N. CARRICO.

METHOD OF MENDING ELECTRIC RESISTANCE ELEMENTS.

APPLICATION FILED JAN. 22, 1921.

1,415,524. Patented May 9, 1922.

Fig. 1.

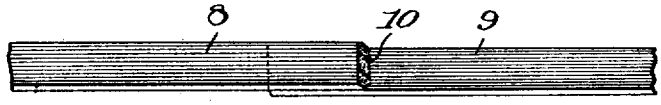


Fig. 2

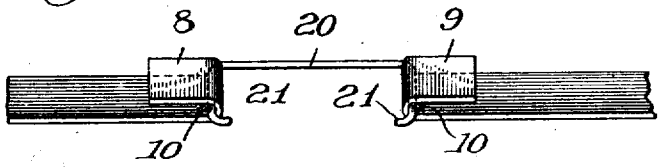


Fig. 3.

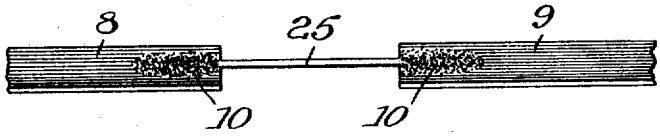


Fig. 4.

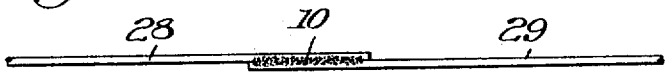


Fig. 5.

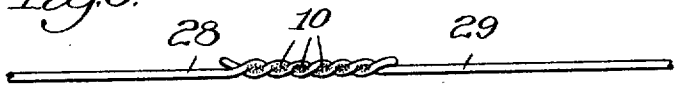


Fig. 6.

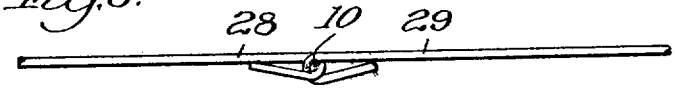
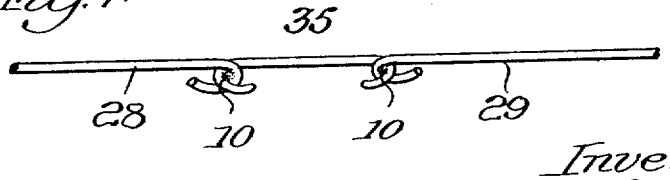


Fig. 7.



Inventor:
Noel Carrico,
By Dyrenforth, Lee, Christon & Wiles
Attys.

UNITED STATES PATENT OFFICE.

NOEL CARRICO, OF SIDNEY, MONTANA, ASSIGNOR OF ONE-HALF TO FRANK C. HUGHES, OF EVANSTON, ILLINOIS.

METHOD OF MENDING ELECTRIC RESISTANCE ELEMENTS.

1,415,524. Specification of Letters Patent. Patented May 9, 1922.

Application filed January 22, 1921. Serial No. 439,189.

To all whom it may concern:

Be it known that I, NOEL CARRICO, a citizen of the United States, residing at Sidney, in the county of Richland and State of Montana, have invented a new and useful Improvement in the Methods of Mending Electric Resistance Elements, of which the following is a specification.

This invention relates to improvements in mending electric resistance elements and applies more particularly to those metallic resistance elements commonly used for heating in electric heaters, flat irons, soldering irons and the like, which are made of a wire or ribbon or strand having a cross section of any shape; but not formed into a helix or spiral with convolutions.

It is well known that such an element sometimes becomes broken from misuse or unusual strains, or burns out at a thin or weak point, before the usefulness of the element as a whole has expired. By the use of my invention an element so broken can be quickly, easily and cheaply mended so as to restore its former usefulness, thus greatly prolonging its life.

In the accompanying drawings, I have illustrated the practice of my invention in several ways. In Figure 1 I have illustrated in perspective a ribbon element being mended by overlapping the broken ends. In Figures 2 and 3 I have shown, in perspective, two methods of mending a broken ribbon element where the ends are not overlapped. In Figures 4, 5, 6 and 7 I have shown three methods of mending a wire element.

As shown in Figures 1, 2 and 3, 8 and 9 indicate the broken ends of an electric resistance element made in the form of a ribbon, such as is commonly used in electric heaters, flat irons, soldering irons and the like. In the practice of my invention, the broken ends of the resistance element are overlapped as shown in Figure 1. A small amount of powdered borax is placed between the overlapped ends and some is placed adjacent the broken end 8 on the side of the end 9 as indicated by 10. The amount of borax placed between the broken ends is not sufficient to prevent a metallic contact from being made. If so much borax is placed between the ends as to prevent an electric circuit from being made, the two ends are squeezed together and rubbed slightly back and forth until enough of the borax has been forced out in order to restore an electrical contact. It is obvious, however, that a small amount of borax will remain between the two metallic surfaces. After the broken ends have been thus overlapped and borax put in place, the normal operating circuit customarily used through the resistance element is turned on, whereupon the broken overlapped ends will become united. In the practice of my invention I prefer to use partially dehydrated borax as it is more adherent, and by its use excessive intumescence is avoided. Although I have stated that I use borax, it is obvious that, without detracting from the spirit of my invention, other substances may be used instead. For example, any alkali similar to borax or any flux may be used.

In Figures 2 and 3 I have shown slightly different methods of mending a broken ribbon element. These methods are adapted for use where it is impossible or undesirable, for any reason, to overlap the ends of the broken element. As shown in Figure 2, the broken ends 8 and 9 of the element are bent back to form hooks, and a wire or piece of metal 20 is provided to bridge the gap. The ends 21, 21 of the bridging member 20 are bent to form hooks adapted to engage with the hooks formed in the broken ends of the resistance element. Powdered borax, as indicated by 10, is applied at the points of contact between the member 20 and the broken ends 8 and 9. When the parts are in position as shown in Figure 2, and the borax has been applied, the normal operating current customarily used through the resistance element is turned on, whereupon the ends of the bridging member 20 will become united to the broken ends of the resistance element. It is obvious that the member 20 must be an electrical conductor of proper resistance to carry the normal operating current without burning out.

In Figure 3 I have shown a method of practicing my invention in which the broken ends 8 and 9 of the resistance element are not overlapped and are not formed into hooks. In the practice of this method a bridging member 25 similar in all respects to the bridging member 20 shown in Figure 2 is provided, except that its ends are not bent. The bridging member 25 is laid in position as shown in Figure 3, with its ends overlapping the broken ends 8 and 9 of the

resistance element. Powdered borax, as indicated by 10, is applied at the points of contact, and the normal operating current is turned on.

In Figures 4, 5, 6 and 7 I have shown my invention as applied to the mending of broken wire resistance elements. In Figure 4 the broken ends of the wire, as indicated by 28 and 29, are overlapped. In Figure 5 they are shown twisted together. In Figure 6 each end is bent into a hook, and the two hooks are engaged. In Figure 7 the ends are bent into hooks and a bridging member 35 with its ends hook-shaped is provided to engage the two hooked ends of the element. In each of the methods illustrated in Figures 4, 5, 6 and 7, powdered borax, as indicated by 10, is applied at the points of contact similarly to the manner in which it is applied in the mending of ribbon elements. When the ends of the wire are in place and the borax has been applied, the normal operating current customarily used in the resistance element is turned on, whereupon the broken ends will become united with each other if they are in contact, or else to the ends of the bridging member. It is obvious that the bridging member indicated by 35 in Figure 7 must be an electrical conductor of proper resistance to carry the normal operating current customarily used through the resistance element.

At times the quantity of current flowing through the repair may be somewhat increased by short-circuiting some of the coils. However, by the use of my invention the element while in place in the mounting may be quickly repaired using the normal current, i. e., that reaching the device through its regular leads and without making any special connection. This is highly important particularly with heavy translators like domestic ranges which can be restored to usefulness without removing the element as has been heretofore required.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes therefore in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to claim all novelty inherent in my invention as broadly as possible in view of the prior art.

I claim:

1. The method of mending an electric resistance element in place in its mounting by bringing the broken ends in contact with the ends of a bridging member and passing through the element and said bridging member the current which normally operates the translator of which the element is a part.

2. The method of mending an electric resistance element in place in its mounting by bringing the broken ends in contact with the ends of a bridging member, applying a flux to the points of contact and passing through the element and said bridging member the current which normally operates the translator of which the element is a part.

In witness whereof I have hereunto set my hand and seal this 13th day of January, 1921.

NOEL CARRICO. [L. S.]