

[54] **ELECTRICAL ADAPTER**

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[51] Int. Cl. **H01r 3/06**

[58] Field of Search 339/14, 28, 29, 154, 157,
339/260, 261, 30, 31, 32; 242/85.1

[56] **References Cited**

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[57] **ABSTRACT**

A grounding adapter having an insulating body member including a pair of male-female electric contact blades and a female ground receptacle. A lead wire connects with the ground receptacle and has a free end extending beyond the body member with an alligator clip secured to the free end. The body member has a peripheral groove around which the lead wire can be wrapped and retained therein by clipping the alligator clip to the body member.

7 Claims, 5 Drawing Figures

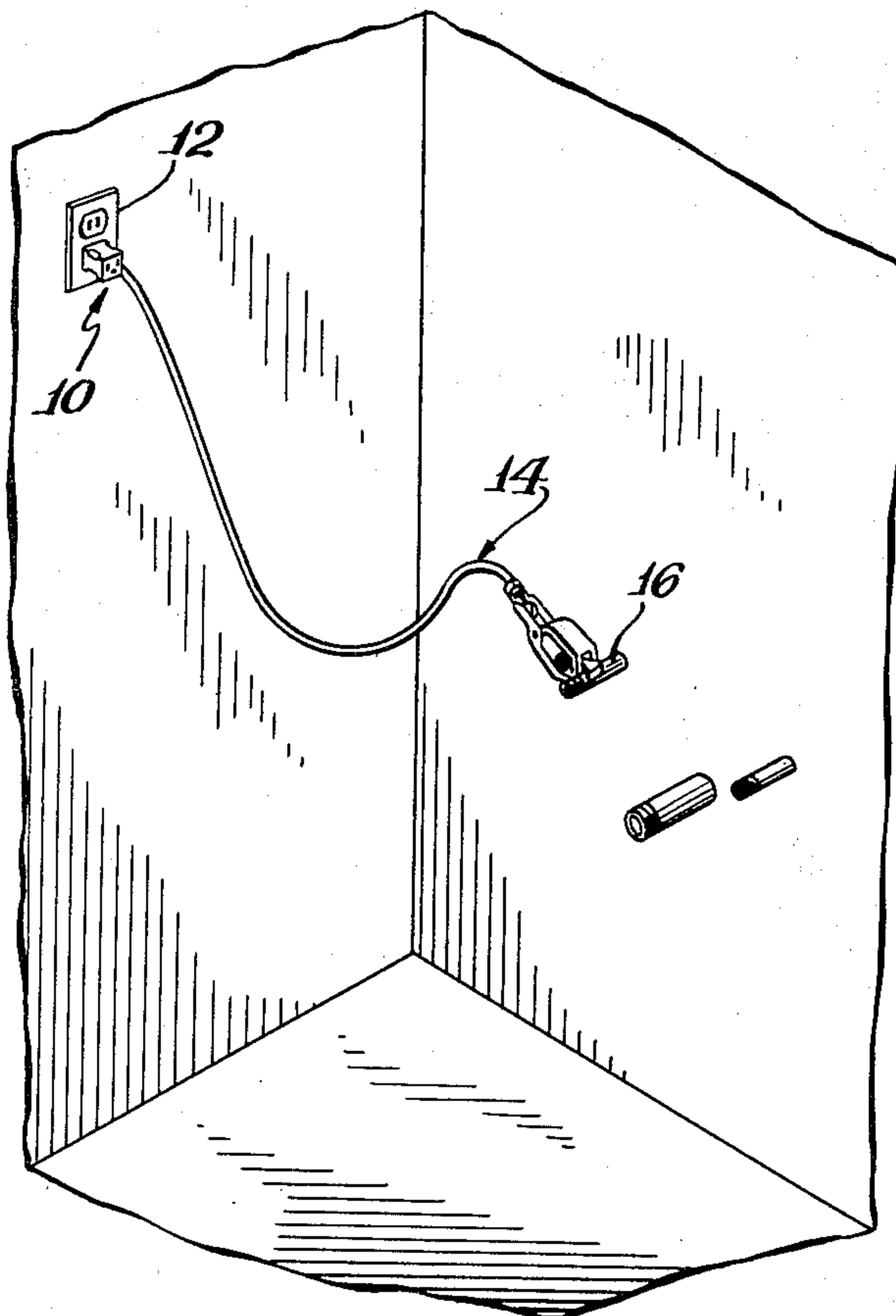


FIG. 1.

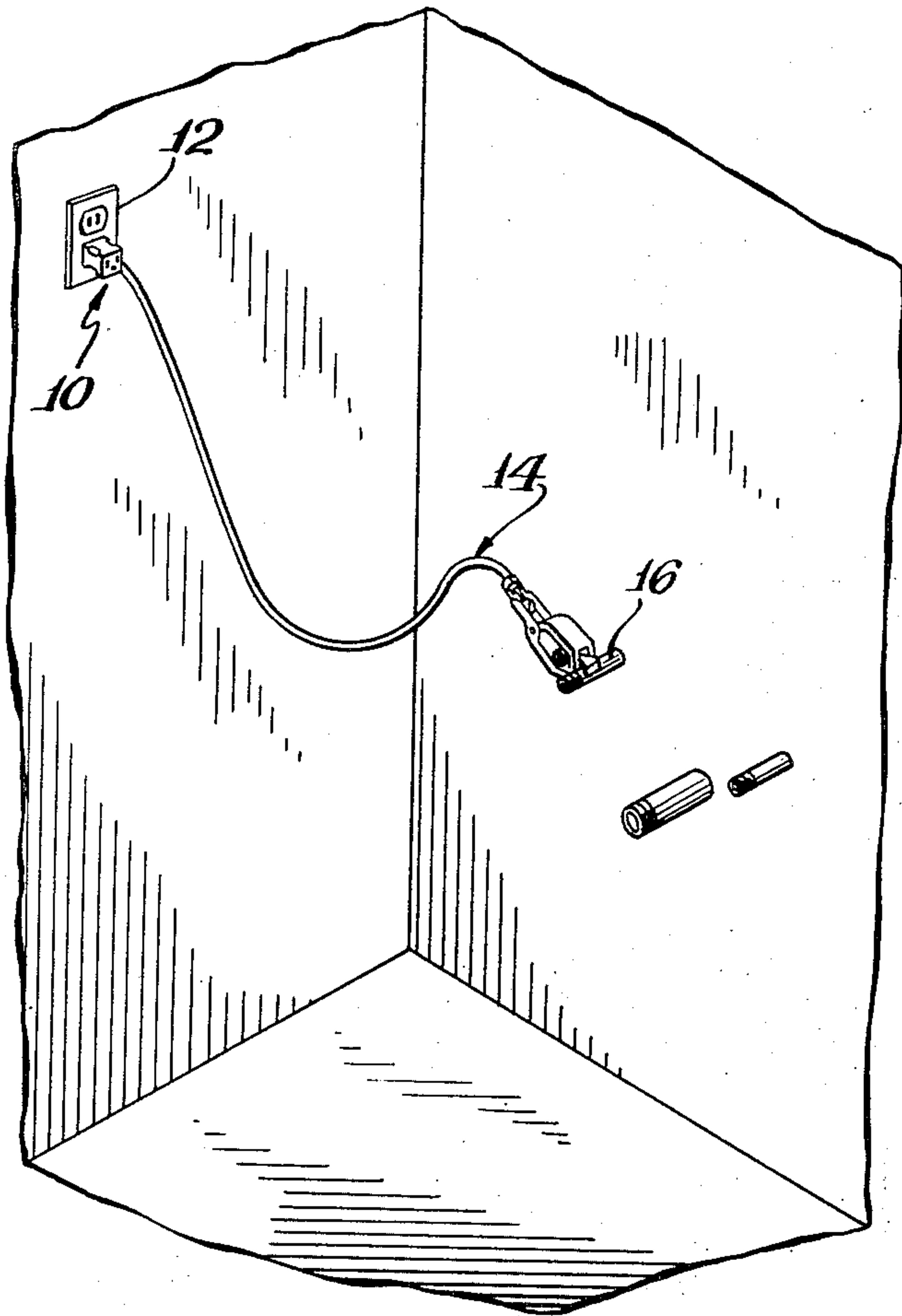


FIG. 5.

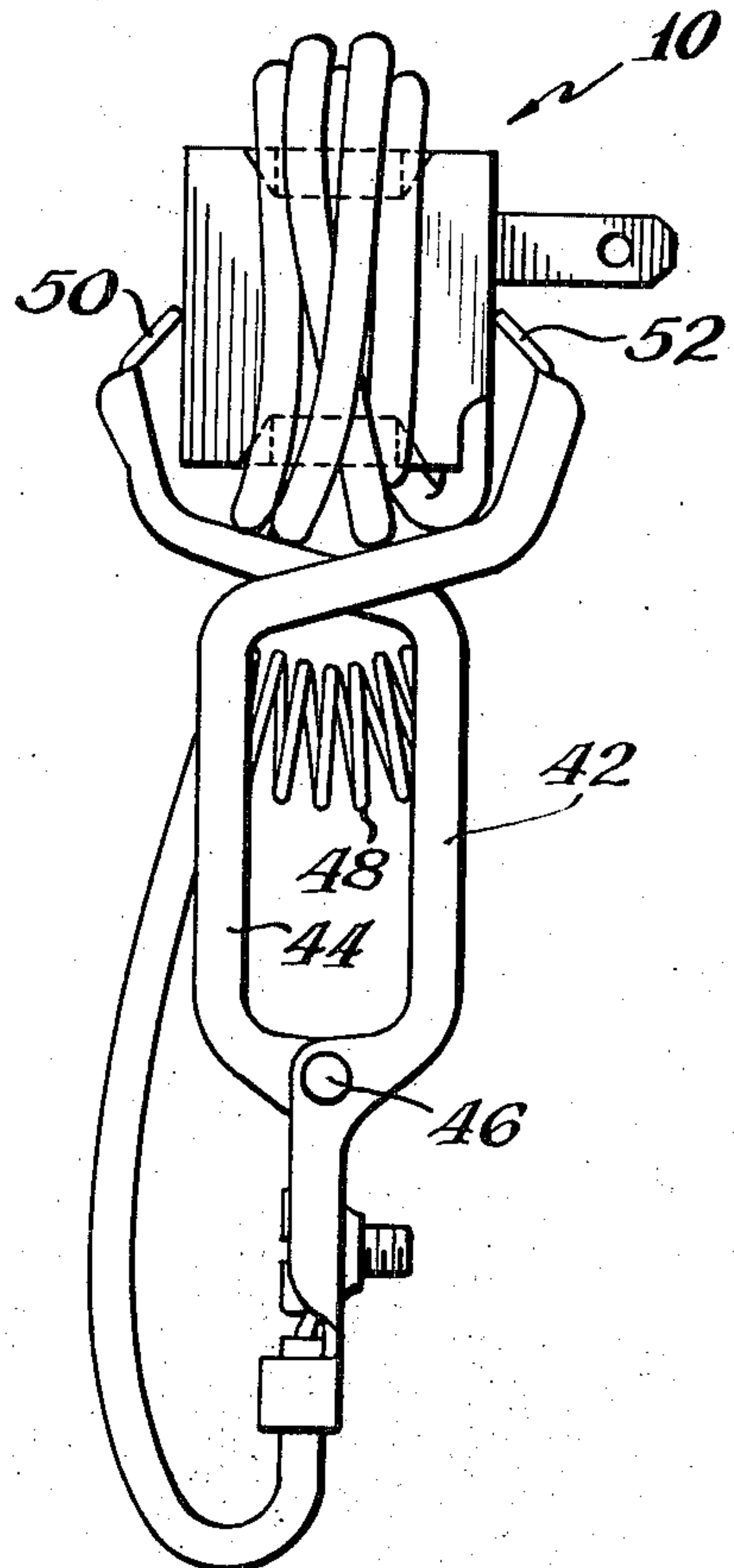


FIG. 3.

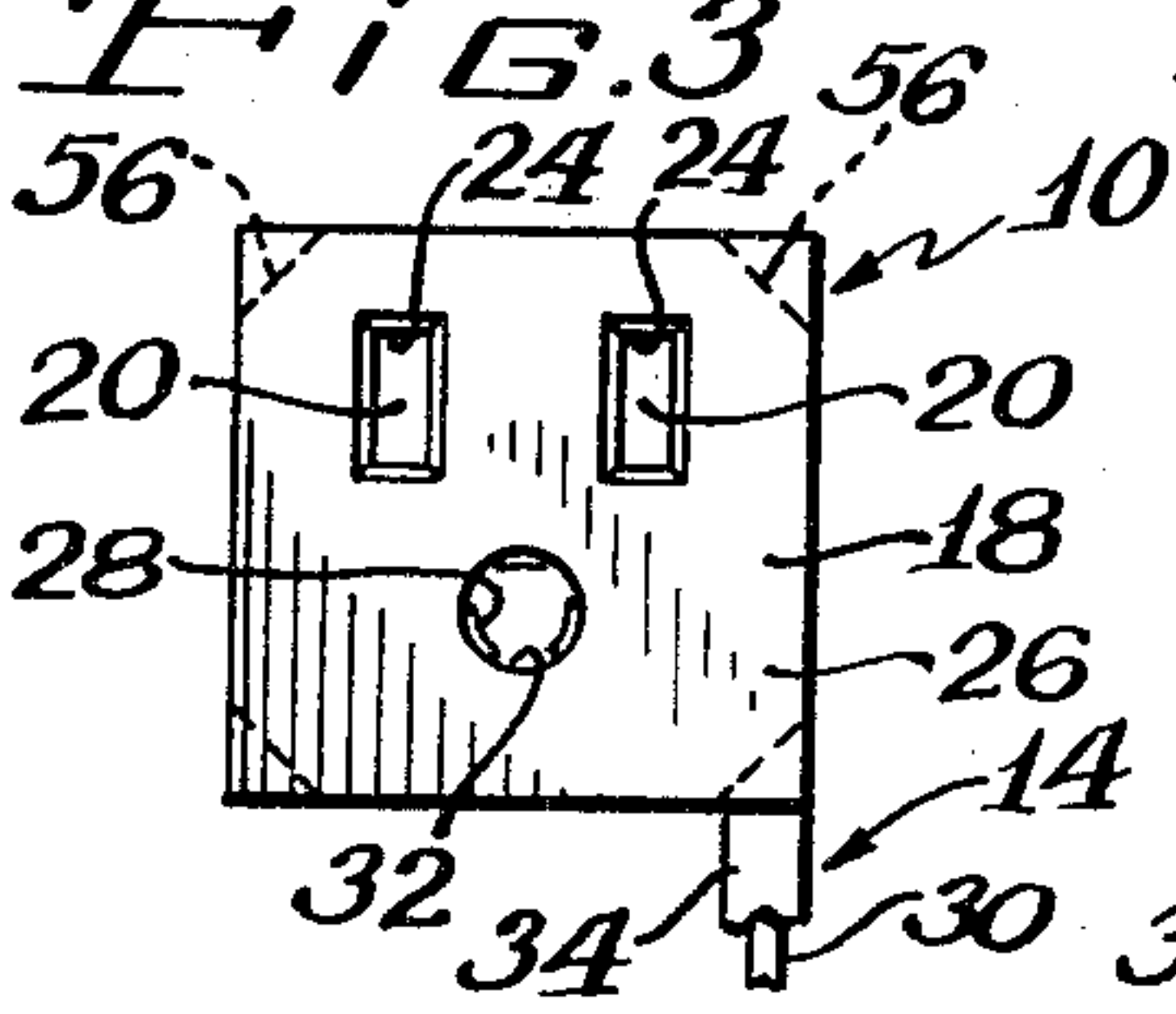


FIG. 2.

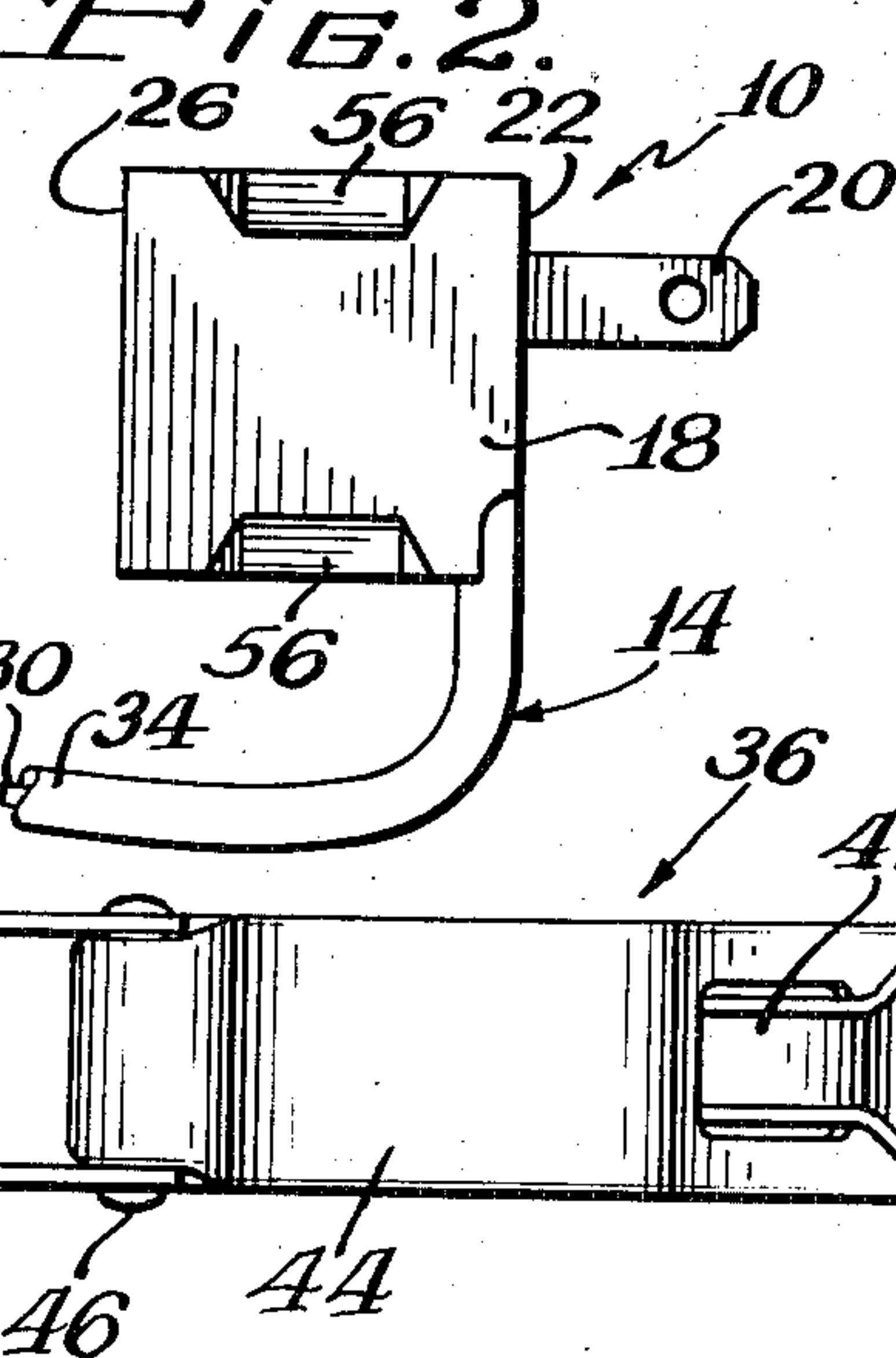
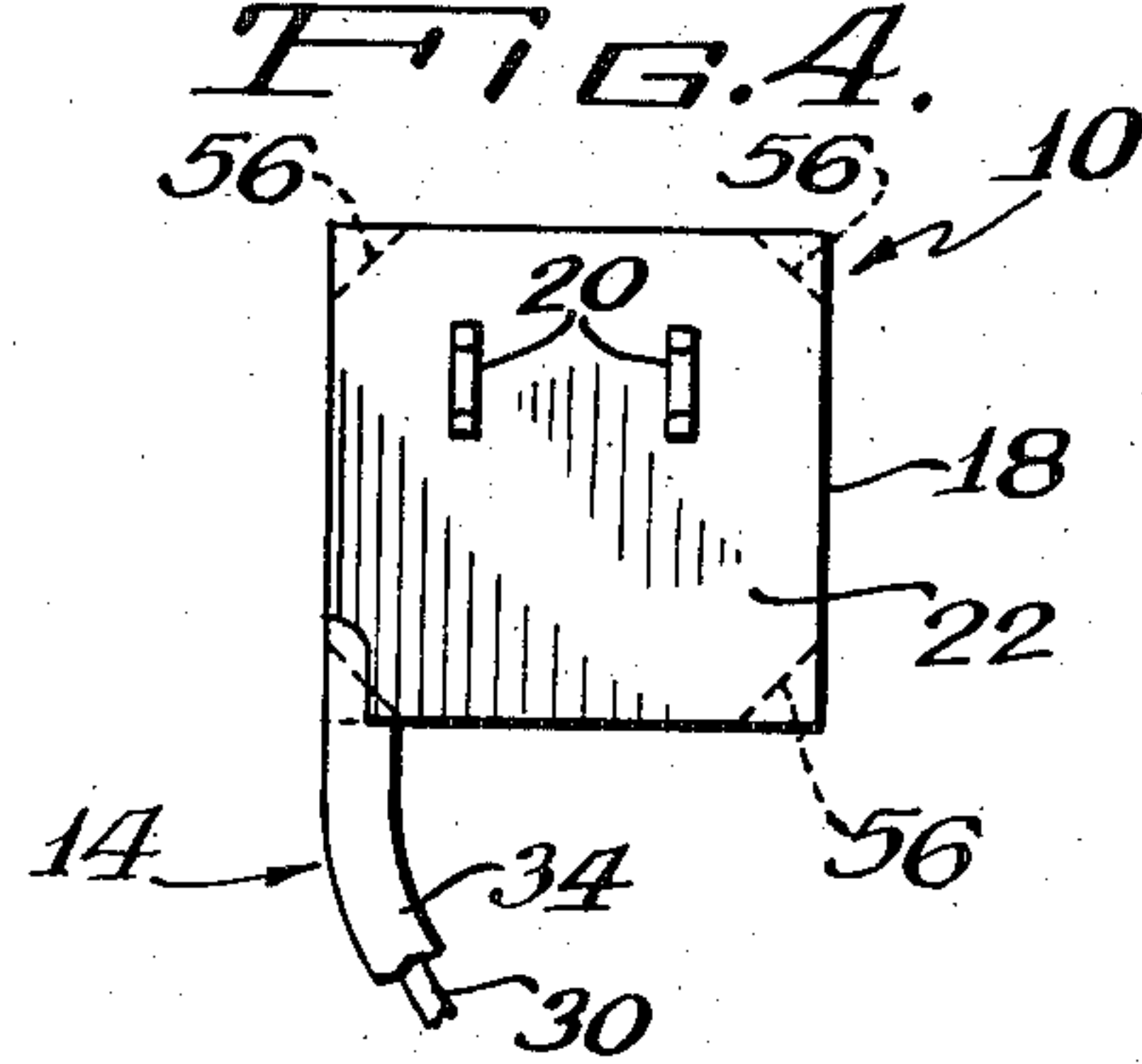


FIG. 4.



ELECTRICAL ADAPTER

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates generally to an electrical adapter having a grounding pigtail which permits a three-wire attachment male plug, including a grounding contact, to be plugged into a two-wire female receptacle, and more particularly relates to such an adapter which is convenient to use, store and transport.

Most hand-held power tools in use currently are provided with a three-prong male plug, including a grounding contact. The need for a ground connection with such a power tool is well known and it is sufficient to observe herein that the operation of such a tool without adequate ground connection subjects the tool operator to the risk of severe injury and possibly even loss of life. Many electrical outlets, particularly in older residential units, are of the two-wire female receptacle type. Hence, an adapter is necessary to establish electrical contact between the three-prong plug on the power tool and the two-wire receptacle. The prior art is replete with such adapters having a short pigtail for connection with a ground, as shown in the Von Holtz U.S. Pat. No. 2,966,651, Traher U.S. Pat. No. 3,034,083, and Klumpp U.S. Pat. No. 3,268,847, for example. Such a short pigtail permits a physical connection only with the electrical box in which the female receptacle itself is mounted. There is no assurance that such a box is itself grounded and it is often difficult and time-consuming to determine whether such an electrical box is grounded and, if it is connected to ground, whether there is sufficient conductivity in its connection to ground, i.e., absence of high resistance, in order to carry the current from a power tool, or from a high voltage line which may be severed during operation of the power tool, to the ground. Should the mounting box not be grounded or grounded with a relatively high resistance, the operator's risk is not diminished. In addition, such a connection with the mounting box requires the use of hand tools, such as a screwdriver, to effect the connection, and to establish a good electrical contact therewith.

Adapters of this type are commonly carried about or stored in tool boxes, particularly by workmen, such as plumbers and other craftsmen whose work takes them to a great number of job sites. The adapters are often co-mingled with other tools within the tool box, some of which are quite heavy. Under such circumstances the prior art adapter, particularly the relatively fragile pigtail, can be damaged as it or one of the tools is extracted from the tool box.

It is, therefore, an object of this invention to provide an adapter which permits a quick and easy connection with an adequate ground, and which does not require the use of additional hand tools to effect such a connection.

It is also an object of this invention to provide an adapter which permits a wider selection of possible ground connections and which contributes to the establishment of a low resistance contact with the selected ground connection.

It is another object of this invention to provide an adapter which may be stored and transported easily

and conveniently, and which minimizes the possibility of damage thereto.

These and other objects of the present invention, and many of the attendant advantages thereof, will become more readily apparent from a perusal of the following description and the accompanying drawings; wherein:

FIG. 1 is a perspective view of an adapter according to the present invention installed for use in a typical environment;

FIG. 2 is a side elevational view of the adapter shown in FIG. 1 with portions of the pigtail eliminated;

FIG. 3 is an elevational view of the left end of the adapter of FIG. 2 with the pigtail partially eliminated;

FIG. 4 is an elevational view, similar to FIG. 3, of the right end of the adapter of FIG. 2; and

FIG. 5 is a view similar to FIG. 2, but showing the pigtail and clip disposed on the adapter in its storage and transport position.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings, there is shown in FIG. 1 an adapter, indicated generally at 10, which has been plugged into a wall receptacle 12 and has the pigtail 14 connected with a water pipe 16 located on a wall different from that mounting the wall receptacle 12. It can be readily seen therefrom that the adapter of this invention permits the operator of a power tool to install the adapter into the wall receptacle, select an obviously suitable ground connection, even though located remote from the wall receptacle, and establish a good electrical contact with the ground before connecting the power tool.

Referring now to FIGS. 2-4, the adapter 10 has an insulating body member 18 with a pair of male-female electrical contact blades 20 secured therein. The contact blades 20 have the male end protruding beyond one end 22 of the body member. Openings 24 formed on the opposite end 26 of the body member permits access to the female end of the blades 20. The contact blades 20 may be of any desired design and, for example, may be of the type disclosed in U.S. Pats. No. 2,966,651 or 3,268,847. A female ground receptacle 28 is secured in the body member 18 and is electrically connected with the conductor or wire 30 of the pigtail 14. An opening 32 in the end 26 of the body member 18 permits access to the receptacle 28. The pigtail 14, which includes the wire 30 having an insulating cover 34, is physically secured at one end to the body member 18, such as by molding for example, and is physically secured to an alligator clip 36. The physical connection may be by means of tabs 38 compressed over and around the cover 34 and the conductor or wire 30, while electrical connection with the clip 36 is by means of tightening the set screw 40 on the wire 30.

The alligator clip 36, as best seen in FIG. 5, has a generally S-shaped jaw 42 to which a complementary shaped jaw 44 is pivotally mounted by means of pin 46. A compression spring 48 is trapped between the jaws and urges the free ends 50 and 52 of the jaws 42 and 44 respectively together. The free ends 50 and 52 are provided with teeth, indicated at 54 in FIG. 2. The teeth 54 permit the free ends 50 and 52 to be placed in a gripping position, under the force of the spring 48, on the ground connection, and the clip 36 to be moved

in a rocking motion to establish a good electrical contact therewith; the teeth 54 scratching through any insulating coating on the ground connection during such rocking motion. Hence, the alligator clip 36 not only permits a rapid and easy connection means, but also functions to clean the connection surface to establish a good contact, all without requiring the use of any tools other than the clip itself.

To facilitate storage and transport, the body member 18 is provided with notches 56, on the edges extending between the ends 22 and 26, to establish a groove around the body member. While as shown, the body member 18 is a cube with the notches 56 only formed on the corners to establish a groove therearound, it is apparent that the body member may take other shapes and a continuous groove formed therearound, if desired. As shown in FIG. 5, the pigtail 14 can be wrapped or coiled around the notches 56 and the alligator clip 36 with the free ends 50 and 52 engaging the surfaces 22 and 26 to retain the coiled pigtail 14 within the groove formed by the notches 56. The distance between the surfaces 22 and 26 must not be greater than the maximum opening permitted between the free ends 50 and 52 of the jaws. Also, it is highly advantageous that the pigtail 14 not be subjected to sharp bends in order to minimize the possibility of breaking the wire 30 adjacent to the body member 18. Hence, it is desirable to position the exit of the pigtail 14 from the body member to one corner thereof, as can be seen in FIGS. 2, 3 and 4. This helps to minimize sharp bends during wrapping and also removes the exit position from the area in which the coils are being formed.

While a preferred embodiment of the present invention has been disclosed, it is to be understood that various changes and modifications may be made without departing from the spirit of the invention as defined by the scope of the appended claims.

What is claimed is:

1. A grounding adapter for connecting a male plug having a ground prong with an ungrounded female receptacle while permitting ready electrical connection of the ground prong to a suitable ground means at a location remote from the female receptacle; said adapter comprising:

- an insulating body member having opposite faces;
- a pair of male-female electric contact blades secured in said body member;
- the male portion of each of said blades protrudes be-

yond one of said faces to permit insertion in said female receptacle;

the other of said faces is provided with three openings to receive said male plug;

two of said openings having access to the female portion of each of said blades so that electrical continuity may be established between said female receptacle and said male plug;

a female ground receptacle is positioned within the remaining one of said openings;

a lead wire is connected with said female ground receptacle, said lead wire having a length of at least three feet, said length sufficient to reach said remote location with said body member adjacent said female receptacle;

a clip means secured to the free end of said wire;

said clip means having at least one movable jaw;

bias means carried by said clip means to urge said jaws toward a closed gripping position;

said jaws being capable of being forced apart a distance at least sufficient to span the distance between said opposite faces, whereby said clip means may be stored by releasable connection with said body member, groove means on the periphery of said body member around which the lead wire may be wrapped, said periphery not including said opposite faces, and said clip means being capable of gripping said body member on said opposite faces to retain said lead wire thereon.

2. A grounding adapter according to claim 1, wherein said jaw is provided with teeth capable of engaging and scratching the surface to be gripped thereby.

3. A grounding adapter according to claim 2, wherein said clip means comprises an alligator clip.

4. A grounding adapter according to claim 3, wherein said body member is provided with groove means around which said lead wire may be wrapped.

5. A grounding adapter according to claim 1, wherein said body member is generally square in cross-section.

6. A grounding adapter according to claim 5, wherein said groove means comprises a notch formed on each corner of a cross-section of said body member.

7. A grounding adapter according to claim 6, wherein said lead wire exits from said body member at one corner thereof.

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