

H. F. PRENZLOW.  
ELECTRIC RESISTANCE UNIT.  
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1,401,186.

Patented Dec. 27, 1921.

*Fig. 1.*

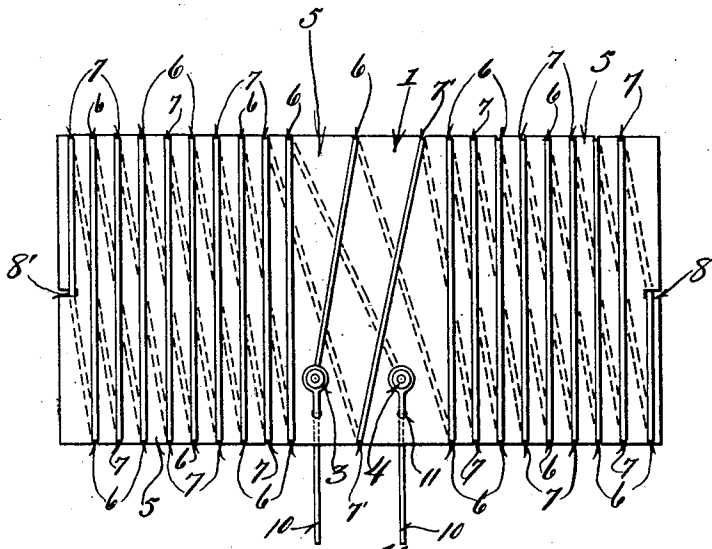
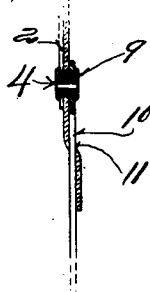


*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

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## ELECTRIC RESISTANCE UNIT.

1,401,186.

Specification of Letters Patent.

Patented Dec. 27, 1921.

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*To all whom it may concern:*

Be it known that I, HERMAN F. PRENZLOW, a citizen of the United States, and resident of Johnson Creek, in the county of Jefferson and State of Wisconsin, have invented certain new and useful Improvements in Electric Resistance Units; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in electrical apparatus, and pertains particularly to an electrical resistance unit and the method of forming the same.

The primary purpose of the invention is to provide a simply constructed resistance unit which can be very inexpensively manufactured and one which will be very efficient in operation.

In the disposition of resistance units in stoves and other electrical heating appliances, a more effective assembling can be obtained if the terminals of the unit are relatively close together. Heretofore it has been impossible to arrange the terminals of a heating unit close together without crossing the resistance wire and consequently insulating the same. Therefore it is also an important object of this invention to provide a resistance unit in which the terminals are relatively close together, while the resistance wire is wound in such a manner that its convolutions do not engage. It is not therefore necessary to insulate the resistance wire.

Still another object of the invention is to provide a resistance unit, the terminals of which are so mounted that the ends of the resistance wire may be easily and positively secured thereto, the lead-wires being also connected therewith in such a manner that movement of the parts thereof adjacent the terminals is prevented.

With these and other objects in view the invention consists in the novel features of construction, combination and arrangement of parts which will hereinafter be more particularly described and claimed. In the accompanying drawing:

Figure 1 represents a plan view of a resistance unit constructed in accordance with my invention.

Fig. 2 is a detail transverse sectional view showing the manner of securing one of the lead-wires to a terminal.

In the present application I have merely illustrated an electrical resistance unit of

improved design without attempting to show any arrangement for using the same, and it is understood that this invention is capable of being associated with various types of electrical appliances wherein resistance or heating units are necessary. Various forms and sizes may be therefore constructed to accommodate the invention for different uses without departing from the principles or sacrificing any of the advantages thereof.

The preferred embodiment of the invention comprises a substantially rectangular form 1 consisting of a plate of mica or other insulating material, a resistance wire 2 being wound therearound and having its opposite ends connected with terminals 3 and 4 respectively. From Fig. 1 it will be seen that these terminals 3 and 4 are disposed in spaced apart relation adjacent one longitudinal edge of the form 1 and substantially mid-way the ends thereof. By such an arrangement the resistance unit may be more readily associated with different types of heating appliances.

The end portions 5 of the form 1 have their opposite side edges provided with spaced notches 6 and 7, the same being arranged alternately with respect to each other. These notches 6 and 7 are formed relatively close together, whereas the intermediate portion 5' of the form 1 has similar notches 6' and 7', but the same are spaced considerable distances apart. One end edge of the form has a notch 8 positioned mid-way the side edges; the opposite end has a notch 8' located in relatively the same position.

In winding a resistance wire on the form 1, one end of the same is secured to the terminal 3, then passed across one face of the form to the notch 6' in the upper side edge thereof, thence across the other surface of the form to the notch 6 in the lower edge of the form, the wire being then continuously wound into the notches 6 until the end of the form is reached. This winding has been in the same direction from the terminal 3 to the end of the form, so in order to reverse the direction of winding, the wire is disposed through the notch 8 to the notch 7 in the upper side edge and thence around the form in the several notches 7 back to the notch 7' in the upper edge. By this arrangement the convolutions disposed in the notches 7 are located in between the several convolutions positioned in the notches 6.

After the right hand half of the form 1 has been wound with the wire 2, the latter is extended from the upper notch 7' to the lower notch 7', and from there to the innermost notch 7 in the upper side edge of the left hand portion of the form. The notches 7 in this part of the form are then occupied by the resistance wire by winding the same therearound until the end is reached whereupon the direction of winding is changed as at the opposite end by disposing the wire through the notch 8'. On the return of the wire from this end in which the notch 8' is formed, the notches 6 are occupied, the unattached portion of the wire being extended from the innermost notch 6 in the upper side edge of the form to the terminal 4.

By this arrangement a single resistance wire having its ends secured intermediate the ends of a form can be wound therearound from one end to the other without having any of its many convolutions touch one another. Thus the resistance wire may be uninsulated except by spacing the several convolutions apart. A not only cheap resistance unit may be obtained in this manner but one which will be extremely efficient in operation and one which is easy to assemble with other parts of electrical appliances.

The improved terminals 3 and 4 which are used with this unit and which form a part thereof are shown particularly in Fig. 2, wherein it will be noted that each consists of an eyelet 9 disposed from a hole in the form 1, having its ends upset to secure the ends of the resistance wire 2 to the ends of the lead-wires 10. In view of the nature of such terminal, it would, under certain conditions tend to rotate, therefore in order to obviate this I extend the lead-wire 10 at-

tached thereto through an opening 11 in the form 1.

I claim:

1. An electrical unit comprising a rectangular form of insulating material having its opposite edges provided with a series of spaced notches, each end having a single notch, a pair of terminals on the form near the center thereof, and a resistance wire having one end connected with one terminal and extending therefrom in spires through alternate notches to one end notch, continuing in spires midway between the first mentioned spires and continuing to the other end notch and thence back to the other terminal, said spires from one terminal to the other circumscribing the form continuously in the same general direction and at no point crossing each other on the same side of the form, the two ends of the wire being connected to the terminals at opposite sides of the form.

2. An electrical unit comprising a thin rectangular form of insulating material, a pair of terminals thereon intermediate the ends thereof, and a resistance wire having one end connected with one of the terminals and its opposite end with the other terminal, said wire being wound continuously around the form in one direction from one terminal to one end of said form thence to the opposite end, thence back to the other terminal, the spires leading from one end of the form to the other alternating with the spires of the other portions of the wire and nowhere crossing the same.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

HERMAN F. PRENZLOW.