March 6, 1934. W. K. FLEMING 1,949,996

MEANS FOR CONNECTING ELECTRICAL APPLIANCES TO POWER LINES

Filed Nov. 27, 1928

Fig. 1.

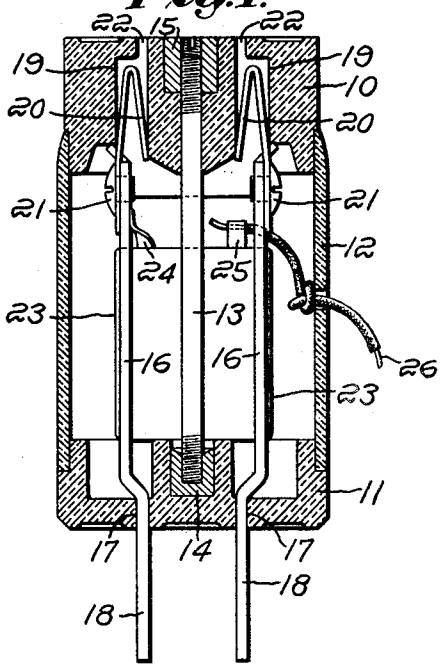


Fig. 2.

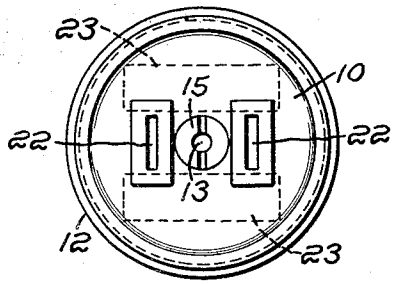


Fig. 3.

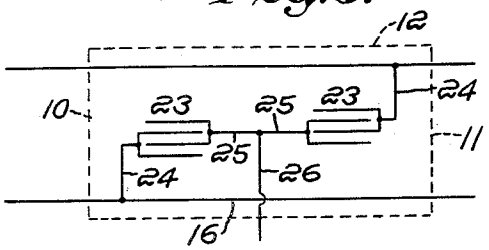


Fig. 4.

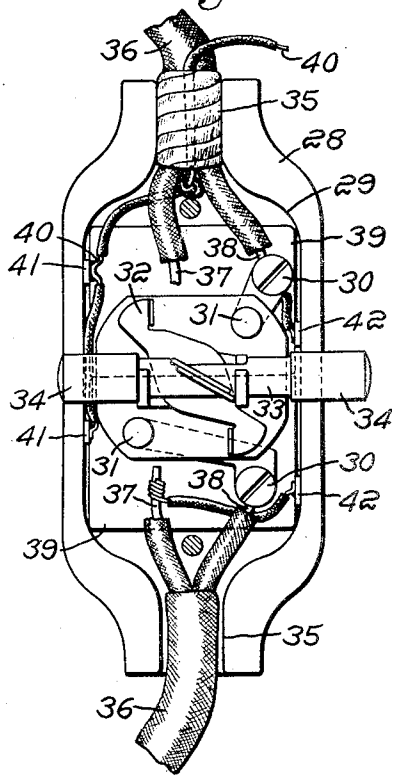


Fig. 5.

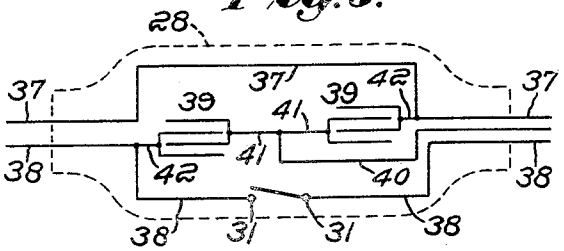
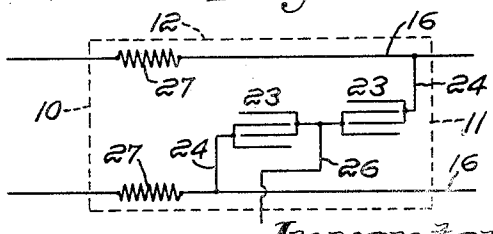


Fig. 6.



Inventor:
Wilfred K. Fleming,
by Emery, Booth, Janney & Varney.
Attys.

Patented Mar. 6, 1934 1,949,996

UNITED STATES PATENT OFFICE

1,949,996

MEANS FOR CONNECTING ELECTRICAL APPLIANCES TO POWER LINES

Wilfred K. Fleming, Canton, Mass., assignor to Tobe Deutschmann Corporation, Canton, Mass., a corporation of Delaware

Application November 27, 1928, Serial No. 322,243

3 Claims. (Cl. 178—44)

This invention relates to means for connecting an electrical appliance, such as a motor, to the power lines of a building, and aims to provide means for preventing the appliance from setting up interference with radio reception. The invention may be variously embodied in connectors of different kinds, and in switches for controlling the electrical appliances.

The invention will be best understood by reference to the following description, when taken in connection with certain embodiments disclosed in the accompanying drawing, while its scope will be more particularly pointed out in the appended claims.

In the drawing:

Fig. 1 is a sectional view of a plug-in connector embodying the invention;

Fig. 2 is a plan of the upper end of the same;

Fig. 3 is an electrical diagram of the connector disclosed in Figs. 1 and 2;

Fig. 4 is a sectional view of a cord switch embodying the invention;

Fig. 5 is an electrical diagram of the switch disclosed in Fig. 4; and

Fig. 6 is an electrical diagram illustrating a modification of the disclosure of Fig. 3.

Referring to Figs. 1, 2 and 3, of the drawing, and to the embodiment of the invention which is illustrated therein, there is shown a connector comprising a casing composed of two end caps 10 and 11 of insulating material, connected to each other by a tubular sleeve or shell 12, also of insulating material, the three parts being securely connected to each other, as by a rod 13 threaded at one end into a nut 14 anchored in the cap 11, and at its other end into a nut 15, which may be unscrewed from the rod to permit the device to be dismounted. The casing houses a pair of conductors 16, which extend through apertures 17 in the cap 11, and present prongs 18 to be plugged into a socket. The cap 11 is provided with chambers 19, which receive contacts 20, suitably attached as by screws 21 to the conductors 16. The cap 10 is further provided with apertures 22 for the insertion of usual conducting prongs, similar to the prongs 18, into the chambers 19 for engagement with the spring contacts 20.

The casing houses two fixed condensers 23, one of which is shown in Fig. 1, as it is behind the plane of the section, but the other is not shown, because it is in front of said plane. However, both condensers are shown diagrammatically in Fig. 3. Each condenser has one terminal 24, connected to one of the conductors 16, and each has a second terminal 25, these two terminals being connected to each other,—that is to say, the condensers are in series, and are connected across the power conductors. In practice, it is found that if each condenser has a capacity of from .02 microfarads to 2. microfarads, satisfactory results are achieved. Heretofore, it has been generally supposed that interference-preventing condensers must have very large capacities, and hence must be of considerable size, but I have found that condensers of the capacities which I have mentioned are ample to avoid the setting up of interference with radio reception.

In many instances, the device as thus far described is all that is necessary to ground out the interference set up by the electrical appliances, especially where the connector can be applied very close to the electrical appliance. In other instances where the interference is severe, a conductor 26 connected between the two condensers and leading from the casing for attachment to the frame of the motor or other appliance will eliminate interference.

While the use of the described condensers, especially when used in connection with the third conductor for attachment to the motor frame, will suffice in most cases to eliminate interference, it is desirable to use in some extreme cases chokes or impedances 27 (see Fig. 6) in the line wires or conductors, and these impedances should be placed behind the condensers,—that is to say, between the condensers and the current source. The value of these chokes may vary, but can be between .002 to .01 milhenries. It should be understood that the use of these chokes is for a case of extreme interference, where the condensers alone will not suffice.

Figs. 4 and 5 show the application of the invention to a cord switch, having a casing 28 provided with a chamber 29, which houses a switch mechanism of common form, comprising two binding posts 30, two fixed contacts 31, a movable switching contact 32, and a plunger 33, having push buttons 34, which project through the sides of the casing. It should be understood, of course, that the switch mechanism operates in the usual manner to make and break a connection between the fixed contacts 31.

The casing is provided with passages 35, leading from the chamber to the ends of the casing for cords 36, each containing a conductor 37 and a conductor 38. The conductor 37 extends entirely through the chamber without break, although in the drawing, it is shown as broken to disclose the switch mechanism. The ends of

the conductors 38 are attached to the binding posts 30.

The casing houses two condensers 39 like those previously described, and in like manner connected to each other in series, and connected across the conductors 37 and 38. In this case, also, there is provided a third conductor 40 connected to the mid-point between the condensers, and leading from the casing for attachment to the frame of the motor or other appliance. In the form shown in Fig. 4, the condensers 39 are conveniently placed with two of their edges abutting along a line behind the switch mechanism. The condensers have usual terminals 41 and 42 for attachment to the conductors.

In connection with the use of the two condensers and the third conductor connected to the mid-point between them, it should be understood that this is done because the frame of the motor or other appliance must not become common to either side of the line. In other words, if one condenser were used from the positive side of the line, then the frame of the device to which the other side of the condenser would be connected would have to be common to the other or negative side of the line. This is not good practice; as the frame should always be insulated from both sides of the line. Furthermore, if only one condenser were used from the line to the frame of the device, it would be necessary to use a polarized receptacle for the input cord of the device, in order that the condenser would always be on the positive side of the line. By the use of the two condensers and the third conductor, it is unnecessary for the user to shift the plug from one side to the other of the line, to be sure that he is connecting the apparatus into the line in the same way.

Having thus described one embodiment of the invention, but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In a unitary connector for connecting an electrical appliance to the power lines which supply the appliance and for suppressing radio-frequency oscillations set up by the appliance, the combination of a casing comprising two members, each provided with two passages, said casing being provided with a chamber between the passages of one member and the passages of the other member, a rod within said chamber connecting said members to each other, two conductors for the two sides of the power circuit, said conductors being located partly in said chamber and partly in the passages of each of said members, and means within said chamber for suppressing radio-frequency oscillations set up by the appliance.

2. In a unitary connector for connecting an electrical appliance to the power lines which supply the appliance and for suppressing radio-frequency oscillations set up by the appliance, the combination of a casing comprising two members, each provided with two passages, said casing being provided with a chamber between the passages of one member and the passages of the other member, a rod within said chamber connecting said members to each other, two conductors for the two sides of the power circuit, said conductors being located partly in said chamber at opposite sides, respectively, of said rod, and partly in the passages of each of said members, and means within said chamber for suppressing radio-frequency oscillations set up by the appliance.

3. In a unitary connector for connecting an electrical appliance to the power lines which supply the appliance and for suppressing radio-frequency oscillations set up by the appliance, the combination of a casing comprising two members, each provided with two passages, said casing being provided with a chamber between the passages of one member and the passages of the other member, a rod within said chamber connecting said members to each other, two conductors for the two sides of the power circuit, said conductors being located partly in said chamber and partly in the passages of each of said members, two condensers within said chamber at opposite sides, respectively, of said rod, said condensers being connected in series and connecting said conductors to each other, and a third conductor connected between said condensers and leading from said chamber for attachment to the appliance.

WILFRED K. FLEMING.