Aug. 27, 1940. N. C. SCHELLENGER 2,212,815

TERMINAL CONSTRUCTION

Filed Jan. 9, 1939

Fig. 1.

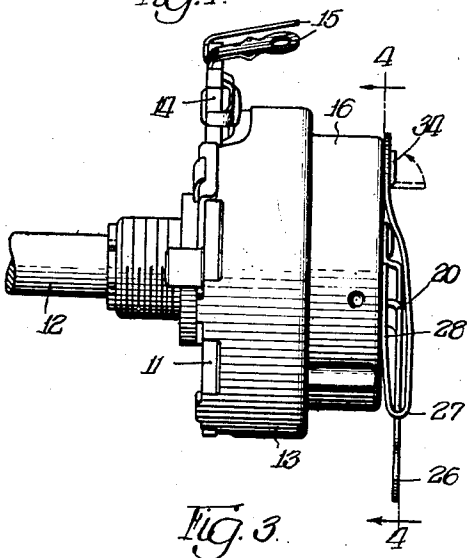


Fig. 2.

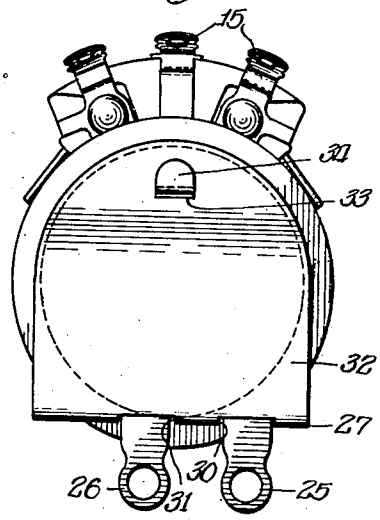


Fig. 3.

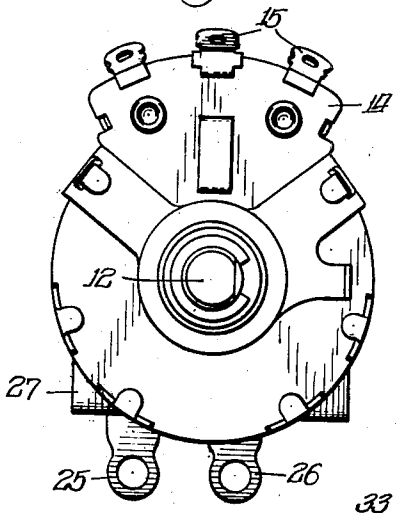
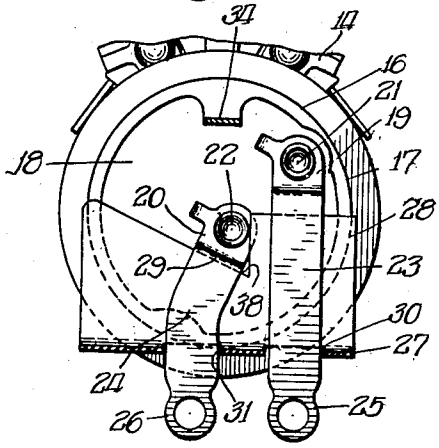


Fig. 4.



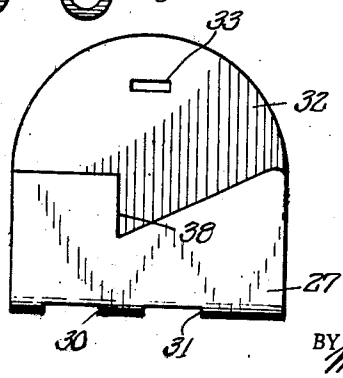


Fig. 5.

INVENTOR.
Newton C. Schellenger.
BY Wilkinson, Huxley, Byron & Knight
ATTORNEYS.

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UNITED STATES PATENT OFFICE

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TERMINAL CONSTRUCTION

Newton C. Schellenger, Elkhart, Ind., assignor to Chicago Telephone Supply Company, Elkhart, Ind., a corporation of Indiana

Application January 9, 1939, Serial No. 249,902

8 Claims. (Cl. 173—324)

This invention relates to a new and improved terminal construction and more particularly to a combined construction of terminals and insulation for use in electrical control units.

In units of this character it is often desirable to have the wire connecting portions of terminals extend substantially parallel to and adjacent the face of the unit. Such units are often used in assemblies where space is limited and where it is important to protect leads carrying heavy currents with insulation in so far as is practical.

It is an object of the present invention to provide a new and improved insulated terminal construction.

It is a further object to provide a construction of this character in which terminals are insulated from each other and from adjacent portions of the device to which they are secured.

It is also an object to provide a construction in which the insulation is positively held in place without the use of additional securing members.

It is an additional object to provide a construction which is compact and efficient and adapted for commercial production.

Other and further objects will appear as the description proceeds.

I have shown certain preferred embodiments of my invention in the accompanying drawing, in which—

Figure 1 is a side elevation of an electrical control unit with the invention applied thereto;

Figure 2 is a view of Figure 1 as seen from the right;

Figure 3 is a view of Figure 1 as seen from the left;

Figure 4 is a section taken on line 4—4 of Figure 1; and

Figure 5 is a face view of the insulation member as seen from below.

The control unit shown is a combination switch and variable resistance, the details of construction of which form no part of the present invention. It may be of the character shown in my prior application, Serial No. 218,062, filed July 9, 1938, which matured into Patent No. 2,177,290, issued October 24, 1939. The variable resistance is provided with a base 11, operating shaft 12 and metallic housing 13 secured to the base. The base 11 is provided with an extended portion 14 carrying the terminals 15 for the variable resistance. The switch is mounted upon the variable resistance housing 13, the switch housing having a metallic wall 16 secured to the resistance housing 13. The metallic wall 16, as best shown in Figure 4, has a rim 17 extending over the edge of the outer face of the insulation member 18 which carries the switch structure upon its inner face. The switch is provided with the terminals 19 and 20 extending from the insulating plate 18 and secured in place by the rivets 21 and 22. These terminals 19 and 20 have flat, intermediate portions 23 and 24 extending substantially parallel to the face of the switch housing formed by the insulation member 18 and extending above the metallic rim 17 of that face. It is to be noted that the wire securing portions 25 and 26 of terminals 19 and 20 extend beyond the switch housing. These terminals extend in the opposite direction from the terminals 15 of the variable resistance unit. This is for the reason that the switch normally controls either alternating current or in the case of automobile radios controls current interrupted by a vibration, and it is desirable to keep these switch leads away from the variable resistance leads in order to prevent pickup from the switch by the variable resistance connections.

The folded insulation member 27 is provided with the lower portion 28 located between the terminal portions 25 and 26 and the insulation face 18 and the metallic rim 17. This portion 27 is notched at 30 to fit against the offset portion 29 of the terminal 20 and positively locate the insulation relative to the terminals. The insulation member 27 is provided with the perforations 30 and 31 which permit the wire securing portions 25 and 26 of the terminals to extend beyond the insulation for the connection of suitable wires. The upper portion 32 of the insulation member 27 is folded over against the outer face of the terminals 19 and 20 and completely covers these terminals. It is provided with a perforation 33 through which passes an extension 34 formed on the metallic rim 17 of the housing 16. This extension 34 after passing through the opening or perforation 33 is bent down against the outer face of the outer insulation portion 32 to retain it in place.

It will be apparent that by the coaction of the notch 30 with terminal 20 and the passage of the terminal portions 25 and 26 through the openings 31, the extension or lug 34 serves to positively locate the insulation and maintain it fixedly in place. The insulation effectively protects the major portion of the terminals from outside contact and fully protects the terminals against being forced into electrical contact with the metallic rim of the switch housing. No extra parts are required to fasten the insulation in place and it may be rapidly assembled and secured in place.

While I have shown preferred embodiments of my invention it is to be understood that they are capable of modification and change to meet varying conditions and requirements, and I contemplate such variations as come within the spirit and scope of the appended claims.

I claim:

1. In combination with an electrical control unit and housing therefor, said housing having

a metal portion, a terminal carried by one wall of the housing and having a portion extending over the metal portion of the housing but spaced therefrom, a folded terminal guard of sheet insulation having superimposed portions connected by the fold and having a hole at its fold, said terminal guard having one of its portions interposed between the terminal and the adjacent metal portion of the housing, and having its other portion overlying the major part of the outer face of the terminal with the end portion of the terminal projecting through the hole in the terminal guard, and an extension from the metal portion of the housing overlying one of said superimposed portions of the terminal guard to hold the terminal guard in place.

2. In combination with an electrical control unit and housing, said housing comprising metal portions, a terminal extending from and adjacent to a face of the housing, a folded insulation member having a portion extending between the terminal and metal portions of the housing, a second portion covering the major part of the outer face of the terminal, the insulation member having a perforation therein, and an extension from a metal portion of the housing passing through the perforation and bent against the outer face of the insulation to hold it in place.

3. In combination with an electrical control unit and housing therefor, said housing having a face of insulation and a metallic rim, a terminal extending from said face and overlying the same with its outer end portion extending across the metallic rim, and a folded insulation member having superimposed inner and outer portions connected by the fold and having a hole adjacent to the fold, the inner portion being disposed between the terminal and the metallic rim and having a notch engaging the terminal adjacent to the face from which it extends to properly locate the insulating member relative to the terminal, and the outer portion covering the major part of the outer surface of the terminal with the outer end portion of the terminal projecting through the hole in the fold.

4. In combination with an electrical control unit and housing, said housing having a face of insulating material with a metallic rim, a terminal projecting from said face and extending substantially parallel thereto and adjacent to and beyond the metallic rim, a folded insulation member having a portion disposed between the terminal and metallic rim and having a notch engaging the terminal adjacent to said face of insulating material and having a second portion covering the major part of the terminal, said second portion of the insulation member having an opening therein, and an extension from the metallic rim passing through the opening and overlying the portion of the insulation member adjacent to the opening to secure the insulation member in place.

5. In combination, an electrical control unit having a housing, said housing having a metal side wall and a substantially flat end wall of insulation, a terminal having an attaching portion secured to said end wall and an outward extension offset from its attaching portion and overlying said end wall in substantial parallelism therewith and extending across and beyond the rim of the metal side wall, an insulation guard having a substantially flat portion covering the entire end wall and overlying all but the outer end portion of the terminal and having a portion disposed between the terminal and the rim of the metal side wall to prevent grounding the terminal to the metal side wall, and an extension from said metal side wall bent over the insulation guard to secure the same in place.

6. In combination, an electrical control unit having a housing, said housing having a metal side wall, a terminal extended from an end wall of the housing and overlying the same with its outer end portion extending across and projecting beyond the rim of the metal side wall, an insulation guard disposed over said end wall and covering all but the outer end portion of the terminal, a part on said insulation guard interposed between the terminal and the adjacent part of the side wall rim, a connection between said insulation guard and the terminal holding the guard against movement away from the end wall, and an extension from the metal side wall connected with the insulation guard in a manner preventing disconnection of the guard from the terminal and securing the guard in position over the end wall.

7. As an article of manufacture, an insulation guard for use with an electrical control unit having a housing which is partially of metal and having a terminal mounted on insulation and extending across a metal portion of the housing, said guard comprising a piece of sheet insulation folded medially of its ends to provide superimposed inner and outer portions and having a hole at its fold through which the terminal is projectible, the inner portion of the guard being shorter than the outer portion and having a notch in its end to receive the terminal adjacent to its mounting when the guard is properly applied with its inner portion lying between the terminal and the adjacent metal part of the housing and its outer portion covering all but the outer end portion of the terminal.

8. The combination with an electrical control unit of the type having a housing including, a substantially flat end wall of insulating material and a metal side wall connected with the end wall in such a manner that portions of the metal side wall are exposed at the outer face of the end wall, and having a terminal mounted on the end wall and extending across the end wall and beyond its juncture with the metal side wall, of an insulating guard for electrically insulating the terminal from the metal side wall and for protecting the major portion thereof from contact with adjacent objects, said guard comprising a strip of sheet insulation folded medially of its ends to provide superimposed substantially flat portions and having a hole at its fold through which the terminal projects, and means for holding the insulating guard assembled with the control unit housing with both portions thereof substantially parallel with the end wall of the housing and with the inner portion thereof interposed between the terminal and the adjacent parts of the metal side wall and the outer portion thereof covering the major portion of the terminal and the end wall.

NEWTON C. SCHELLENGER.