Jan. 29, 1929. 1,700,172

L. K. MARSHALL

CONTACT TERMINAL CONSTRUCTION

Original Filed Feb. 26, 1925

Fig. 1.

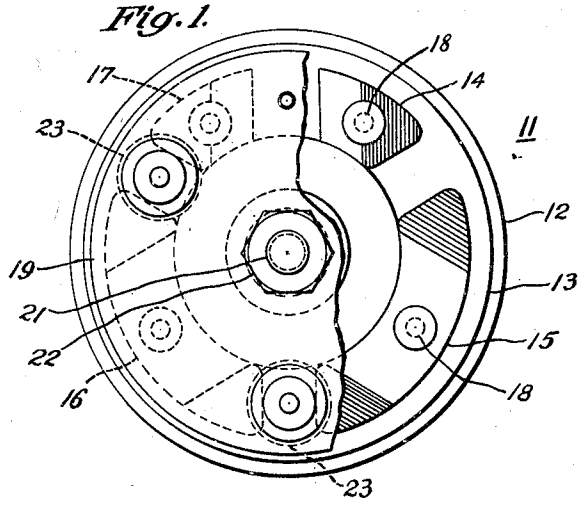


Fig. 2.

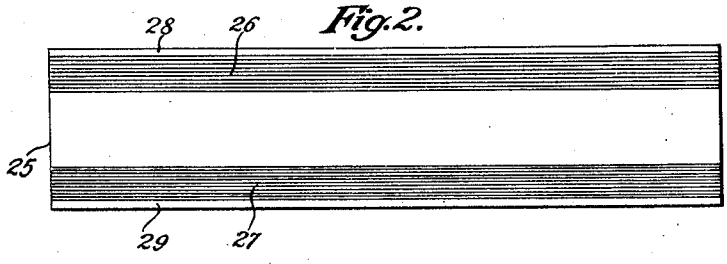


Fig. 3.

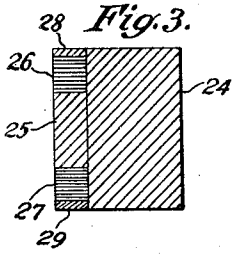


Fig. 4.

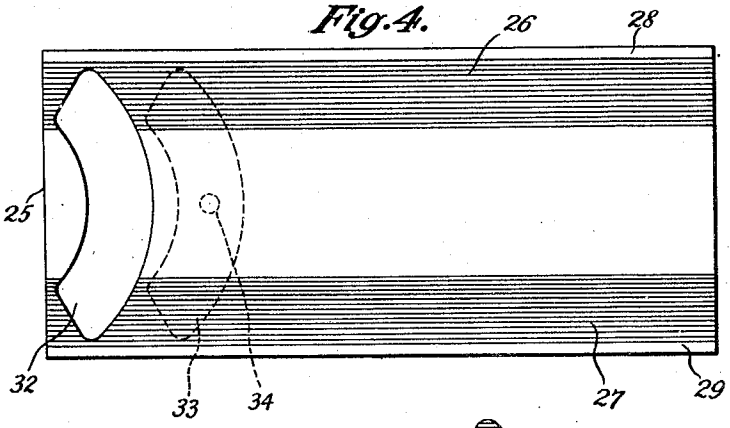


Fig. 5.

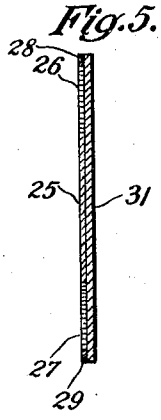
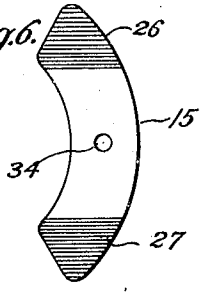


Fig. 6.



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Patented Jan. 29, 1929. 1,700,172

UNITED STATES PATENT OFFICE.

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CONTACT-TERMINAL CONSTRUCTION.

Application filed February 26, 1925, Serial No. 11,895. Renewed November 11, 1927.

My invention relates to electric switches and particularly to contact members therefor.

One object of my invention is to provide a relatively simple and inexpensive contact terminal that shall embody a relatively small number of parts.

In practicing my invention, I provide a bar of a base metal having portions of reduced thickness on which are located metal portions of high electrical conductivity, the thickness of the two metals having been reduced by rolling to the desired final thickness.

In the single sheet of drawings,

Figure 1 is a top plan view of a thermostatic switch aggregate embodying my invention, a portion thereof being broken away,

Fig. 2 is a top plan view of an ingot employed in manufacturing the device embodying my invention, in its initial condition,

Fig. 3 is an end view thereof,

Fig. 4 is a top plan view of a composite bar after rolling,

Fig. 5 is an end view thereof, and

Fig. 6 is a top plan view of a finished contact member embodying my invention.

A thermostatic switch aggregate 11 comprises a base portion 12 of a substantially circular metal member, upon which is located a circular disk 13 of a suitable insulating material, such as mica. A plurality of contact members 14, 15, 16 and 17, are held against the upper surface of the insulating disk 13 by suitable means comprising rivet members 18 for each of the respective segments.

The thermostatic disk 19 is of the kind disclosed in Patent No. 1,491,363, issued April 22, 1924, to J. A. Spencer. This disk is supported on the circular base plate or member 12 by a through-bolt 21 and a cooperating nut 22 mounted thereon.

A plurality of contact bridging members, comprising disks 23, are secured to the thermostatic disk in spaced position adjacent to the periphery thereof and insulated therefrom and in such position that they will operatively engage the adjacent end portions of pairs of the respective fixed contact members 14 to 17, inclusive.

The construction and mounting of the contact bridging members is not further described in the present application, as it forms no part of my invention.

The method of manufacturing the contact or terminal plates is as follows: A relatively heavy bar or ingot 24, illustrated in Figs. 2 and 3 of the drawing constitutes the base of the member. This bar may consist of plater's bronze or of Monel metal. An intermediate bar 25, either of plater's bronze or of Monel metal has clamped thereagainst, at each side, bars 26, and 27 of silver, and relatively thin bars 28 and 29, of bronze or of Monel metal, are clamped against the outside surfaces of the silver bars. All of the bars 25 to 29 inclusive are of the same height and are brazed together, thin strips of silver solder or of phosphor bronze being placed between the contacting surfaces to effect proper brazing. The compound bar thus constituted is then brazed against one surface of the bar 24, a strip of either phosphor bronz or of Monel metal being placed therebetween to assist in the brazing operation in a manner well known in the art. The bottom surface of the compound bar comprising bars 25 to 29 inclusive may be ground smooth in order that the brazing operation may be properly carried out.

I have obtained satisfactory results by employing a bar 24 approximately three-fourths inch thick and one and one-eighth inches wide. The bar 25 is approximately one-half inch wide, the bars 26 and 27 are approximately one-fourth inch wide, and the bars 28 and 29 are approximately one-sixteenth inch wide. The depth of these bars is approximately one-fourth inch. While I have given specific dimensions, I do not desire to be restricted thereto as these are illustrative and proportional only and may be departed from.

The composite bar is cold rolled longitudinally thereof a sufficient number of times, and, is also annealed a plurality of times in order to maintain the materials in proper condition to be reduced in thickness and to be increased in length, as well as, to a lesser extent, in width. The general shape of the composite bar after the rolling operations is indicated in top plan view in Fig. 4, and in end view in Fig. 5 thereof and it may be noted particularly that the depth of the silver inserts 26 and 27 constitutes an appreciable portion of the total depth of the base member bar, there designated by the

numeral 31 to indicate that it has changed its dimensions from those shown originally for the bar 24. The thickness of the member 31 is approximately 1/32".

Fig. 6 of the drawing illustrates an arcuate contact member or plate 15 that has been punched from the rolled composite bar, illustrated particularly in Fig. 4 of the drawing where I have indicated an opening 32 therein from which a plate 15 has been punched. The broken lines 33 indicate the portion of the composite plate that is removed by each punching operation, a central opening 34 being provided therein for receiving the holding means 18 in the respective terminal plates.

It may be noted that the edge portions of the intermediate portions of the base metal 29 extend in parallel spaced relation to each other, by reason of the hereinbefore described construction and method of rolling, which comprised, as hereinbefore described, passing the same longitudinally of its length between suitable rollers to increase the width of the intermediate portion of the original bar 24 to a limited extent only, and to increase the length thereof to a relatively large degree, and reduce the thickness.

The device embodying my invention thus provides a relatively thin composite bar that has a contact portion of silver, of an appreciable depth, at the end portion thereof or that may be located at any intermediate portion of the contact plate, as may be desirable. In the particular application illustrated, it is necessary that the contact portions be at the ends thereof. The contact portion of the respective terminal plates are located in what may be termed either a shoulder portion, in the finished device or in a groove in the semi-finished device, which portion is of large depth relatively to the thickness of the supporting plate that is of base metal whereby a long life of the contact portion or portions is ensured.

Since various modifications and changes may be made without departing from the spirit and scope of the invention, I desire that only such limitations shall be placed thereon as are imposed by the prior art.

I claim as my invention:

1. The method of making contact terminals which comprises brazing a central and two side bars of a base metal with two intermediate bars of a highly-conducting metal, brazing the composite bar on a base metal bar, cold rolling the bar thus formed to a relatively thin elongated sheet, and punching contact terminals therefrom having spaced apart portions thereof of highly-conducting metal.

2. The method of making contact terminal members which comprises brazing together alternate bars of a base metal and a highly-conducting metal, brazing said composite bar on a base metal bar, subjecting all of said bars to repeated cold rolling and annealing operations to decrease the thickness and increase the length of said bar without substantially increasing the width thereof, and then so punching contact terminal members therefrom that spaced apart portions of the surface thereof will be of highly-conducting metal to constitute the contact surfaces.

3. The method of making contact terminal members which comprises brazing together alternate bars of a base metal and a highly-conducting metal, brazing said composite bar on a base metal bar, subjecting all of said bars to repeated cold rolling and annealing operations to reduce the thickness thereof to a predetermined value, and then punching contact terminal members therefrom, said terminals comprising a base portion of base metal and a top portion having an intermediate portion of base metal and end portions of highly-conducting metal.

4. The method of making contact terminals which comprises brazing a central and two side bars of a base metal with two intermediate bars of a highly conducting metal to form a composite bar, brazing the composite bar on a base metal bar, cold rolling the bar thus formed to a relatively thin elongated bar, and punching contact terminals therefrom, said terminals comprising a base portion, and a top portion having end portions of highly conductive metal and an intermediate base metal portion.

5. A contact terminal comprising a top portion having two side portions of highly conducting metal, said metal being substantially resistant to oxidation, and an intermediate portion of a base metal, and a bottom portion of base metal, all of said metals being united to form an integral compound metal member.

6. The method of making a composite bar which consists in permanently joining two bars of a highly conducting metal to a base metal, the highly conducting bars of metal being disposed on opposite sides of the base metal, similarly joining base metal bars on the free sides of the highly conducting metallic bars, and joining a base metal member to the bottom of all of the bars.

7. The method of claim 6, and in addition thereto, cold rolling the composite bar to a relatively thin elongated sheet.

8. The method of claim 6, and in addition thereto, cold rolling the composite bar to a relatively thin elongated sheet and punching out portions thereof.

9. A composite bar of metal comprising a central portion of base metal with a portion of highly conducting metal on each side of the central portion and a portion of base metal on each side of the highly conducting portion and a broad portion of base metal

in contact with all of the portions, the different metals being permanently joined together at their contact surfaces.

10. The bar of metal as described in claim 9 in which the highly conducting portions of metal are resistant to oxidation and corrosion.

11. A composite bar of metal comprising a central portion of base metal and alternate portions of highly conducting and base metal portions on each side of the central portion with a single supporting layer of metal for all the portions, the various elements being permanently joined together into one bar of metal.

12. A contact terminal conmprising two separated portions of highly conducting material each one having a side flanked by a portion of different material and all supported by another portion of material, all permanently joined together.

13. A contact terminal comprising two separated portions of highly conducting material with two portions of a different material so joined thereto that one portion of the latter material separates the first two named portions while the other portion of the latter material joins the first named two portions.

In testimony whereof, I have hereunto subscribed my name this 20th day of February, 1925.

LAURENCE K. MARSHALL.