July 11, 1933. V. G. APPLE 1,918,078

RESISTOR ELEMENT

Filed Jan. 27, 1930

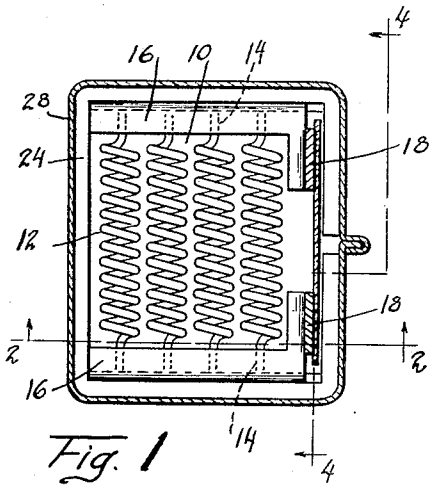
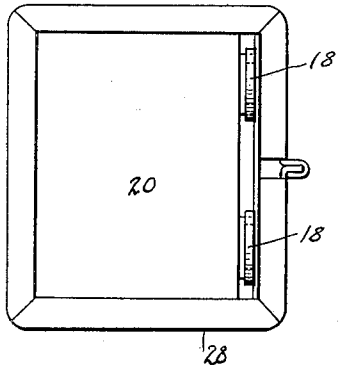


Fig. 1

Fig. 3



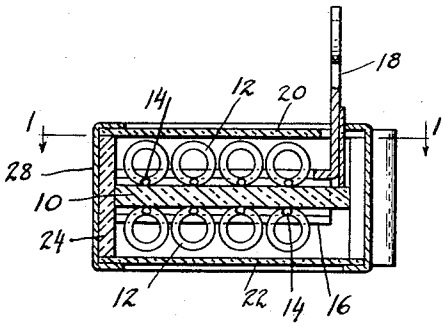


Fig. 2

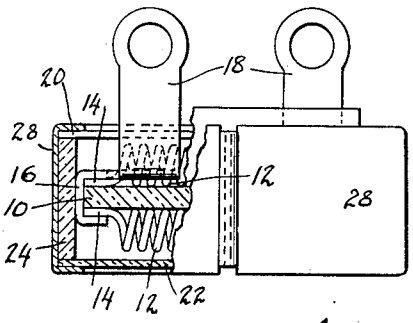


Fig. 4

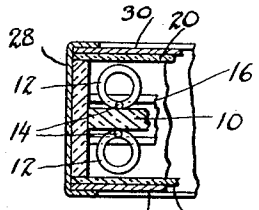


Fig. 6

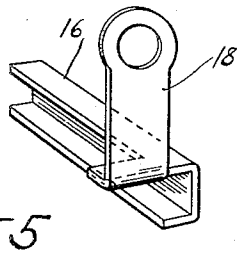


Fig. 5

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UNITED STATES PATENT OFFICE

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RESISTOR ELEMENT

Application filed January 27, 1930. Serial No. 423,642.

My invention relates to a resistor element, and has particular reference to that type of resistance unit which utilizes a plurality of resistance coils to constitute the resistance.

An object of my invention is to provide a resistor of simple, rugged, and economical construction which is capable of handling a large range of amperage.

Still another object of my invention is to construct such a unit of relatively few parts, and to so assemble these parts that the use of screws, or nuts and bolts for the purpose of securing the various parts together are unnecessary. In this way I permit a speedy assembly of the parts, and render the matter of replacement or repair extremely simple.

Still other objects and meritorious features of my invention will become apparent from the following description taken in conjunction with the drawing wherein like numerals refer to like parts throughout the several figures and wherein:

Fig. 1 is a cross section taken inside the cover plate along the line 1—1 of Fig. 2,

Fig. 2 is a cross section through the center between the terminals, along line 2—2 of Fig. 1,

Fig. 3 is a plan view of the unit assembled,

Fig. 4 is an end view, partly broken away along line 4—4 of Fig. 1 for the sake of clearness,

Fig. 5 is a perspective of my terminal plate, and

Fig. 6 is a somewhat modified cover plate assembly.

In the figures the numeral 10 represents an insulation plate which functions as a spacer for my resistance coils 12. This insulation plate may be of asbestos board or any other desired heat resisting material.

Each of my resistance coils 12 is composed of resistance wire shaped into a helical spring coil, the ends 14 of which are flattened down upon the corresponding ends of my insulation plate 10.

The ends of these coils are clamped in place along the edges of the plate 10 by means of terminal plates 16, the structure of which is clearly illustrated in Fig. 5 of the drawing. This clamping down operation may be done in any fashion, and while it is quite possible to produce satisfactory results by performing the operation manually, a machine of suitable design is preferable.

As will be noted from Fig. 5 each of these terminal plates is provided with an extension 18 which is designed to extend outside the resistor housing for purposes hereafter described.

The housing comprises upper and lower base plates 20 and 22 which are seated upon the side wall plate 24 extending around the inside of the side plate 28. These wall plates 20—26 are made of suitable wear resisting insulation material such as hard rubber or ebonite.

As clearly indicated in Fig. 2 the side plates 28 are folded down over the longitudinal edges of plates 20 and 22 for the purpose of holding the assembly firmly together. The upper base plate 20 is provided with a slot through which the extensions 18 of my terminal plates 16 extend. These terminal plates may be utilized to hook in the resistor element in circuit, directly, or may be secured to an electric switch such as I have described and claimed in copending application Serial Number 423,641, filed Jan. 27, 1930.

In Fig. 6, I have illustrated a somewhat modified structure wherein the metal plates 30 and 32 are superimposed upon the upper and lower base plates 20 and 22. When these plates are utilized, it is unnecessary that the plates 20 and 22 be of wear resisting material. It is simply necessary that they provide the proper insulation qualities and the outer metal cover plates 30 and 32 will function to resist all wear.

Various other modifications will become apparent to those skilled in the art and for that reason I intend to limit myself only within the scope of the appended claims.

I claim:

1. A resistor comprising a plurality of resistance coils extending parallel to one another and lying within a plane, a dupli-

cate plurality of such coils lying in a plane parallel to the first and spaced therefrom by an insulation plate, and terminal plates clamping the respective ends of each plane of coils against the insulation plate.

2. A resistor comprising a plurality of resistance coils extending parallel to one another, an insulating plate spacing said coils, terminal plates clamping the respective ends of said coils against opposite sides of said plate, and a housing surrounding said coil and plate assembly, said housing being insulated therefrom, said terminal plates having portions extending therethrough.

3. A resistor comprising a plurality of resistance coils extending parallel to one another and lying within a plane, a duplicate plurality of such coils lying in a plane parallel to the first and spaced therefrom by an insulation plate, terminal plates clamping the respective ends of each plane of coils against the insulation plate, and a housing surrounding said coil and plate assembly, said housing being insulated therefrom, said terminal plates having portions extending therethrough.

4. A resistor comprising a housing, an insulation lining therefor, an insulation plate snugly engaging the lining of the side walls of the housing and dividing the same into two compartments, a plurality of parallel helical resistance coils extending along each side of said plate, terminal plates clamping the respective ends of the coils against the sides of the insulation plate, said terminal plates having ears extending through said housing.

5. In combination with a resistor, an insulation plate, a pair of resistance coils arranged in superimposed relation along each side of said plate, the ends of said coils at each end thereof extending longitudinally along the plate and in contact therewith, and channel shaped units extending respectively along opposed ends of said plate adapted to clamp the ends of each of said coils to its respective face of the plate.

6. A resistor element including, in combination, an insulation plate having resistance coils arranged in superimposed relation upon each side thereof, means for securing said coils to said plate along opposite edges thereof, said means including terminal facilities, individual insulation plates arranged to form a rectangular casing about said coil assembly, and a flanged strap extending around the walls of the casing so formed, the flanges of said strap being adapted to position the assembly against relative movement.

7. A resistor unit including in combination an insulation plate, a pair of resistance coils extending along each side of said plate and having straightened ends lying in juxtaposition to said insulation plate, and a metallic channel shaped unit clamping said ends against the opposite faces of said plate, said channel shaped unit including an offset terminal flange extending at an angle to the length of said channel.

In testimony whereof, I VINCENT G. APPLE, sign this specification.

VINCENT G. APPLE.