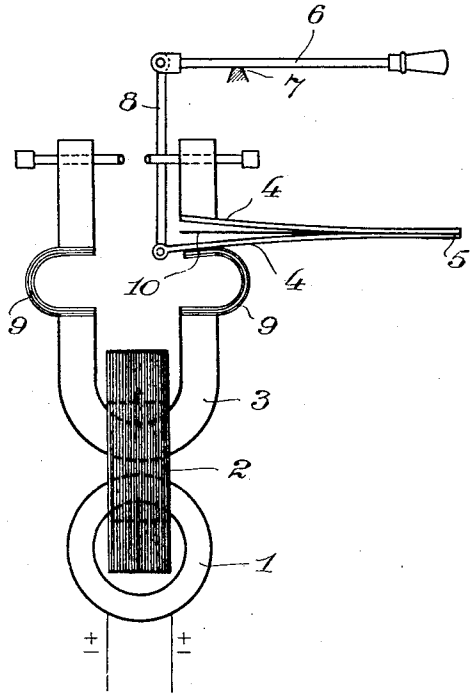
E. A. E. TÖRNBLOM.

ELECTRIC REGULATING RESISTANCE.

APPLICATION FILED OCT. 14, 1918.

1,306,085. Patented June 10, 1919.



Inventor
E. A. E. Törnblom
by Jno. Furniss
his Atty.

UNITED STATES PATENT OFFICE.

ERNST ALBERT EMANUEL TÖRNBLOM, OF ESKILSTUNA, SWEDEN.

ELECTRIC REGULATING RESISTANCE.

1,306,085. Specification of Letters Patent. Patented June 10, 1919.

Application filed October 14, 1918. Serial No. 258,090.

To all whom it may concern:

Be it known that I, ERNST ALBERT EMANUEL TÖRNBLOM, a citizen of Sweden, residing at Eskilstuna, Sweden, have invented certain new and useful Improvements in Electric Regulating Resistances, of which the following is a full, clear, and exact description.

My invention relates to such electric regulating resistances in which the resistance in an electric circuit may be varied continually by means of nearing two elastic contact surfaces toward each other or by removing them from each other. The invention is especially intended to be used for varying the current or the voltage in secondary mains and more particularly in electric welding and the like, but it may also be used for other purposes, especially when a uniform variation of the resistance is required.

In the following description of the invention reference is made of the accompanying drawing, in which a form of the invention used for welding purposes or the like is illustrated.

Referring to the drawing 1 represents the primary coil, 2 the iron core and 3 the secondary coil. In the circuit of the latter a resistance is placed consisting in a known way of two elastic elements 4 electrically connected with each other at one end. The two surfaces of these elements facing each other are plane when they are in contact with each other along their entire length. The elements 4 are, at one end 5, connected with each other by means of screws or the like and they are normally separated from each other on the remaining part of their length by being bent outward from each other. One (or both) of the opposite ends of the elements is connected with means for bringing these ends together and for separating them again. This device consists, in the form shown in the drawing, of a lever 6 pivoted at 7 and connected at one end by means of a rod 8 with the end of one of the resistance elements 4 while the end of the other element is connected with the part of the secondary mains that is intended to support the working piece to be welded. On the secondary coil conducting springs 9 are provided which allow a certain movement of the parts of the apparatus, and one of these springs is, at one end, connected with the one of the resistance elements that is connected with the rod 8. When the resistance elements are brought toward each other by means of the lever 6 their surfaces facing each other will coincide more and more from the end 5 until they are close together and the entire resistance is cut out. Thus all amounts of resistance between 0 and a maximum value can be obtained by one single manipulation.

In order to reduce the contact resistance as much as possible, when the current passes the surfaces of the elements 4 touching each other a band or a tongue 10 of another material is placed between the two elements 4 according to the present invention. This tongue may consists of copper if the elements 4 are made of iron, and it is placed in such a way that one of its ends is fastened at 5 while its other end projects freely between the elements 4. When these latter are caused to approach each other the current must pass through the intermediate tongue 10 that is brought into contact with them both more and more.

As the resistance elements 4 must be tempered or hardened in order to effect a certain pressure at the contact and still be able to resume their original form, they will be little apt to come into a very close contact with each other, *i. e.*, to offer a small resistance to the current. On the other hand the tongue 10, being made of copper or the like and thus comparatively soft, will follow the contact surfaces very closely and offer only a minimum of resistance to the current. It is also a good heat conductor and thus it abstracts very well the heat generated.

It is obvious that a resistance provided with a tongue of this type is able to stand much greater loads than a resistance without such a tongue and this is also shown by experiments.

While I have confined my description to but one form for applying the invention, it, of course, will be understood that it may be varied in several ways without departing from the spirit of my invention, all of which is included in the appended claim.

What I claim as new is:—

An electric regulating resistance comprising elastic elements with surfaces of contact facing each other and at one end connected

with each other, the opposite ends being connected with an electric circuit, a tongue, of another material than the elements, at one end fastened between the ends of said resistance elements where these are connected with each other and at the opposite end projecting freely between said elastic elements.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNST ALBERT EMANUEL TÖRNBLOM.

Witnesses:
KARL Y. SWANSON,
GRETA PRIEN.