June 30, 1942. A. A. FOLEY 2,288,235

ADJUSTABLE BAND RESISTOR

Filed Sept. 14, 1940

Fig. 1.

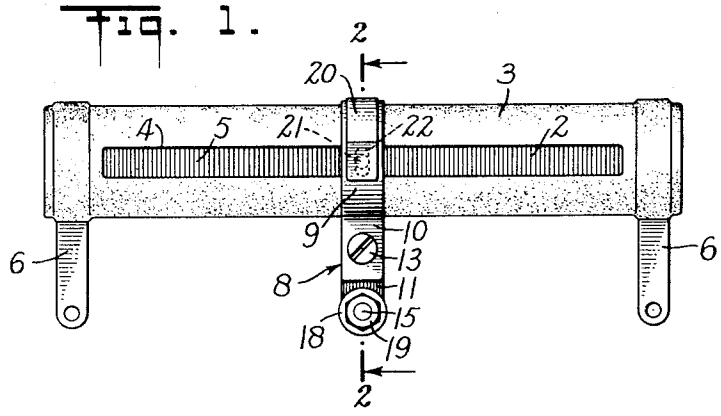


Fig. 2.

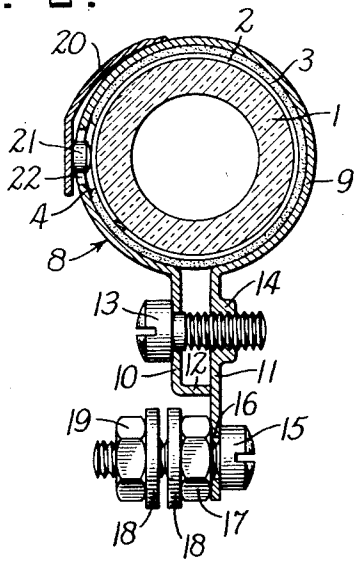


Fig. 3.

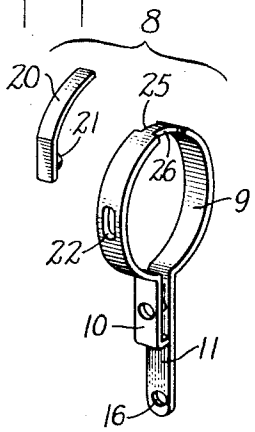
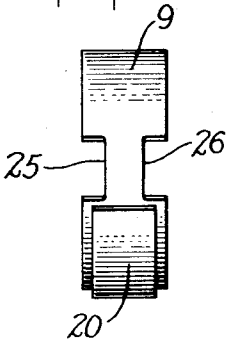


Fig. 4.



INVENTOR
Andrew A. Foley
BY
Blair, Curtis & Hayward
ATTORNEYS

Patented June 30, 1942 2,288,235

UNITED STATES PATENT OFFICE

2,288,235

ADJUSTABLE BAND RESISTOR

Andrew A. Foley, Camden, N. J., assignor to International Resistance Company, Philadelphia, Pa., a corporation of Delaware

Application September 14, 1940, Serial No. 356,720

5 Claims. (Cl. 201—63)

This invention relates to the manufacture of adjustable electrical resistors and more particularly to an improved adjustable contact device and terminal for such a resistor.

One of the objects of this invention is to provide a terminal structure for a resistor or the like which will be simple, practical and durable. Another object is to provide a construction of the above character which may be made from inexpensive materials and at low labor cost. Another object is to provide a terminal structure capable of easy adjustment to different positions along the length of a resistor unit. Another object is to provide a structure of the above character which may be easily secured in any allotted position on the resistor at the same time assuring an adequate electrical connection with that portion of the resistor. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing in which is shown one of the various possible embodiments of my invention:

Figure 1 is a general view of an adjustable resistor;

Figure 2 is an enlarged vertical section taken along the line 2—2 of Figure 1;

Figure 3 is an exploded perspective view of certain of the parts of the clamping band and contact support; and

Figure 4 is a top plan view on an enlarged scale of the clamping band.

This application is a continuation-in-part of my copending application Serial No. 323,098, filed March 9, 1940, entitled Adjustable band resistor.

As conducive to a clearer understanding of this invention it might here be pointed out that it is desirable under certain circumstances to provide an adjustable terminal for an adjustable resistor or the like. Often it is convenient to tap such a resistor and the exact point of such tap cannot be determined until installation, thus making it necessary to provide some structure which may be easily adjusted to different positions along the length of an adjustable resistor. In the past, such adjustable terminal structures have been open to certain operating deficiencies making them inconvenient to use and unreliable in operation. Many of these adjustable terminals are characterized by a band portion extending about the body of the resistor, and provision for tightening this band. However, the tightening of the band to fix it at any given location on the resistor often causes distortion which may result in an unstable electrical connection between the terminal and the resistor. Another object of this invention is to provide a construction in which the above-mentioned difficulties as well as many others are successfully and efficiently overcome.

Referring to the drawing, and particularly to Figures 1 and 2, there is shown a resistor preferably comprising a tubular ceramic core 1 having resistance wire 2 helically wound thereon and covered by a suitable insulating and mechanically protective coating 3 such as cement, vitreous enamel, or the like. As shown in Figure 1, the coating 3 is provided with a narrow longitudinal slot 4 forming an exposed portion 5 of the resistance wire 2. At its ends the resistance wire 2 is electrically connected to the fixed terminals 6, whereby the resistor may be connected to and incorporated in an electrical circuit.

Intermediate the fixed terminals 6 there is an adjustable contact device and terminal, generally designated by the numeral 8 and comprising a metal band 9 which passes around the resistor and, as shown in Figure 2, terminates in two downwardly extending arms 10 and 11. Arm 10 is provided with a right angle lip or projection 12 which bears against the arm 11 as shown. To hold the arms of the clamping band 9 together and to tighten the band on the resistor, there is provided between lip 12 and the resistor a screw 13 which passes through a hole in the arm 10 and threads into a built up section 14 of arm 11.

Arms 10 and 11, lip 12, and screw 13 cooperate to reduce the possibility of distortion of band 9 about the resistor during tightening of the screw; lip 12 acts as a fulcrum and the arms 10 and 11 act as levers in transmitting the pressure exerted by the screw 13 to the main circular portion of the clamping band 9, and consequently the force tending to tighten the band on the resistor is always exerted in a direction approximately tangential to the surface of the resistor. Thus, with this construction, there is appreciably less chance of distorting the band when the screw 13 is tightened.

At its lower end, the arm 11 is provided with an electrical terminal comprising a bolt 15 which passes through a hole 16 in the arm, and is held in place by a nut 17. The end of a wire or other electrical conductor leading to an external circuit may be held between two washers 18 carried on the bolt 15, and held in place by a lock nut 19.

Electrical contact with the resistance wire 2 is effected through a resilient metal strip 20 secured at one end, preferably by spot welding, to the outer surface of metal band 9. At its other end, strip 20 supports a contact button or point 21 also preferably affixed by spot welding and made of a non-corrosive conductive mate-

rial such as silver. The contact button passes through an oval aperture 22 (see Figure 3) in the band 9 to engage the resistance wire 2 and exerts on the exposed portion 5 thereof radial pressure, the magnitude of which is determined not by the tightness of the metal band 9 about the resistor, but by the tension of resilient strip 20. Thus the pressure which the contact button exerts on the resistance wire 2 is substantially independent of the tightness of the clamping band 9. As shown in Figures 2 and 3, the strip 20 at its contact supporting end may be slightly flattened to provide substantially perpendicular pressure against resistance wire 2 and a consequent better electrical connection therebetween.

From the above description, it is apparent that in the present invention the pressure exerted by the contactor on the resistance wire is determined by the resilient characteristics of the strip 20. Thus this pressure will not be too large, so as to break or distort the resistance wire; nor too small, so as to cause inadequate electrical connection. Consequently the efficiency of the resultant electrical connection is not dependent upon the skill of the installer—overtightening or undertightening of the clamping band will have substantially no effect on the pressure which the contact exerts. Moreover, the tendency of the clamping band to distort about the resistor will be appreciably reduced.

In certain instances, it is desirable to place the clamping band upon the resistor by spreading arms 10 and 11 and then passing the resistor between them. When the arms are spread, deformation of the band takes place, and, in order to prevent such deformation from disturbing the relative positions of strip 20 and band 9, a pair of notches 25 and 26 (Figures 3 and 4) are cut in the edges of the band preferably at the top thereof. The band is weakened by these notches a greater amount than by aperture 22, and thus, when the arms are spread, the band is deformed or bends in that portion of the band between notches 25 and 26. Thus, when the band is placed upon the resistor by spreading arms 10 and 11, the deformation thereof is concentrated at a given point, and accordingly, the relative positions held by strip 20 and band 9 before the band is bent are maintained during the placing the clamping band upon the resistor to assure a good electrical connection between button 21 and wire 2.

Accordingly, it will be seen that I have provided a thoroughly practical terminal structure for a resistor or the like in which the several objects hereinabove referred to, as well as many others, are successfully and practically accomplished.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In resistor construction, in combination, a resistor, a bendable clamping band of substantially the same general shape as the cross section of said resistor, said clamping band when applied to said resistor fitting firmly thereabout and exerting pressure thereon, and a contact member resiliently mounted on said clamping band, the contacting portion of said contact member resiliently engaging the resistance element of said resistor, whereby the contacting portion of said contact member exerts a pressure on said resistance element substantially independent of the pressure exerted on said resistor by said clamping band.

2. In resistor construction, in combination, a resistor, a bendable clamping band of substantially the same general shape as the cross section of said resistor, said clamping band when applied to said resistor fitting firmly thereabout and exerting pressure thereon, a resilient strip anchored at one end to said clamping band, and a contact normally in engagement with the resistance element of said resistor mounted on the other end of said strip, said resilient strip forming the only connection between said clamping band and said contact, whereby said contact exerts a pressure on said resistance element substantially independent of the pressure exerted by said clamping band on said resistor.

3. In resistor construction, in combination, a resistor, a bendable clamping band of substantially the same general shape as the cross section of said resistor, said clamping band when applied to said resistor fitting firmly thereabout and exerting pressure thereon, said clamping band being adjustable longitudinally of said resistor and having an aperture formed therein, a resilient strip mounted on the outside of said clamping band and having one end anchored thereon, and a contact normally engaging the resistance element of said resistor through said aperture mounted on the other end of said strip, said resilient strip forming the only connection between said band and said contact, whereby said contact exerts a pressure on the resistance element of said resistor substantially independent of the pressure exerted by said clamping band on said resistor.

4. An adjustable resistor comprising, in combination, a core, a resistance wire wound thereon, a non-conductive coating covering said resistance wire, said coating having a longitudinal slot exposing a portion of said wire, a metallic clamping band passing around said resistor and terminating in two outwardly extending arms, a contact mounted on said band resiliently engaging said exposed portion of said resistance wire, a lip formed on one of said arms and engaging the other of said arms, adjustable tightening means for said clamping band interposed between said lip and said resistor, said tightening means and said lip cooperating with said arms to prevent appreciable distortion of said band during the tightening thereof.

5. In resistor construction, in combination, an elongated resistor, a metal clamping band extending around said resistor, said band being adjustable longitudinally of said resistor and having an aperture formed therein, an electrical contact member resiliently mounted on the outside of said band and contacting the resistance element of said resistor through said aperture, and means securing the ends of said band together to hold said band in said position on said resistor, said band having a cut-out portion spaced from said contact member and adapted to weaken said band a greater amount than said aperture does, whereby, when the ends of said band are separated, deformation of said band takes place at the point in said band weakened by said cut-out portion.

ANDREW A. FOLEY.

CERTIFICATE OF CORRECTION.

Patent No. 2,288,235. June 30, 1942.

ANDREW A. FOLEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 49, after "placing" insert --of--; and second column, line 32, claim 3, for "thereon" read --thereto--; 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 1st day of December, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)

CERTIFICATE OF CORRECTION.

Patent No. 2,288,235. June 30, 1942.

ANDREW A. FOLEY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, first column, line 49, after "placing" insert --of--; and second column, line 32, claim 3, for "thereon" read --thereto--; 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 1st day of December, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)