Oct. 30, 1934. H. A. DOUGLAS 1,978,933

CIRCUIT CONTINUING DEVICE

Filed Oct. 26, 1931

Fig. 2

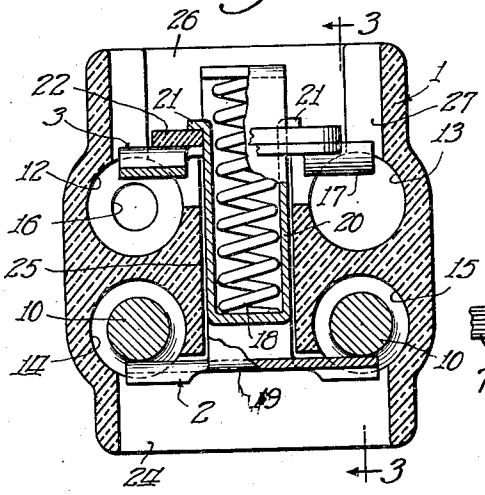


Fig. 3

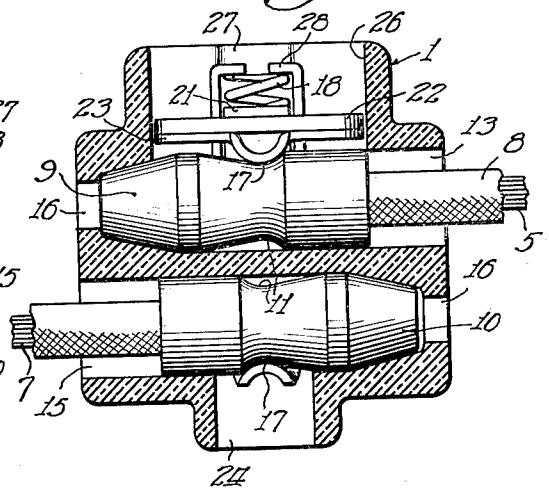


Fig. 4

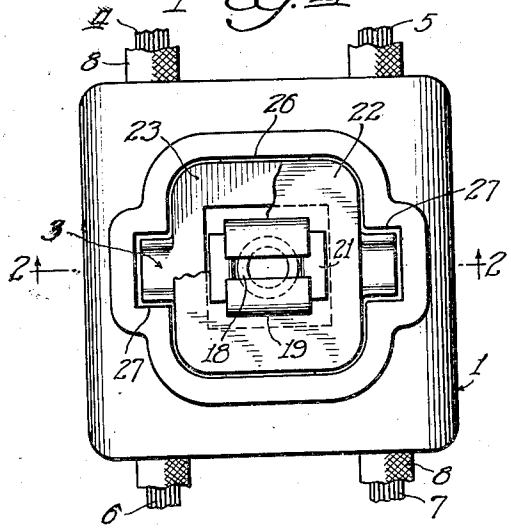


Fig. 5

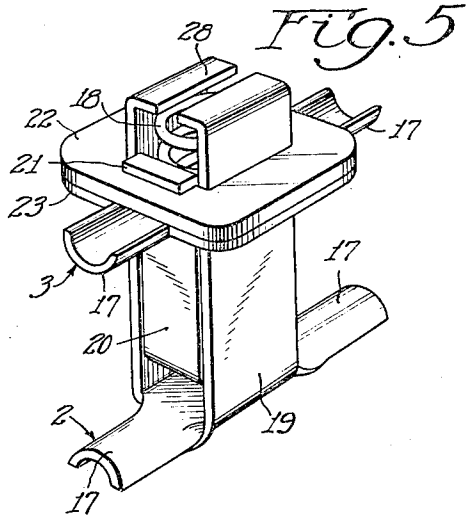
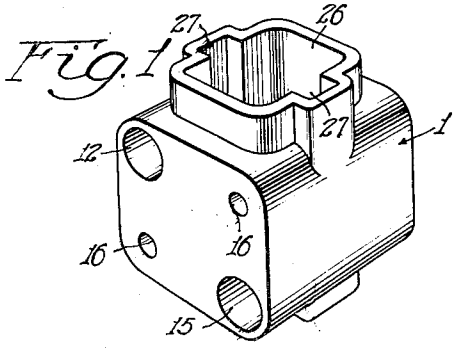


Fig. 1



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UNITED STATES PATENT OFFICE

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CIRCUIT CONTINUING DEVICE

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Application October 26, 1931, Serial No. 571,056

6 Claims. (Cl. 173—328)

This invention relates to circuit continuing devices for electrical conductors and is of particular utility in providing an improved line connection for a plurality of current conducting wires for a plurality of circuits.

Among other objects, the invention aims to provide an improved housing for a plurality of metallic terminal plugs for a plurality of circuit conductors for a plurality of circuits and having means associated therewith for yieldingly engaging the plugs and for making a connection between the plugs of a given pair, while at the same time maintaining the plugs of one pair insulated from the plugs of another pair.

The invention may be understood by reference to the illustrative construction shown in the accompanying drawing, in which—

Figure 1 is a perspective view of a preferred form of my improved housing;

Figure 2 is a cross section taken on the line 2—2 of Figure 4 with one pair of terminal plugs removed and other parts broken away;

Figure 3 is a longitudinal section taken on the line 3—3 of Figure 2 with another terminal plug inserted;

Figure 4 is a plan view of the device with two pairs of current conductors connected parts being broken away; and

Figure 5 is a separate view of a preferred form of detent mechanism associated with the housing.

Referring in detail to the figures of the drawing, I have shown in Figure 1 a housing 1 which is desirably formed of insulating material such as hard rubber. The housing may be molded to shape and may have associated therewith as by being disposed therein, the metallic detent members 2 and 3.

In the illustrative construction, the housing is adapted to provide a line connection between the terminals of a plurality of pairs of current conductors for a plurality of circuits. For example, the current conducting wires 4 and 7 constitute one pair of conductors, and the current conducting wires 5 and 6 another pair. These wires may have the usual insulation 8 thereon except where the wires are stripped to have their ends soldered within the bores of metallic terminal plugs as is well known in the art. In this instance the plugs 9 are the terminals of the wires 5 and 6, and the plugs 10 are the terminals of the wires 4 and 7. Each of the terminal plugs is advantageously formed with a bulbous tip providing cam surfaces on the tip and an annular groove 11 at the base of the tip, which cooperate with the detent members 2 and 3, as presently described.

As here shown, the housing 1 has a plurality of pairs of recesses therein, in this instance the parallel recesses 12 and 13, constituting one pair, and the parallel recesses 14 and 15 constituting another pair. As shown, the recesses are arranged substantially abreast, thus minimizing the size of the housing and making for desirable compactness thereof. Each of the recesses is adapted to snugly receive one of the terminal plugs, the plugs of a pair being inserted as here shown in opposite directions. If desired, the inner end of each recess may be apertured as at 16, the aperture 16, however being smaller that the diameter of the extreme end of the tip of the plug, so that the margin of the aperture 16 will provide a stop for the plug, thus assisting in locating the plug with respect to its detent.

The detent members 2 and 3 are spring pressed to have yielding engagement each with the plugs of a pair of current conductors, the plugs being inserted against the force of the spring. They may be withdrawn by pulling on the wires. The detent members desirably have the arcuate surfaces 17 which ride over the cam surfaces formed by the bulbous tips of the terminal plugs and snap into the annular grooves 11.

In the present exemplification, the detents 2 and 3 are pressed upon by a single coil spring 18 which is interposed between the detents and urges them in opposite directions. To accomplish this result I have here shown a structure which includes a yoke 19 fixed to and in this case formed integrally with one of the detent members, for example, the detent 2. The yoke 19 slidingly receives the stirrup 20, the compression coil spring 18 being inserted between the stirrup and the yoke, thus pressing upon both these members and urging them in opposite directions. Engagement of the yoke 19 with the detent member 2 being fixed, I provide means on the stirrup for pressing against the other detent member 3 to press this detent in the same direction that the stirrup is pressed. Such means are here represented by the lugs 21 formed by the laterally turned ends of the stirrup, which lugs press upon the detent member 3. Since the detent member 2 electrically connects the current conductors 4 and 7, constituting the conductors of one circuit, the detent member 3, which connects the current conductors 5 and 6, must be insulated from the detent member 2. For this purpose, I have here shown the lugs 21 which happen to be in electrical connection with the

detent 2, as pressing the detent member 3 through the intermediation of the insulating washer 22, the detent member 3 having a frame-like mid-portion 23 which forms a rectangle about the outer margin of the insulating washer 22 spaced from the stirrup 20 and the yoke 19, so that no portion of the detent member 3 contacts directly with any metal member which is in electrical connection with the detent member 2.

To assemble the detent members 2 and 3 with the housing 1, the detent 2 with the yoke 19 therein may be first inserted through the opening 24 in the housing, the opening 24 intersecting the recesses 14 and 15, so that the detent 2 when inserted in place also intersects those recesses. The yoke 19 is passed through the passage 25 which extends entirely through the housing 1 and communicates with another opening 26 in the side of the housing opposite to the opening 24. The opening 26 intersects the recesses 12 and 13. When the yoke 19 is in place, the stirrup 20 and the spring 18 carried thereon may be slipped into the yoke through the opening 26. Then the detent member 3 may be dropped in place around the yoke and stirrup, the opening 26 receiving the rectangular portion 23 of the detent 3 and having lateral extensions 27 which receive and serve to guide the arcuate portions of the detent. After the detent member 3 is in place the insulating washer 22 is placed over it, and the ends of the stirrup are bent over to form the lugs 21. The spring 18 is then compressed and the wall 28 of the yoke member 19, which is split for this purpose, is formed as shown, providing a bearing for one end of the spring. Thus the spring 18 urges the detent 2 to intersect the recesses 14 and 15 and also urges the detent 3 to intersect the recesses 12 and 13 to yieldingly engage the plugs of the respective current conductors the detents being movable in the housing and being insulated from each other and the plugs being also insulated except where electrically connected by their respective detents.

Changes may be made within the scope of the following claims without departing from the invention:

1. A device of the class described comprising an insulating housing having a plurality of pairs of parallel recesses for receiving a plurality of pairs of metallic terminal plugs of a plurality of circuit conductors for a plurality of circuits, all of said recesses being arranged substantially abreast; metallic detents associated with the housing, said detents making an electrical connection between the terminal plugs of each pair; a spring between the detents; means carried by the housing including said spring for urging the detents in opposite directions to engage respectively a pair of plugs; and means for insulating one detent from the other.

2. A device of the class described comprising an insulating housing having a plurality of pairs of parallel recesses for receiving a plurality of pairs of metallic terminal plugs of a plurality of circuit conductors for a plurality of circuits; metallic detents movable in the housing, said detents making an electrical connection between the terminal plugs of each pair; a yoke fixed on one of the detents; a stirrup slidable in said yoke; means on the stirrup for pressing against the other detent; insulating means between the stirrup and the other detent; and a coil spring carried by the stirrup and pressing against the yoke, whereby the detents are yieldingly urged in opposite directions.

3. The structure of claim 2 wherein the detent that is pressed upon by the stirrup has a mid-portion of rectangular shape surrounding the stirrup but spaced therefrom.

4. The structure of claim 2 wherein the detents have arcuate surfaces for conforming to arcuate grooves in the terminal plugs.

5. A device of the class described comprising a molded integral insulating housing having two sets of parallel recesses one above the other for receiving respectively two pairs of electrical terminal plugs of the bulbous type with a snap action, said housing having an additional recess between said respective pairs, metallic detents movable therein guided by the walls of the housing and adapted to snap over the bulbous tips of the plugs, means forming a sliding and insulated connection between said detents within said additional recess, and a single spring coacting with said connection to press the detents for both pairs into engagement with their respective plugs both for yieldingly retaining the plugs in the recesses and for providing an electrical connection between the plugs of each pair, said spring pressing the detents of one pair in the opposite direction from the detents of the other pair.

6. A device of the class described comprising a molded integral insulating housing having a plurality of pairs of recesses for receiving the metallic terminal plugs of a plurality of electrical conductors; openings in the housing each intersecting one of the pairs of recesses; metallic detents received in each opening to also intersect each pair of recesses; a passage through the housing communicating with said openings; and unitary mechanism received in the passage and engaging the detents to press them into their respective recesses.

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