July 8, 1969 C. G. MATTEO 3,453,713

ELECTRICIAN'S TOOL FOR SECURING GROUNDING CLIPS

Filed Oct. 17, 1966

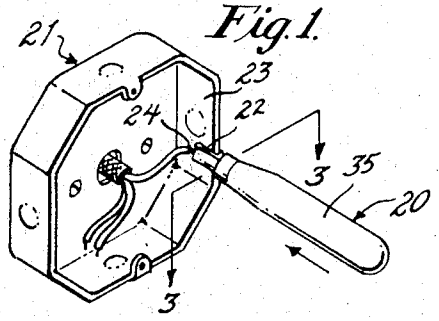


Fig. 1.

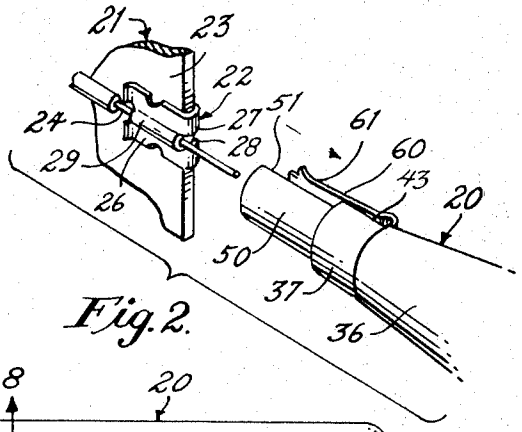


Fig. 2.

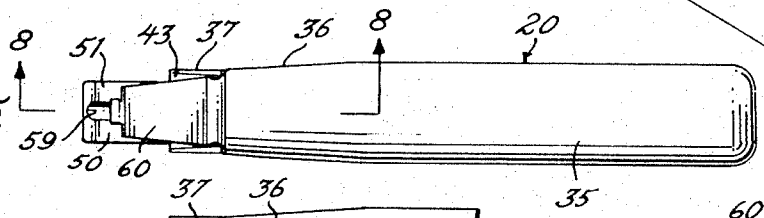


Fig. 5.

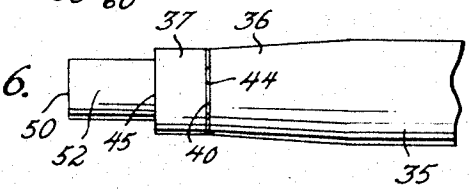


Fig. 6.

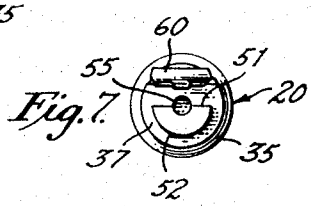


Fig. 7.

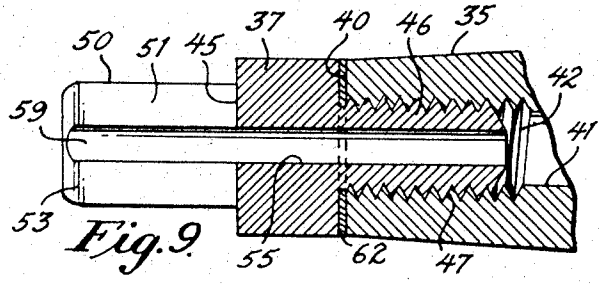


Fig. 9.

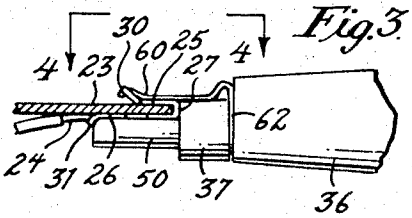


Fig. 3.

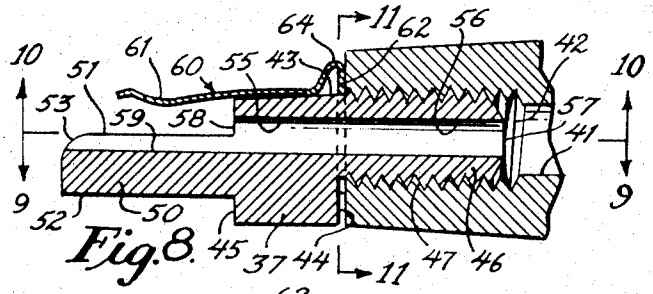


Fig. 8.

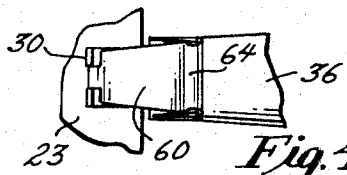


Fig. 4.

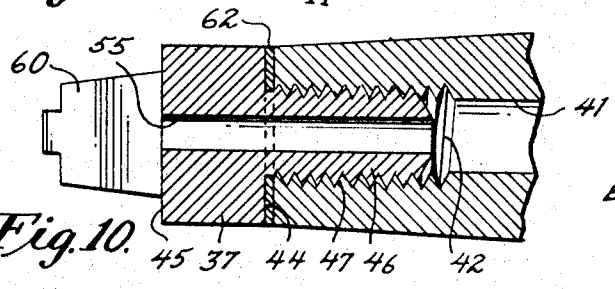


Fig. 10.

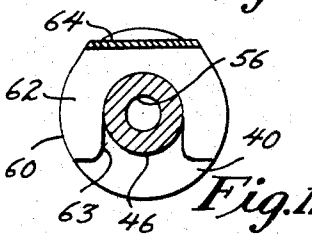


Fig. 11.

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ELECTRICIAN'S TOOL FOR SECURING GROUNDING CLIPS

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U.S. Cl. 29—203 7 Claims

ABSTRACT OF THE DISCLOSURE

A tool including a handle having a hole extending inwardly through one end, a stem extending outwardly from said one handle end and having on one side a groove defining an extension of the handle hole, and a finger on the handle extending from the one handle end in laterally spaced facing relation with respect to the stem.

This invention relates generally to electricians' tools, and is especially concerned with a tool for grounding switch and outlet boxes, and the like.

As is well known to those versed in the art, switch and outlet boxes must be grounded, in accordance with wiring codes and laws. A grounding clip has come into commercial usage to simplify the box-grounding operation previously requiring the winding of a grounding wire about a screw, and tightening of the screw. Grounding clips of this type are disclosed in U.S. Patent No. 3,021,581, which clips are formed for simultaneous reception of a grounding wire and a wall of the electrical box.

While the use of grounding clips has simplified prior procedures, and has resulted in more reliable grounding, the engagement of such clips in their grounding relation with a box has heretofore presented a difficult manipulative operation to the electrician.

Accordingly, it is an important object of the present invention to provide a tool for applying grounding clips to electrical boxes, which greatly simplifies the operation, being substantially instantaneous and requiring only one hand of the user by the instant tool.

It is a further object of the present invention to provide a tool of the type described wherein a grounding clip and wire may be readily inserted into the tool, and together applied to an electrical box in a greatly expedited manner assuring reliable grounding.

It is still a further object of the present invention to provide a tool having the advantageous characteristics mentioned in the preceding paragraphs, which tool is extremely simple in construction, involving no moving parts, the tool being durable and reliable throughout a long useful life, and capable of economic manufacture for sale at a reasonable price.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a perspective view illustrating the operative procedure employing a tool in accordance with the teachings of the present invention;

FIGURE 2 is a perspective view similar to FIGURE 1, illustrating completion of the grounding operation;

FIGURE 3 is a partial sectional view taken generally along the line 3—3 of FIGURE 1, enlarged for clarity;

FIGURE 4 is a partial longitudinal view taken generally along the line 4—4 of FIGURE 3;

FIGURE 5 is a longitudinal elevational view illustrating one side of a tool of the present invention apart from a grounding clip;

FIGURE 6 is a partial longitudinal elevational view of the tool of FIGURE 5, illustrating the other side of the tool;

FIGURE 7 is an end view of the instant tool, as from the lefthand end of FIGURES 5 and 6;

FIGURE 8 is a partial longitudinal sectional view taken generally along the line 8—8 of FIGURE 5, enlarged for clarity;

FIGURE 9 is a longitudinal sectional view taken generally along the line 9—9 of FIGURE 8;

FIGURE 10 is a longitudinal sectional view taken generally along the line 10—10 of FIGURE 8; and

FIGURE 11 is a transverse sectional view taken generally along the line 11—11 of FIGURE 8.

Referring now more particularly to the drawings, and specifically to FIGURES 1 and 2 thereof, a tool of the instant invention is there generally designated **20**, and illustrated in operative association with an electrical junction box, as a switch or outlet box **21**. In FIGURE 1 a clip **22** is held by the tool **20** and being applied over an edge of the box wall **23**, with a ground wire **24** engaged in the clip.

The clip **22** is best seen in FIGURES 2 and 3, and by reference to said prior U.S. patent, as being generally of U-shaped configuration including a pair of facing spaced legs **25** and **26** connected together at one end by a bight portion **27**. The free ends of the legs **25** and **26** may be bent obliquely outward, as at **30** and **31** to facilitate their sliding engagement on opposite sides of the box wall **23**. The bight portion **27** may be formed with a thru opening **28**; and, one leg **26** of the clip may be deformed outward, as by a semicylindrical formation **29** providing on the inner side of leg **26** a longitudinally extending groove opening through the bight-portion cutout **28**. Thus, as best seen in FIGURE 2, the grounding wire **24** is adapted to be received in and extend along the inner side of the groove-defining formation **29**, with the wire projecting through and beyond the opening or cutout **28**. It will thus appear that the grounding wire **24** is held by resilience of the clip **22** in firm electrical contact with the box wall **23**.

The tool **20** includes an elongate body **35**, say of generally cylindrical external configuration, and may taper, as at **36**, toward an end section **37**. The end section **37** is disposed in end-to-end relation with the body section **35**, and may combine therewith to define a handle, as will appear presently. The body section **35** has formed extending inward through its reduced end **40** a blind bore or hole **41** provided with internal screw threads **42**.

The end section **37** may be generally cylindrical, of a diameter approximating that of the body-section end **40**, but is formed with a chordal section removed defining a flat **43**. As best been in FIGURE 8, the flat **43** may taper slightly from the inner end **44** of the end section **37** to the outer end **45** of the end section. Further, the inner end **44** of the end section **37** is provided with a central extension or shank **46** having external screw threads **47** for threaded engagement in the hole **41**, as seen in FIGURES 8–10. In this condition, the threaded shank **46** and internal screw threads **42** in the hole **41** combine to define connection means connecting the body section **36** and end section **37** with their respective ends **40** and **44** in facing relation.

Projecting from the outer end **45** of the end section **37** is a rigid elongate extension or stem **50**. The stem **50** may be of generally semicylindrical external configuration, having one side flat, as at **51**, the flat side being adjacent to the flat **43** of the end section **37**, while the cy-

lindrical surface **52** of the stem is remote from the flat **43**. The flat stem surface **51** may have its outer end region smoothly curved or beveled, as at **53**.

Generally centrally through the end section **37** is formed a thru opening or passageway **55**, which extends longitudinally through the shank **46**, as at **56**, and opens through the shank end remote from the end section, as at **57**. The passageway **55** opens through the nonfacing or outer end **45** of the end section **37**, as at **58**; and, the flat side **51** of the stem **50** is formed with a longitudinally extending groove **59** which defines a generally semicylindrical extension of the passageway or hole **55**. Thus, in the assembled condition shown in FIGURES 8–10, the body-section hole **41**, passageway **56**, **55**, and groove **59** combine to define a continuous hole or passageway from the interior of the body section opening longitudinally outward through the outer open end of groove **59**.

A finger **60**, say in the form of a resilient leaf spring or strip is disposed along the flat **43** of end section **37**, extending longitudinally of the handle **35**, **37**, and projecting longitudinally outward beyond the outer end **45** of the end section in parallel faced spacing relation with the flat side **51** of stem **50**. The spring finger or strip **60** may be formed adjacent to its outer end with a depression **61** extending inward toward the stem **50**, for a purpose appearing presently. At the inner end of the spring finger or strip **60** there is provided a transversely extending securement portion **62**, which may be integral with the remainder of the strip, and formed with a cutout or notch **63**, best seen in FIGURE 11. The transverse securement portion **62** is engageable between the facing ends of sections **35** and **37**, with the notch **63** receiving shank **46**; and upon tightening of the threaded connection means **46**, **42**, the securement portion **62** is firmly anchored or clamped between the handle sections. The inner end of strip **60** may be connected to the securement portion **62** by a bent portion **64**, whereby the spring finger **60** is afforded added resilient deflectability away from the stem **50**. That is, in its normal condition, the spring finger **60** may bear against the flat **43**, while being resiliently deflectable away from the stem **50**.

In practice, it is only necessary to insert a clip **22** into the space between stem **50** and finger **60**, with the clip formation **29** engaged in the stem groove **59**, and the clip bight portion **27** against the end-section surface **45**. A wire to be grounded may then be inserted along the concave side of clip formation **29**, through the opening **28** of the clip bight portion, and thence through passageway **55**, **56** and into hole **41**, to the desired extent. In this condition, the tool may be grasped in the hand of a user, as by the handle **35**, **37**, and moved toward the edge of a box wall to engage the wall **23** edgewise into the clip **22** between the clip legs **25** and **26**, as seen in FIGURE 3. That is, the legs of the clip **22** are distended by this forced engagement, and frictionally grasp the box wall so that withdrawal of the tool **20** leaves the clip engaged on the box wall and forcibly holding the grounding wire **24** in its grounding connection with the box. Of course, the above-described procedure is repeated, as required.

From the foregoing, it is seen that the present invention provides a tool for securing a grounding clip to an electrical box which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture, distribution and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. A tool for securing a grounding clip to an electrical box, said tool comprising an elongate handle, said handle being provided with a hole extending longitudinally inwardly through one handle end, a stem on said handle extending longitudinally outwardly from said one handle end on one side of said hole, said stem being formed with a longitudinal groove defining an extension of said hole and opening through the outer end of said stem, and a finger on said handle extending longitudinally outwardly therefrom on the other side of said hole in laterally spaced facing relation with respect to said stem, whereby a grounding clip is adapted to be held between said stem and finger with a grounding wire passing through the clip into said hole.

2. A tool according to claim **1**, said finger being resiliently distensible away from said stem for frictionally retaining a clip in its held condition.

3. A tool according to claim **1**, said stem being rigid with respect to said handle and having its groove facing toward said finger for conforming engagement with a wire-receiving formation of a clip.

4. A tool according to claim **1**, said handle being sectional and comprising a body section, an end section in end-to-end relation with said body section, and connection means detachably connecting said sections in said end-to-end relation.

5. A tool according to claim **3**, said finger comprising a resilient strip extending freely along and outwardly beyond said end section, and a transverse securement portion on said strip anchored in clamped relation between said body and end sections.

6. A tool according to claim **5**, said connection means comprising a theaded shank on one section, the other section having an internally threaded shank-receiving cavity, said securing portion having a notch receiving said shank and being secured in said clamped relation by threaded engagement of said shank in said cavity.

7. A tool according to claim **6**, said hole extending through said end section and shank.

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U.S. Cl. X.R.

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