adjacent spring at the opposite side of the base, apertures in the two sides of the base in
40 alinement with the ends of the contact springs and through which the contact springs may be engaged and separated from the cooperating conductor end.
45

6. In a connector, a base, a plug having tip and sleeve contacts projecting from said base, a contact spring connected with the sleeve contact and extending from said plug
50 towards one side of said base, three contact

springs extending from one side of said base to the opposite side, a fifth contact spring connected with the tip of the plug and extending therefrom to the opposite side of the base, a plurality of conductors each contact-
55 ing at one end with the end of a spring at one side of the base and at the other end with the end of the adjacent spring at the opposite side of the base, apertures in the two sides of the base in alinement with the
60 ends of the contact springs and through which the contact springs may be engaged and separated from the cooperating conductor end.

7. In a connector for telephone receivers, 65 a plug having tip and sleeve contacts, four contact springs cooperating with the terminals of the receiver cords, and means for bridging a receiver across said tip and sleeve contacts through any two of said springs and
70 two receivers in series through the four springs.

8. In a connector for telephone receivers, a casing having two rows of apertures, a tip and a sleeve contact projecting from said casing, contact springs within said casing
75 accessible by means of receiver cord tips through said apertures, one of said springs having one end terminating in an aperture of one row and the other end in an aperture
80 of the other row, and a normally closed series connection between said tip and sleeve contacts through all said contact springs.

9. In a connector for telephone receivers, an elongated casing having a row of aper-
85 tures on two opposite sides, a tip and sleeve contact projecting from said casing substantially at right angles to said apertures, three or more contact springs within said casing, two of said springs being connected with
90 said tip and sleeve contacts and having their ends terminate within apertures in opposite rows and the two ends of the other springs projecting within apertures in opposite rows, and a normally closed series connection be-
95 tween said tip and sleeve contacts through all of said contact springs.

In witness whereof, I hereunto subscribe my name this 8th day of August, 1922.

FREDERICK P. McINTOSH.