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GROUNDING DEVICES FOR ELECTRICAL COMPONENTS

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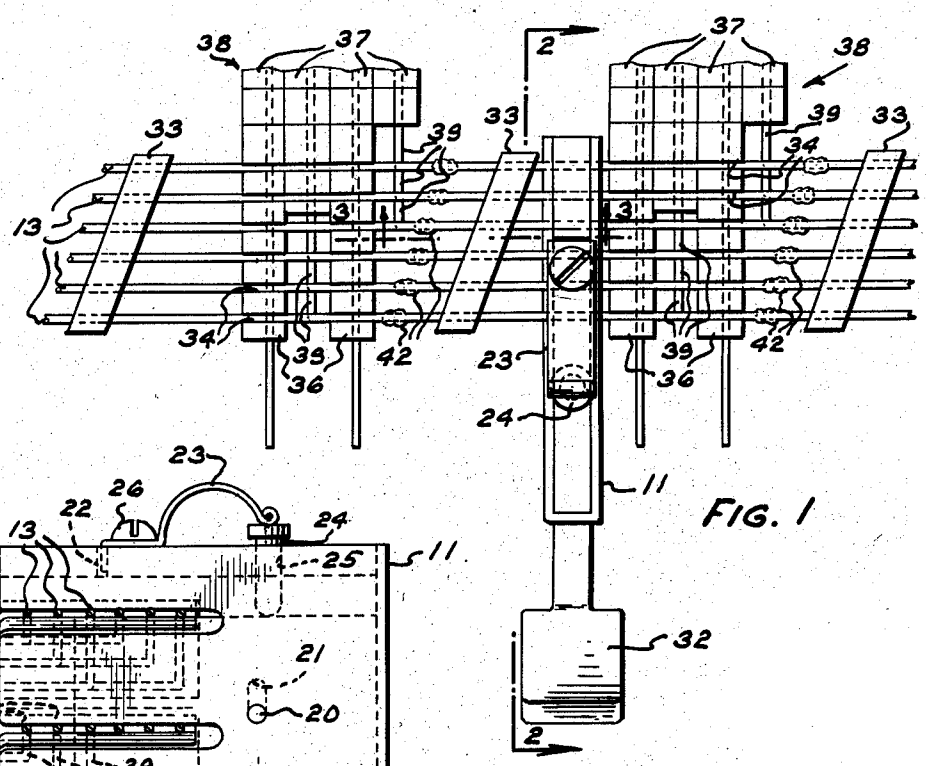


FIG. 1

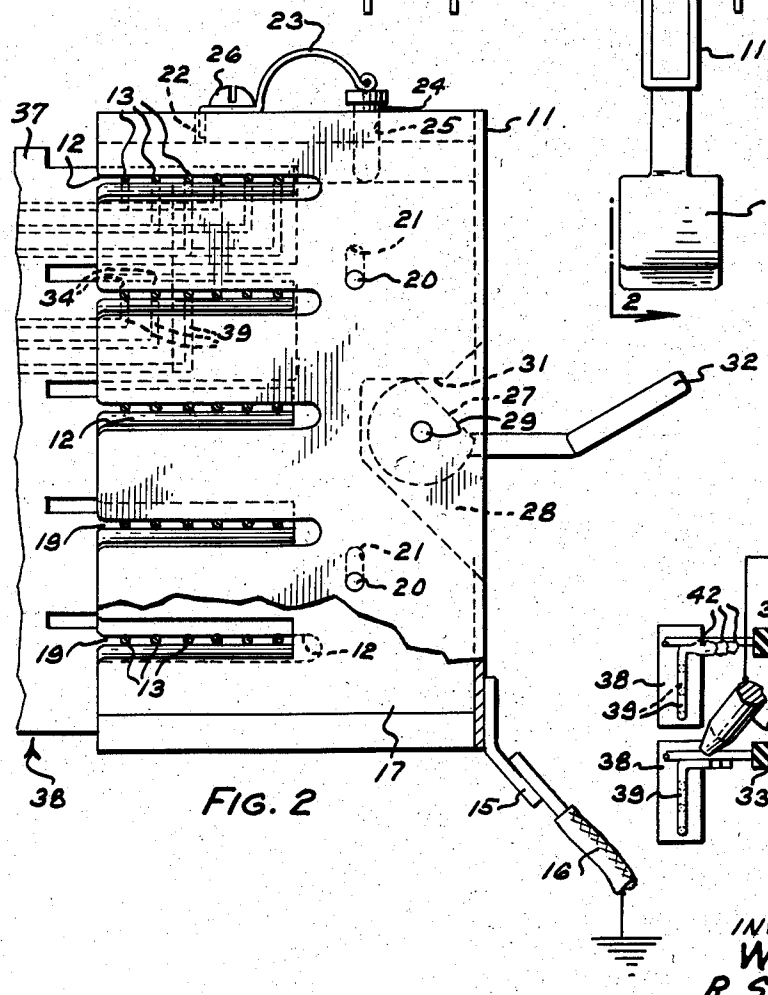
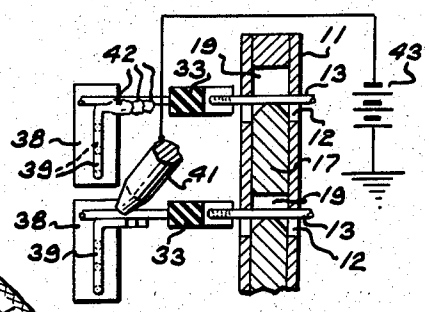


FIG. 2

FIG. 3



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GROUNDING DEVICES FOR ELECTRICAL COMPONENTS

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4 Claims. (Cl. 333—249)

This invention relates to grounding devices for electrical components and more particularly to devices for simultaneously grounding a plurality of spaced wires.

An object of this invention is to provide a device for simultaneously grounding a plurality of spaced wires.

Another object of this invention is to provide a grounding device which is quickly attached to a plurality of innerconnecting wires to connect them to ground whereby wires of a wire spring relay can be resistance soldered to the innerconnecting wires.

One embodiment of the present invention may include a grounded hollow conductive member having slots for receiving a plurality of spaced innerconnecting wires to be connected to ground. A clamping element slidable in the hollow member and having slots corresponding to the slots in the hollow member is moved to partially close the slots in the hollow member to thus clamp the wires between the clamping element and the hollow member to connect them to ground.

Other objects and advantages of the invention will become apparent by reference to the following detailed description and the accompanying drawing illustrating a preferred embodiment of the invention, in which—

Fig. 1 is a plan view of the device showing it connected to the wires to be grounded;

Fig. 2 is an elevational view taken along line 2—2 of Fig. 1 showing the wires in clamped position; and

Fig. 3 is an enlarged fragmentary view taken on line 3—3 of Fig. 1 showing the soldering electrode in position to solder a relay wire to a wire clamped in the device.

Referring now in detail to the drawing, a flat hollow conductive shell **11** having slots **12** for receiving a plurality of rows of parallel spaced innerconnecting wires **13** to ground them and also having a tang **15** secured to its lowermost portion, is shown connected to ground by a cable **16** secured to the tang **15**. A clamping element **17** having a plurality of slots **19** complementary to the slots **12** in the hollow shell **11** is slidably mounted in the shell **11** whereby upward movement of the clamping element **17** relative to the shell closes the slots **12** in the shell to clamp the innerconnecting wires **13** therein between the shell **11** and the element **17**, thus connecting them to ground. A pair of pins **20** secured to the shell **11** pass through slots **21** in the clamping element **17** to limit its movement in the shell.

A spring **23** attached to the top of the shell **11** presses on a plunger **24** passing through an aperture **25** in the shell and urges the plunger into engagement with the clamping element **17** to move it downward to open the slots **12** in the shell **11**. A tang **22** on the spring **23** extends into a hole **26** in the shell **11** to prevent rotation of the spring on the shell.

A cam **27** is supported in a recess **28** in the clamping element **17** by a pin **29** secured to the shell **11** whereby the cam **27** can be rotated clockwise (Fig. 2) to engage a surface **31** of the clamping element **17** to move it upward and close the slots **12** in the shell **11**, thereby

clamping the wires **13** and connecting them to ground. A handle **32** is secured to the cam **27** for rotating it to move the element **17** into clamping and non-clamping positions.

The innerconnecting wires **13** to be grounded are held in parallel spaced relation by a plurality of bars **33** secured thereto and are supported in slots **34** in insulated portions **36** of a plurality of wire spring relay combs **37** which portions project from a wire spring relay **38**. Other insulated portions **36** of the combs **37** of the wire spring relay **38** have relay contact wires **39** which extend outward and are formed whereby their ends are parallel to the innerconnecting wires **13** and are in engagement with them so that they can be readily soldered together.

A conductive resistance soldering tool **41** of a well known type is shown (Fig. 3) in position to sequentially heat the innerconnecting wires **13** and the contact wires **39** to melt solder **42** placed thereon and thus solder them together. A low voltage is applied by a battery **43** to the soldering tool **41**, causing a large amount of current to flow from the tool through the innerconnecting wires **13** and the clamping device to ground, thus heating the wires **13** and **39** whereby the soldering operation is performed. The soldering tool **41** is manually moved to solder each innerconnecting wire **13** to a corresponding relay contact wire **39**.

In operation, the handle **32** is moved counterclockwise (Fig. 2) to move the clamping element **17** to open the slots **12** in the shell **11**. The operator then moves the handle **32** and the cam **27** clockwise. Thus the cam **27** engages the surface **31** of the clamping element **17** and moves it upward to clamp the wires **13** between the shell **11** and the element **17** (Fig. 3), thus grounding the wires **13** and **39** whereby the soldering operation can be performed. The soldering tool **41** is then used to establish an electrical heating circuit to solder the relay contact wires **39** to the innerconnecting wires **13**. After the contact wires **39** are soldered to the innerconnecting wires **13** in a particular work position, the handle **32** is moved counterclockwise to release the clamping element and open the slots **12** in the shell **11**, whereupon the device is manually moved into another work position and the above procedure is repeated to solder other wires together.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of this invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for grounding a plurality of spaced wires, the ends of which are inaccessible, comprising a grounded hollow conductive shell having a plurality of spaced slots extending from one side thereof in a transverse direction for receiving intermediate portions of a plurality of wires to be grounded, a clamping element slidably mounted in the shell and having a plurality of transverse slots extending from one side thereof in the direction of and corresponding to the slots in the shell whereby movement of the clamping element in the shell partially closes the slots therein to clamp the wires, means on the shell normally urging the clamping element to a position with the slots thereof in alignment with the slots in the shell, and means for moving the clamping element in the shell.

2. A device for simultaneously grounding a plurality of relatively stiff spaced wires the ends of which are inaccessible, comprising a conductive hollow shell having a plurality of spaced transverse slots extending from one side thereof in one direction for receiving intermediate portions of a plurality of wires to be grounded, a clamping element slidably mounted in the shell and having a

plurality of transverse slots extending from one side thereof in the direction of and complementary to the slots in the shell whereby movement of the clamping element in the shell partially closes the slots therein to clamp said intermediate portions of the wires between the shell and the element, means for actuating the clamping element to partially close the slots in the shell, and means normally urging said clamping element to a position with its slots in alignment with the slots in the shell.

3. A device for grounding a plurality of rows of relatively stiff spaced wires the ends of which are inaccessible, comprising a hollow conductive shell having a plurality of parallel transverse slots extending from one side thereof in one direction for receiving intermediate portions of a plurality of parallel rows of wires, a clamping element slidably mounted in the shell and having a plurality of transverse slots extending from one side thereof in the direction of and corresponding to the slots in the shell whereby movement of the clamping element in the shell partially closes the slots therein to clamp said intermediate portion of the wires, a cam pivoted to the shell for engaging the clamping element to move it to partially close the slots in the shell for clamping the wires, means for moving the cam, a plunger passing through the shell and engaging the clamping element, and a spring secured to the shell and engaging the plunger for moving it to urge the clamping element to a position

with its slots in alignment with the slots in the shell to open them and free the wires.

4. A device for making electrical connections with a plurality of elongated electrically conductive elements the ends of which are inaccessible, comprising a first jaw having a plurality of transverse slots extending from one side thereof in one direction for receiving intermediate portions of a plurality of elongated electrically conductive elements, a second jaw slidably mounted on the first jaw and having a plurality of transverse slots extending from one side thereof in the direction of the slots in the first jaw and normally in alignment with the slots in the first jaw, a cam mounted on the first jaw for moving the second jaw from its normal position whereby the slots therein are out of alignment with the slots in the first jaw, and means mounted on the first jaw and engaging the second jaw for urging it toward normal position with its slots in alignment with the slots in the first jaw.

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