Sept. 17, 1929. O. A. COLBY 1,728,786

TERMINAL

Filed May 15, 1926

Fig. 1.

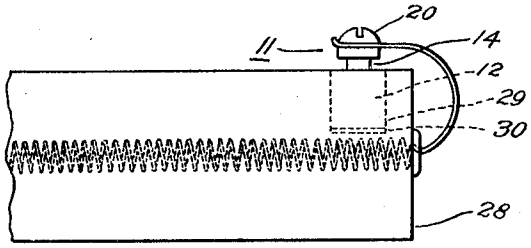


Fig. 2.

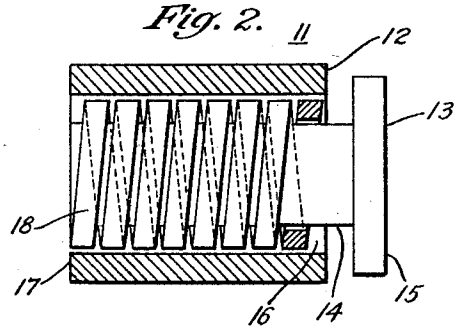


Fig. 3.

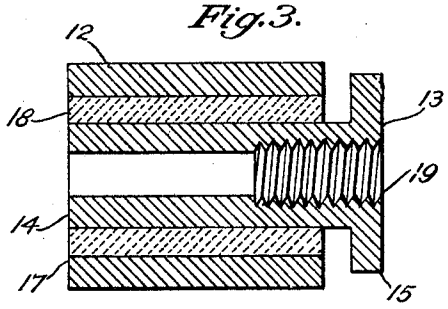


Fig. 4.

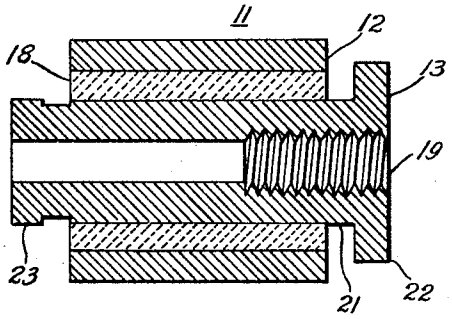
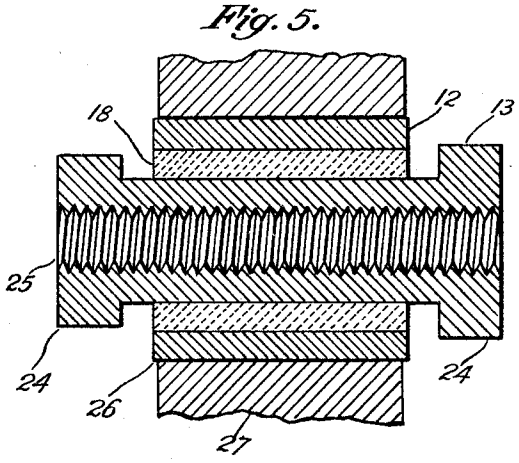


Fig. 5.



WITNESSES:

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1,728,786

UNITED STATES PATENT OFFICE

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TERMINAL

Application filed May 15, 1926. Serial No. 109,286.

My invention relates to electric translating devices, and particularly to electric terminals therefor.

An object of my invention is to provide a compact electric terminal that is adapted to be secured to electrically conducting bodies and to be insulated therefrom.

Another object of my invention is to provide a terminal for electric translating devices that shall be easy to manufacture and compact and rugged in structure.

Another object of my invention is to provide a terminal for electric translating devices that shall have a minimum number of parts and be adapted to have an electric conductor attached to either or both ends thereof, as desired.

In practicing my invention, I provide a pair of cylindrical members which are preferably of tubular form. One of the cylindrical members is smaller in diameter than the other and is adapted to be inserted within the larger member. A suitable clearance space is provided between the two cylindrical members which is adapted to be occupied by a relatively thin helix of magnesium metal. By treating the magnesium metal according to the process described in United States Letters Patent No. 1,451,755, issued to C. B. Backer, it is transformed into magnesium oxide. During the transformation from the metallic to the oxide state, the magnesium undergoes such change in volume that the cylindrical members are held fixed relatively to each other. The magnesium oxide serves, also, as an electric insulator.

In the single sheet of drawings, Figure 1 is a view, in front elevation, of an electric translating device, such as a heater, in which the terminal member embodying my invention is inserted;

Fig. 2 is an enlarged view, in longitudinal, vertical section, of a terminal member embodying my invention, showing the magnesium metal in place before oxidation;

Fig. 3 is a view in longitudinal section of the device illustrated in Fig. 2, in which the magnesium metal has been changed or transformed to magnesium oxide;

Fig. 4 is a longitudinal, sectional view of a slight modification of the terminal member illustrated in Figs. 2 and 3, and

Fig. 5 is a similar view of a still further modification of the terminal member illustrated in Fig. 4.

Referring more particularly to Fig. 2 of the drawing, a terminal member 11 comprises an outer cylindrical member 12 and an inner cylindrical member 13. The cylindrical member 13 comprises a longitudinally extending portion 14 and a laterally extending flange portion 15. The longitudinally extending portion 14 of the cylindrical member 13 is of sufficient diameter to provide a clearance space 16 between the cylindrical portion 14 and the inner surface 17 of the cylindrical member 12. A helix 18 of expansively oxidizable material, such as magnesium, is inserted in the clearance space 16, substantially as illustrated in Fig. 2 of the drawings.

By subjecting the terminal member 11 to an atmosphere of steam under high pressure, the magnesium-metal helix 18 is transformed from the metallic to an oxide state. During the transformation from the metallic to the oxide state, the magnesium expands and fills the space 16 very compactly to maintain the cylindrical members 12 and 13 in rigid fixed relation to each other. The magnesium oxide has a high dielectric strength and serves to insulate, electrically, the member 13 from the member 12.

In Fig. 3 of the drawings, I have illustrated the member 13 as having a screw-threaded portion 19 which is adapted to register with a screw-threaded member 20, illustrated in Fig. 1, whereby the end of an electric resistor or an electric conductor may be secured thereto.

In Fig. 4 of the drawings, I have illustrated a modification of the tubular member 13 shown in Figs. 2 and 3. The tubular member 13 comprises a cylindrical portion 21 which has a laterally extending flange portion 22 at one end thereof and a laterally extending flange portion 23 located at the other end. One end of the member 13 is provided with a screw-threaded portion 19.

In Fig. 5 of the drawings, I have illus-

trated a further modification of the terminal member 11 in that the cylindrical member 13 is provided with two laterally extending flange portions 24 and a threaded portion 25 which extends through the length of the cylindrical member 13. The cylindrical member 13 is fixed relatively to the cylindrical member 12 in the same manner as it is secured in Figs. 3 and 4 of the drawings.

In the particular embodiment shown in Fig. 5, the tubular member 12 is located in an aperture 26 of a member 27 which may be a portion of an electric heater or of any electric translating device, as the case may be. The cylindrical member 12 may be brazed. soldered or mechanically attached to the body portion 27, as desired.

In Fig. 1 of the drawings, I have illustrated a terminal member 11, such as shown in Figs. 2 and 3 of the drawings, which is inserted into a body portion 28 of any suitable electric heater. In this particular case, the bottom of the opening 29, into which the terminal member is inserted, may be filled with a refractory insulating material 30. The cylindrical member may then be brazed, soldered or secured by any other suitable means to the body portion 28 to maintain it in fixed relation therewith.

It is to be understood, that the term cylindrical member is not to be limited to cylinders of circular section for they may be either rectangular or oval as desired. Although the drawings show only one member 13 within a member 12, it is also to be understood that I may place two or more cylindrical members within a single cylindrical member and secure them in place by expansively oxidized magnesium metal substantially as hereinbefore described.

While I have illustrated a few preferred forms of the terminal member embodying my invention, various other modifications may be made therein without departing from the spirit and scope of my invention. I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and the appended claim.

I claim as my invention:

The method of making an electrical terminal which comprises locating a tubular member within another tubular member, partially filling the space therebetween with metallic magnesium, and then expansively oxidizing the metallic magnesium to hold the inner tubular member in the outer tubular member and electrically insulate the two members from each other.

In testimony whereof, I have hereunto subscribed my name this 8th day of May, 1926.

ORA A. COLBY.