Dec. 17, 1940. A. A. CADWALLADER 2,225,030

RESISTOR

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Fig. 1

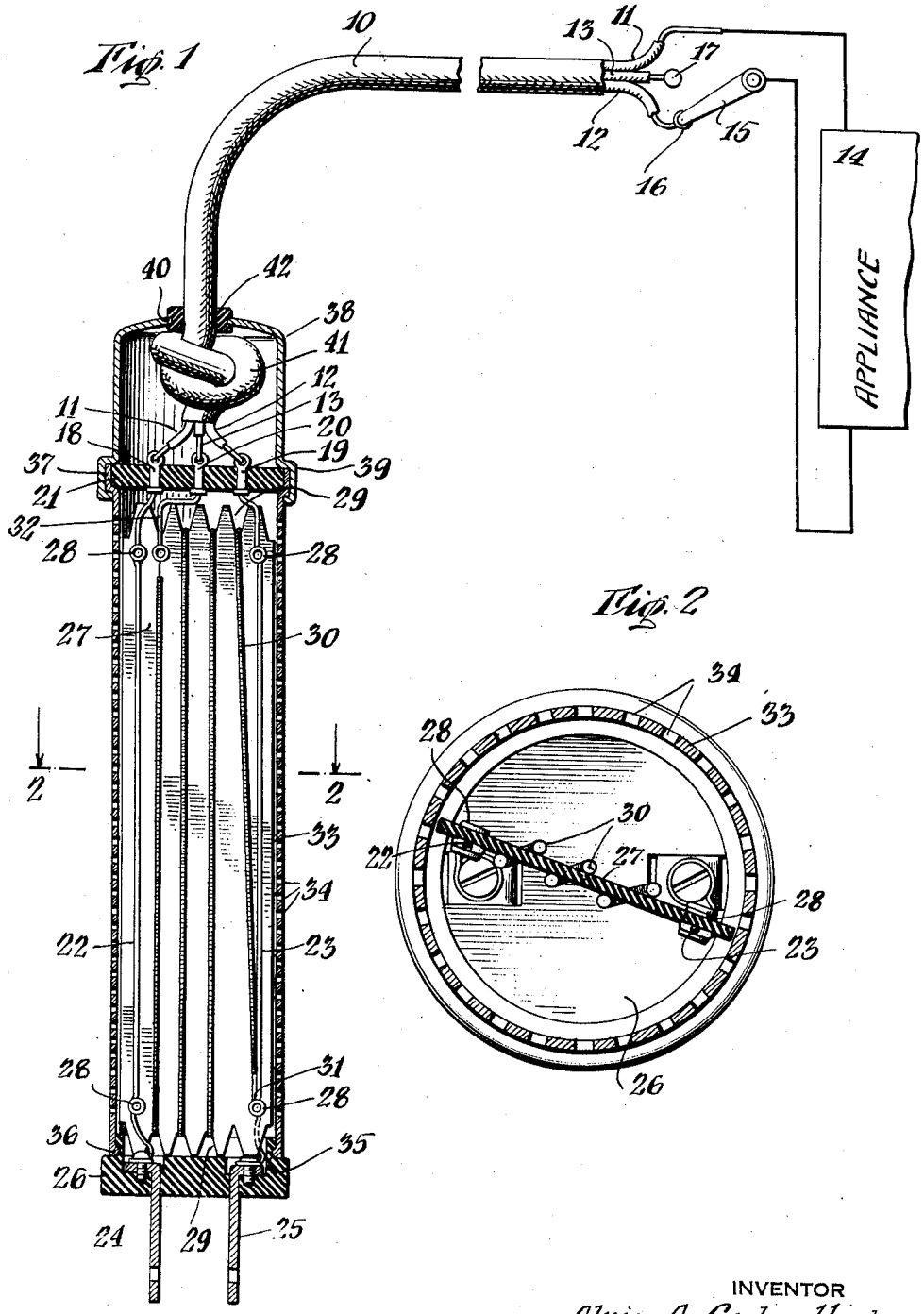


Fig. 2

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RESISTOR

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2 Claims. (Cl. 201—48)

This invention relates to an improved voltage dropping resistor and is particularly adapted for use in connection with household appliances of various types.

It is an object of the invention to produce a resistor which will be incorporated in the supply line circuit of the appliance preferably to the plug end thereof, and which will enable such appliance to be utilized interchangeably on circuits of different voltages.

Another object of the invention is to provide a resistor of this type for use in connection with appliances or apparatus the electrical circuits of which require several voltage values for their operation.

A further object is that of providing a device of this type in which the heat dissipated in the operation of the resistor is far removed from the appliance in conjunction with which it is being utilized, and so does not adversely affect the ready handling of the appliance or its operation.

In addition, it is an object of the invention to provide a resistor of this type which can be readily manufactured at low cost by automatic machinery and which will function over long periods of time in a safe and efficient manner.

With these and other objects in mind reference is had to the attached sheet of drawings in which:

Fig. 1 is a longitudinal cross-section of one form of resistor embodying my invention; and

Fig. 2 is a transverse cross-sectional view of the device illustrated in Fig. 1 taken at the point 2—2 in Fig. 1 and in the direction of the arrows appearing therein.

In these views there is illustrated the conventional service cord 10 which may be of any desired length and which in the form illustrated in the drawing embraces three independently insulated conducting wires 11, 12, and 13, these in turn being covered by a common outer covering which may be of cloth, rubber, or any other suitable material. Associated with one end of the service cord may be any desired electrical appliance 14 adapted to be operated from the electric current supplied it through such service cord. In addition a switch 15 operating across terminals 16 and 17 may be interposed in one leg of the circuit coming from the appliance so that circuit may be supplied to the appliance through the conducting wires 11 and 12 or through the wires 11 and 13, depending on the position of the switch 15.

It is of course apparent at this point that the switch 15 may take the form of any of the many well-known types of switches now on the market, and that if desired the service cord 10 may embrace any further number of conducting wires than the three illustrated. Likewise, if the electrical circuit of the particular appliance in use so demanded, current might be supplied to the appliance simultaneously through the conducting wires 11 and 12, 11 and 13, 12 and 13, and 11, 12, and 13.

At the other end of the service cord 10 we find that the ends of conducting wires 11, 12, and 13 are secured to the terminal posts 18, 19, and 20, all of which are in turn imbedded in a circular disk 21 which is preferably of an insulating material such as Bakelite, fiber, or the like, and which, in all events, mounts said terminals in such fashion that they are insulated each from the others.

The terminals 18 and 19 are in turn connected by means of conducting wires 22 and 23 to the inner surfaces of the two prongs 24 and 25 of a conventional base plug such as is commonly used in conjunction with a wall receptacle for securing electrical contact with the same. The prongs of the base plug are in turn mounted on a disk 26 which again is preferably of insulating material such as Bakelite, hard rubber, fiber, or other suitable material and, in all events, maintains the prongs in fixed position and insulated from each other. Underlying the conducting wires 22 and 23 is a sheet of material 27 preferably also of insulating material such as mica, or the like, and to which the conducting wires 22 and 23 are secured at their ends by means of the rivets 28.

In this connection it will be pointed out that the conducting wires or bus leads 22 and 23 are of sufficiently low ohmage to transmit electric current therethrough with substantially no voltage drop so that the conducting wires 11 and 12 to which they are joined in turn receive and transmit to the appliance the same voltage that is picked up from the wall receptacle by the prongs 24 and 25.

The sheet 27 is provided at each of its longitudinal edges with a series of notches 29 which in turn form retaining means about which can be wound in spaced non-contacting relationship a length of resistance wire 30. This resistance wire may, for example, be joined at 31 to one leg of the electric current and at its opposite end can be electrically connected through the medium of a coupling wire 32 to the terminal 20 where it in turn is joined to the conducting wire 13.

Encircling the unit is a metallic shell 33 formed with a series of perforations 34 over its entire surface. This shell cooperates with a shoulder 35 formed in the disk 26 and may be secured thereto by striking over portions of the peripheral edge of the shell into undercut spaces in such shoulder of the disk 26 as, for example, at 36. At its opposite end the shell is formed with a widened portion as at 37 which cooperates with the disk 21 and forms a seat therefor.

A secondary shell 38 also preferably of metal is provided to cover the upper end of the unit and affords protection to the terminals 18, 19, and 20. This secondary shell is in turn curled over the upper end of the first shell as at 39. It is also formed with a central opening 40 at its upper end through which projects the service cord 10. This service cord in turn can be secured by means of a knot 41 of larger cross-section than the opening 40 so as to prevent any strain being put on the connections between the conducting wires 11, 12, and 13 and the respective terminals 18, 19, and 20. Likewise, a rubber grommet 42 can cooperate with the opening 40 to seal the same and prevent the ingress of undesired elements.

It will be appreciated that instead of the circuit traced by the resistance wire 30 in the embodiment illustrated, that any suitable number of taps could be taken from this resistance wire and in turn coupled to additional conducting wires incorporated in the service cord 10. Likewise, it will be apparent that any desired value can be given to the resistance of the wire 30 and which will conform with the particular needs of the appliance with which the resistor is to be utilized.

In operation, and if the resistor is, for example, to be used with an appliance rated for 110 volt operation, the resistor if plugged into a wall receptacle furnishing 110 volt current would supply such current directly through the prongs 24 and 25, the conducting wires 22 and 23, and the conducting wires 11 and 12, to the terminal 16 and switch member 15 to the appliance. Should the same appliance be used in an electric line supplying 220 volts, by turning the switch 15 to contact the terminal 17, current would be supplied to the appliance through the prong 24, conducting wires 22 and 11 and the prong 25, resistance wire 30 and conducting wire 13 through terminal 17 and switch member 15 to the appliance. In this instance it is apparent that the resistance wire 30 should be of proper value to drop the supply line voltage from 220 to 110 volts. It will be apparent that any heat generated by the resistance wire in connection with such voltage drop would be readily dissipated by the circulation of air through the numerous openings in the protective shell 23 of the resistor.

It is further apparent that many changes in construction and rearrangements of the parts might be resorted to without in the least departing from the spirit of my invention.

Having thus described the invention, what is claimed is:

1. A device of the character described, comprising an insulated base member, a pair of terminal members mounted thereon and adapted to be coupled to a source of electric current, an upstanding sheet of insulating material also secured to said base at the opposite side from said terminal members, resistance wire carried by said insulating sheet and secured at one end to one of said terminal members, substantially non-resisting bus leads extending from each of said terminal members beyond the uppermost limit of said insulating sheet, a transversely extending insulated member positioned above the top of said insulating sheet, three terminal members mounted thereon, said substantially non-resisting bus leads being coupled to two of said last named terminal members, and the free end of said resistance wire being coupled to the third of said last named terminal members, a three-wire conducting cable two of said wires respectively electrically connected to the terminals securing said substantially non-resisting bus leads and the third electrically connected to the terminal secured to said resistance wire, the opposite end of each of said wires adapted to be placed in electrical contact with an electrical appliance, a switch for closing electrical circuits through said appliance, said switch manually operable to engage one of said wires connected to one of said bus leads, or to engage the wire connected to said third resistance wire, the other of said wires adapted to be placed in an electrical contact with said appliance, free of engagement with said switch whereby current can optionally be directed to said apparatus through a closed circuit of the two bus leads with substantially undiminished voltage or through a closed circuit of one bus lead and said resistance, thus delivering a voltage of less than the source voltage.

2. A device of the character described, comprising an insulated base member, a pair of terminal members mounted thereon and adapted to be coupled to a source of electric current, an upstanding sheet of insulating material also secured to said base at the opposite side from said terminal members, resistance wire carried by said insulating sheet and secured at one end to one of said terminal members, substantially non-resisting bus leads carried by said sheet of insulating material and extending from each of said terminal members beyond the uppermost limit of said insulating sheet, a transversely extending insulated member positioned above the top of said insulating sheet, three terminal members mounted thereon, said substantially non-resisting bus leads being coupled to two of said last named terminal members, and the free end of said resistance wire being coupled to the third of said last named terminal members, a three-wire conducting cable two of said wires respectively electrically conected to the terminals securing said substantially non-resisting bus leads and the third electrically connected to the terminal secured to said resistance wire, the opposite end of each of said wires adapted to be placed in electrical contact with an electrical appliance, a switch for closing electrical circuits through said appliance, said switch manually operable to engage one of said wires connected to one of said bus leads, or to engage the wire connected to said third resistance wire, the other of said wires adapted to be placed in an electrical contact with said appliance, free of engagement with said switch whereby current can optionally be directed to said apparatus through a closed circuit of the two bus leads with substantially undiminished voltage or through a closed circuit of one bus lead, and said resistance, thus deliverying a voltage of less than the source voltage, and a ventilating protective shell engaging said base member and said transversely extending insulated member and encasing said insulating sheet to support the parts in a unitary structure.

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