Dec. 22, 1942. G. E. MEGOW ET AL 2,305,977

ELECTRICAL RESISTOR

Original Filed July 15, 1937

Fig. 1

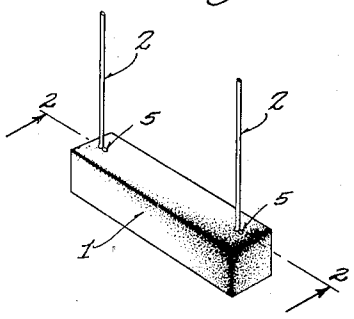


Fig. 2

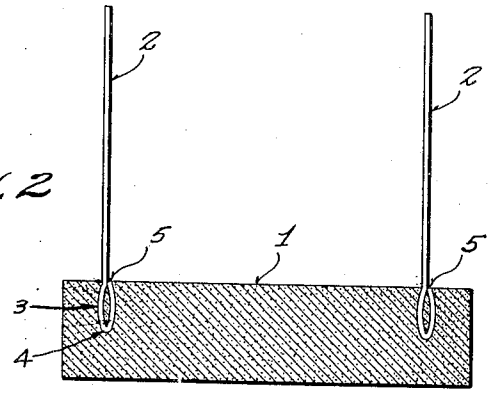
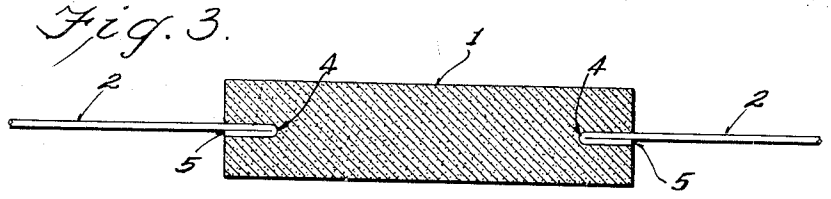


Fig. 3.



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Patented Dec. 22, 1942

2,305,977

UNITED STATES PATENT OFFICE

2,305,977

ELECTRICAL RESISTOR

George E. Megow, South Milwaukee, and Homer G. Thomson, Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis., a corporation of Wisconsin

Original application July 15, 1937, Serial No. 153,746. Divided and this application May 6, 1940, Serial No. 333,644

6 Claims. (Cl. 201—63)

The invention relates to an electrical resistor for use in relations in which constancy in resistance under wide variations in conditions is vital and essential.

The electrical resistor to which the invention applies in particular is of the type in which an electrical resistant body composed of a hardened plastic substance containing a comminuted conductive substance is provided at each end with an attenuated elongated terminal.

Such an electrical resistor has before presented difficulty in attaching the terminals to the resistant body in such a way as to maintain permanent intimate electrical and mechanical contact between the terminals and the resistant body under the conditions obtaining in practice.

The present invention has for its object to provide an electrical resistor in which permanent intimate electrical and mechanical contact will be maintained between the terminals and the resistant body.

Another object is to provide an electrical resistor in which the liability of intimate electrical and mechanical contact between the terminals and the resistant body becoming impaired under variations in temperature and other conditions in practice will be lessened.

Another object is to provide an electrical resistor in which constancy in resistance will be maintained between its terminals under repeated variations in temperature and other conditions in practice.

Another object is to provide an electrical resistor in which permanent intimate electrical and mechanical contact between the terminals and the resistant body may be readily obtained in manufacturing the resistor for practical and commercial use.

According to the present invention as it is embodied in practice, the electrical resistor is provided at each end with an attenuated elongated terminal in the form of a wire attached to the resistant body by being provided with an integral head having a rear transverse abutment forming a part thereof, the head is attached to the resistant body by being embedded in the resistant body entirely around its sides to bind it thereto in intimate electrical and mechanical contact therewith, and the rear abutment upon the head and the resistant body around the abutment are left exposed to lessen the liability of the intimate electrical and mechanical contact between the head and the resistant body and the constancy in the electrical resistance between the terminals becoming impaired under variations in temperature and other conditions in service.

The present application is a division of application Serial No. 153,746, filed July 15, 1937, now Patent No. 2,261,916, issued November 4, 1941.

The electrical resistors illustrated in the accompanying drawing exemplify embodiments of the invention, and the views in the drawing are as follows:

Fig. 1 is a perspective view of an electrical resistor provided with sidewise terminals.

Fig. 2 is a longitudinal section of the electrical resistor in Fig. 1 on line 2—2 thereof.

Fig. 3 is a longitudinal section of an electrical resistor provided with endwise terminals.

The electrical resistor is provided with a plastic resistant body 1 composed of a hardened plastic substance containing a comminuted conductive substance to constitute an electrical resistance.

The resistant body is provided at each end with an electrical terminal 2 in the form of a round wire or other attenuated elongated member protruding from the resistant body.

The electrical terminal is provided with a head 3 formed by a folded or refluxed end 4 upon the wire. The head is provided with a rear transverse abutment 5 formed by the extremity of the folded end of the wire.

The electrical terminal is attached to the resistant body by its head being embedded in the resistant body entirely around its sides to bind it in permanent intimate electrical and mechanical contact therewith.

The rear transverse abutment 5 upon the head and the resistant body around the abutment are left exposed.

The resistor is thus provided at each end with a terminal which is attached to the resistant body in such a way as to lessen the liability of the intimate electrical and mechanical contact between the head and the resistant body becoming impaired under variations in temperature and other conditions in service and thereby altering the fixed ohmic resistance of the resistance body between the terminals.

Fig. 3 shows the resistor in another form in which the resistant body 1 is provided at each end with an endwise terminal 2 arranged in longitudinal alinement with the resistant body and the other terminal.

The electrical terminal is provided with a head formed in the same way as before explained, but having straight sides instead of curved sides.

The terminal head may assume various other

forms and shapes to attain the end sought by the invention.

The resistor provided by the invention described herein lends itself to being readily made to obtain a predetermined ohmic resistance between its terminals and intimate electrical and mechanical contact between the terminals and the resistant body, as pressure may be applied at the same time direct to the abutment upon the head of the terminal and to the resistant body around the head to set the head in a definite position in the resistant body and compress the resistant body to a definite density throughout its entirety.

The invention explained and described herein may be embodied in different ways to attain the principles and characteristics thereof as defined by the claims hereinafter.

That which we claim as our invention and wish to secure by Letters Patent is:

1. An electrical resistor, comprising the combination with an electrical resistant body composed of a hardened plastic insulating substance containing a comminuted conductive substance and an attenuated elongated terminal protruding from each end of said resistant body and provided with an integral head embedded in said resistant body in direct electrical contact therewith, of a hardened plastic bond formed upon said resistant body entirely around said head and impinging upon its sides to hold said head in permanent intimate electrical and mechanical contact with said resistant body and said head at its rear end and said bond around said rear end being exposed to lessen the liability of said intimate electrical and mechanical contact between said head and said body becoming impaired under variations in temperature and other conditions in practice.

2. An electrical resistor, comprising the combination with an electrical resistant body composed of a hardened plastic insulating substance containing a comminuted conductive substance and an attenuated elongated terminal protruding from each end of said resistant body in axial alinement with said resistant body and the other terminal and provided with an integral head embedded in said resistant body in direct electrical contact therewith, of a hardened plastic bond formed upon said resistant body entirely around said head and impinging upon its sides to hold said head in permanent intimate electrical and mechanical contact with said resistant body and said head at its rear end and said bond around said rear end being exposed to lessen the liability of said intimate electrical and mechanical contact between said head and said body becoming impaired under variations in temperature and other conditions in practice.

3. An electrical resistor, comprising the combination with an electrical resistant body composed of hardened plastic substance containing a comminuted conductive substance, of an attenuated elongated terminal protruding from each end of said resistant body and provided with an integral head having a rear transverse abutment and embedded entirely around its sides in said plastic substance to bind said head to said resistant body in intimate electrical and mechanical contact therewith and said rear abutment upon said head and said resistant body around said abutment being exposed to lessen the liability of the intimate electrical and mechanical contact between said head and said body and the constancy in electrical resistance between said terminals becoming impaired under variations in temperature and other conditions in service.

4. An electrical resistor, comprising the combination with an electrical resistant body composed of a hardened plastic substance containing a comminuted conductive substance, of an attenuated elongated terminal protruding from each end of said resistant body in axial alinement with said resistant body and the other terminal and provided with an integral head having a rear transverse abutment and embedded entirely around its sides in said plastic substance to bind said head to said resistant body in intimate electrical and mechanical contact therewith and said rear abutment upon said head and said resistant body around said abutment being exposed to lessen the liability of the intimate electrical and mechanical contact between said head and said body and the constancy in electrical resistance between said terminals becoming impaired under variations in temperature and other conditions in service.

5. An electrical resistor, comprising the combination with a plastic resistant body composed of a hardened plastic substance containing a comminuted conductive substance, of an attenuated elongated terminal in the form of a wire protruding from each end of said resistant body and provided with an integral head formed by a folded or reflexed end upon said wire and having the extremity of said reflexed end forming a rear transverse abutment upon said head, said head being attached to said resistant body by being embedded in said resistant body entirely around its sides in intimate electrical and mechanical contact therewith and said rear abutment and said resistant body around said abutment being left exposed to lessen the liability of the electrical and mechanical contact between said head and said resistant body and the constancy in the electrical resistance between said terminals becoming impaired under variations in temperature and other conditions in service.

6. An electrical resistor, comprising the combination with a plastic resistant body composed of a hardened plastic substance containing a comminuted conductive substance, of an attenuated elongated terminal in the form of a wire protruding from each end of said resistant body in axial alinement with said resistant body and the other terminal and provided with an integral head formed by a folded or reflexed end upon said wire and having the extremity of said reflexed end forming a rear transverse abutment upon said head, said head being attached to said resistant body by being embedded in said resistant body entirely around its sides in intimate electrical and mechanical contact therewith and said rear abutment and said resistant body around said abutment being left exposed to lessen the liability of the electrical and mechanical contact between said head and said resistant body and the constancy in the electrical resistance between said terminals becoming impaired under variations in temperature and other conditions in service.

GEORGE E. MEGOW.
HOMER G. THOMSON.

CERTIFICATE OF CORRECTION.

Patent No. 2,305,977. December 22, 1942.

GEORGE E. MEGOW, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, lines 18 and 19, for "That which we claim as our invention and wish to secure by Letters Patent is:" read --The invention herein shown and described is hereby claimed as follows:--; and line 61, claim 3, before "hardened" insert --a--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of February, A. D. 1943.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.

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