

UNITED STATES PATENT OFFICE.

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ELECTRICAL CONNECTOR.

No. 884,312.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES L. CARNALL, a citizen of the United States, residing at New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electrical Connectors, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

My invention relates to devices for "tapping in" an electrical device or instrument, and has for its object to provide a simple and convenient device for the purpose.

My invention finds special utility in telegraph systems, when it is desired to insert in the line a temporary instrument, for instance an extra or special key.

In carrying out my invention in the preferred manner I provide a metal plate or equivalent element adapted for convenient connection with a binding post of a relay or other telegraph instrument. Carried by this plate is a pair of metal clips, one or both of which is urged toward the other by a suitable spring or springs. One of the clips, which are insulated from each other, is in electrical connection with the said plate while the other clip is in similar connection with a binding post to which is connected one of the line wires. Normally the two clips bear against each other, so that the circuit is complete from the line wire, the clips, and the supporting plate which is connected to or held by the binding post. When it is desired to insert an instrument in the line circuit the terminals of the leads of the instrument, which terminals are preferably formed of two metal strips insulated from each other, are thrust between the clips of the tapping-in device. The current then flows from the first clip to the first terminal, then through the lead connected thereto, through the instrument, back through the second lead to the second clip and thence to the supporting plate and relay binding post. When the instrument is to be cut out of the circuit the terminals are simply pulled out of the clips, whereupon the latter spring together and establish the circuit first described. It is apparent that the scheme thus briefly outlined can be embodied in a variety of devices. Of these I have selected two for illustration herein.

Referring now to the drawing, Figure 1 is a plan view of the preferred form of the invention. Fig. 2 is a side view of the same.

Fig. 3 is a section on line III—III of Fig. 1, looking in the direction of the arrow. Fig. 4 is a diagrammatic view, in plan, showing the device in use. Fig. 5 is a perspective view of another form of the invention.

The supporting plate of the device shown in Figs. 1 to 4 is indicated by 1. It is provided at one end with a deep notch or slot 2, to permit its being placed under the nut of a binding post, and at the other end carries a block 3 of insulating material. Secured in the block 3 at one corner thereof is a vertical pivot 4 in electrical connection with the plate 1 through the nut 5. On this pivot is a clip formed of a stiff metal strip 6 provided near one end with laterally projecting ears or lugs 7 having registering apertures to receive said pivot. Coiled around the latter is a spring 8 arranged to press against the clip. At the diagonally opposite corner of the block is a similar pivot, 9, and clip 10, the latter being arranged to bear with its face against the face of the other and being pressed against the same by a spring 11 around the pivot 9. As this clip 10 is not to be in electrical connection with the supporting plate 1 the latter is cut away at that corner, as shown in Fig. 3. Instead, the clip 10 is connected, by its spring, to a binding post 12 mounted on the adjacent side of the insulating block 3. The plug to be used with the above device is shown in Fig. 4 and consists of two strips 13, 14, of metal, preferably of the same width as the clips 6 and 10, and separated by a strip 15 of insulating material. The strips 13, 14, are connected at their inner ends to the leads of the device, diagrammatically indicated at 16, which is to be inserted in the line. The connections of the plug-strips and the leads are preferably inclosed or covered by a tightly fitting protecting sleeve 17 of insulating material.

The method of using the device is shown in Fig. 4. In this figure, 18 indicates an ordinary telegraph relay and 19, 20 the main-line binding posts thereof. Under the nut of one of the binding posts, as 20, the line conductor 21 being first disconnected therefrom, I insert the plate 1, not shown in this figure for the sake of clearness. The conductor 21 is now connected with the binding post 12 on the tapping-in device, whereupon the device is ready for use, with the circuit completed through binding post 12, clip 10, clip 6, and binding post 20. If now the connecting plug of the device 16 is inserted be-

tween the clips, as shown in Fig. 4, the clips will make electrical contact with the respective plug-strips and establish the circuit through the device which is to be inserted in the line. Upon withdrawal of the plug the original circuit is instantly reestablished. It is to be understood, of course, that the tapping-in device is not limited to use with a relay and that the device diagrammatically shown at 16 may be of any nature, for example a so-called "semi-automatic" telegraph key in which the dots by the Morse code are made by an automatically vibrating contact under the control of the operator.

Another form of the invention is shown in Fig. 5. In this figure the supporting plate 1^a, notched at 2^a as in the former case, has an upwardly extending part 22, the top of which constitutes one of the terminal-receiving clips, 6^a. On this upwardly extending or angular portion is secured a block 3^a of insulating material. Pivoted at the ends of this block is a member 23 of inverted U-shape, carrying at its top the other clip, 10^a. This member is pressed toward the clip 6^a by a spring 11^a surrounding the pivot 9^a, and is in electrical connection with its clip 10^a and a binding post 12^a on the adjacent side of the block 3^a. This type of device is used in the same way as the other, the plate 1^a being connected with a binding post, one of the line wires being brought to the binding post 12^a. The terminal plug of the device which is to be inserted in the circuit is then thrust between the clips 6^a, 10^a, as shown in Fig. 5. In order to lessen the liability of accidental displacement of the plug the upper edge of the clip 6^a may be turned over the plug, as shown at 6^b.

From the foregoing it will be seen that my invention provides simple and convenient means for the purpose mentioned. The device may be left permanently in the line if desired, and is then ready for use at any time.

The invention is cheap to manufacture, particularly the form shown in Figs. 1, 2 and 3, the different parts being formed by automatic machinery at low cost.

What I claim is:

1. In an electrical tapping-in device, the combination of a supporting member adapted for connection with a binding post, an insulating block on said supporting member, a clip in electrical connection with the sup-

porting member, a second clip pivoted on said insulating block, means for holding the clips in yielding contact with each other or with a terminal plug thrust between the two, and a binding post carried by the insulating block and electrically connected with the second-mentioned clip.

2. In a tapping-in device, the combination of a supporting member, a pair of clips in yielding contact with each other and adapted to receive a terminal-plug between them, one of said clips being electrically connected with the said supporting member, and a binding post in electrical connection with the other clip.

3. In a tapping-in device, the combination of a supporting member adapted for connection with a binding post, an insulating block carried by the supporting member, a pair of clips pivoted on the said block, one of said clips being electrically connected with said supporting member and the other insulated therefrom, springs arranged to press said clips toward each other, and a binding post carried by the insulating block and electrically connected with the said insulated clip.

4. In a tapping-in device, the combination of a supporting plate adapted for connection with a binding post, a spring-actuated clip electrically connected with said plate, a spring-actuated clip insulated from said plate and arranged to cooperate with the first clip, and a binding post insulated from the plate and electrically connected with the second clip.

5. In a tapping-in device, the combination of a supporting plate adapted for connection with a binding post, an insulating block mounted thereon, a binding post on the block, and a pair of spring-pressed clips mounted on the block, one clip being electrically connected with the supporting plate and the other with the binding post carried by the block.

6. In a tapping-in device, in combination, an insulating block, pivots carried thereby, clips mounted on the pivots, and springs arranged to press said clips toward each other.

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Witnesses:

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