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Gartland, Jr.

[11] **3,890,026**

[45] **June 17, 1975**

[54] **WIRE-FORM GROUNDING CLIP FOR ELECTRICAL FIXTURES**

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[73] Assignee: **Harvey Hubbell, Incorporated**, Bridgeport, Conn.

[22] Filed: **Mar. 14, 1974**

[21] Appl. No.: **451,183**

[52] **U.S. Cl.** ..... **339/21 R**; 174/151

[51] **Int. Cl.** **H01r 9/00**

[58] **Field of Search** 339/14, 133, 134; 174/51

[56] **References Cited**

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3,723,941	3/1973	Schumacher et al.	339/14 R
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Primary Examiner—Roy D. Frazier
Assistant Examiner—Robert A. Hafer
Attorney, Agent, or Firm—Wooster, Davis & Cifelli

[57] **ABSTRACT**

A reliable grounding path is provided between electrical fixtures and their mounting boxes with a continuous strand of wire which is configured to have upper and lower loops between which the mounting yoke of the electrical fixture is received. The loops are superposingly aligned and cooperate to create a screw receiving means therebetween for engaging the conventional mounting screw which is utilized to secure the electrical fixture within the mounting box. When the mounting screw is tightened in the screw receiving means, the upper and lower loops are forced to converge against the mounting yoke and an electrical interface thereby results between the mounting yoke and the mounting screw.

12 Claims, 12 Drawing Figures

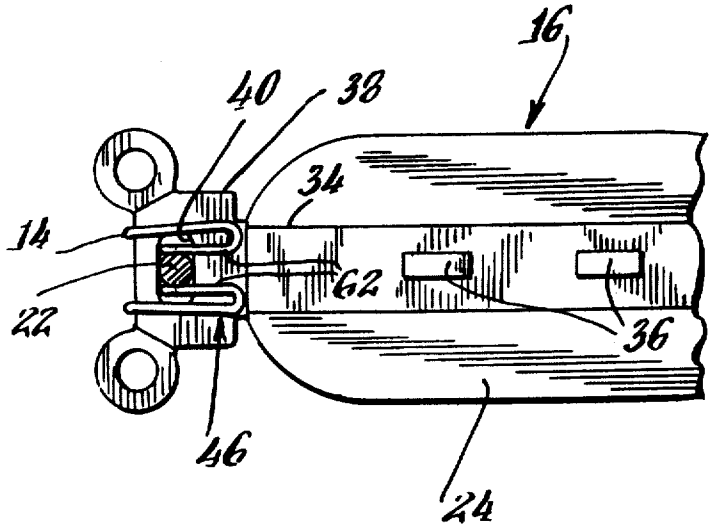


Fig. 1.

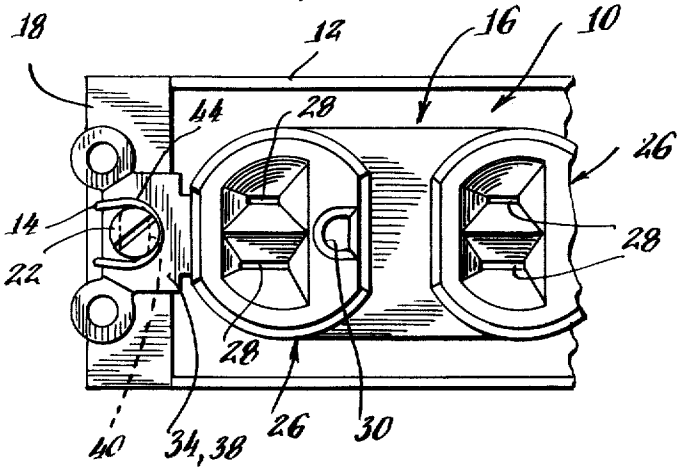
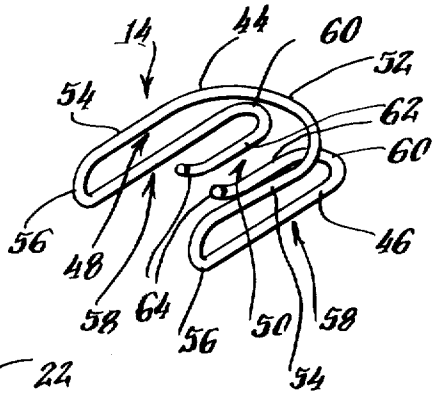


Fig. 4.



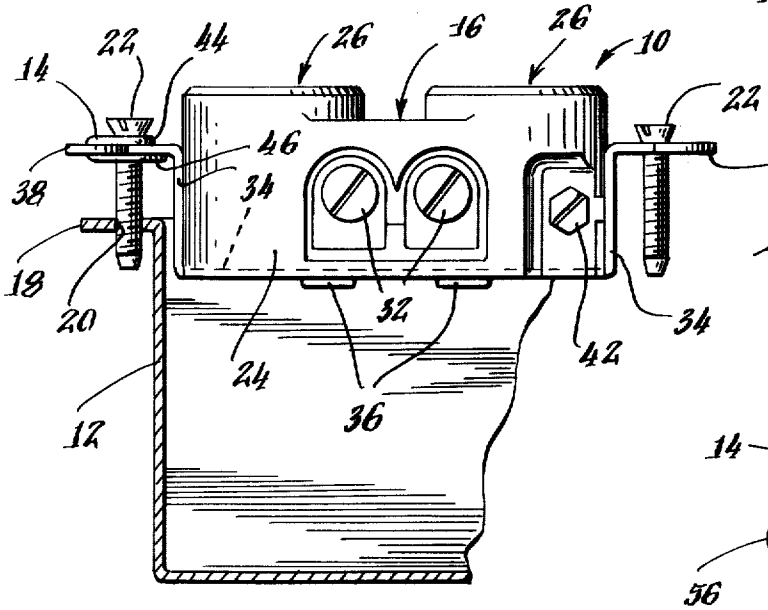


Fig. 2.

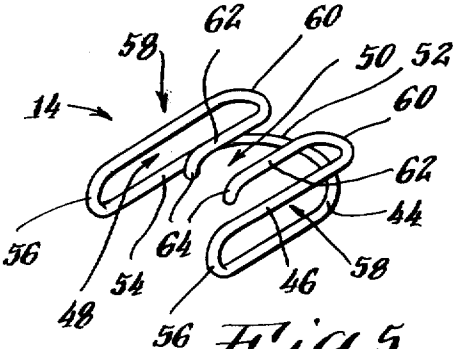


Fig. 5.

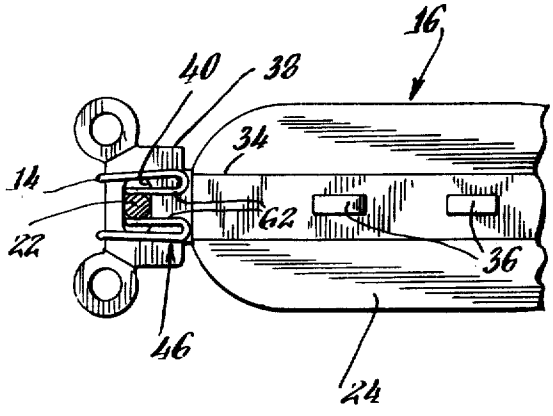


Fig. 3.

Fig. 6.

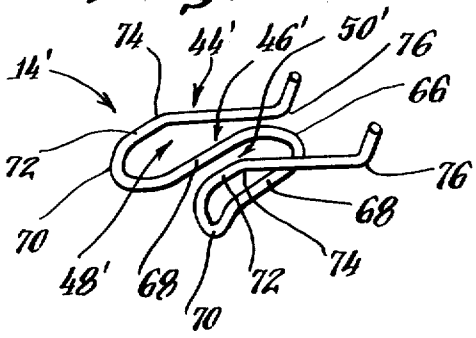
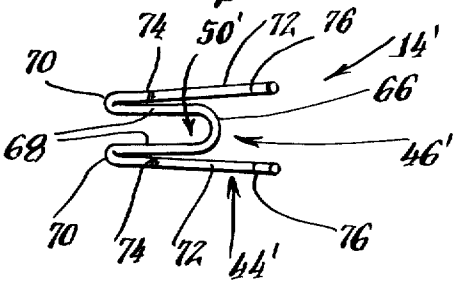


Fig. 7.



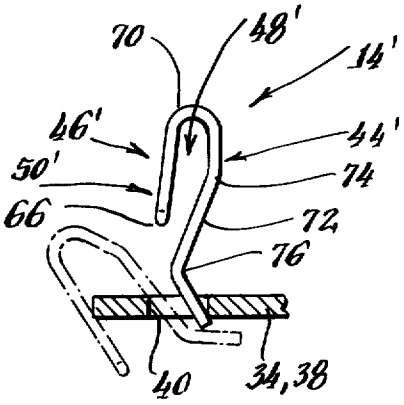


Fig. 8.

Fig. 9.

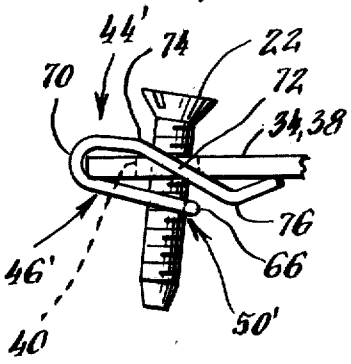


Fig. 10.

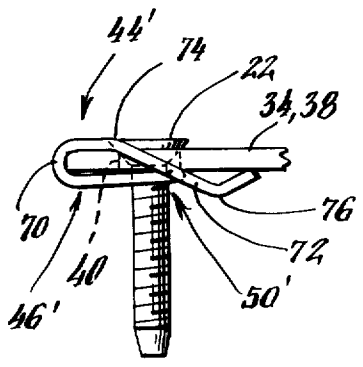
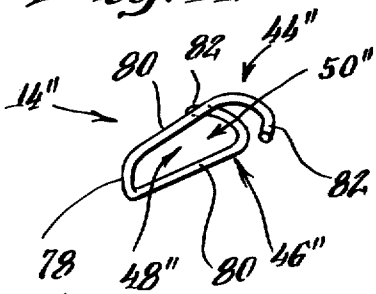


Fig. 11.



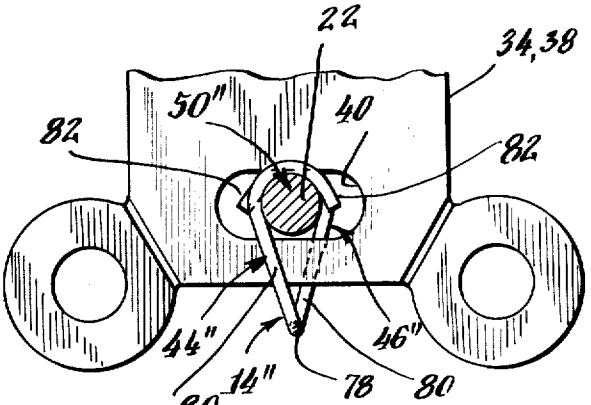


Fig. 12.

WIRE-FORM GROUNDING CLIP FOR ELECTRICAL FIXTURES

BACKGROUND OF THE INVENTION

The present invention relates to grounding clips for electrical fixtures and especially such clips which are fabricated in a simplified configuration from a continuous strand of metallic wire. Hitherto, the most conventional approach to providing a grounding path between an electrical fixture and its mounting box has been to electrically connect a jumper wire therebetween upon installation of the former into the latter. This approach is very time consuming and even where sufficient time has been allotted for connecting the jumper wire, it is inadvertently disregarded on ocasion to thereby result in a hazardous condition. Therefore, many different devices have been utilized to provide the desired grounding path without encumbering the installation, however, all such devices have been of complicated designs and thereby increase ultimate costs unnecessarily.

Many metallic clips having various configurations are known by which the desired grounding path between electrical fixtures and their mounting boxes can be accomplished. One such clip is fixedly attached to the electrical fixture as disclosed in U.S. Pat. No. 3,432,793. Therefore, this clip can not be applied directly to conventional electrical fixtures and ultimate costs are increased appreciably due to the modifications necessitated thereby to the electrical fixture. Another such clip is that disclosed in U.S. Pat. No. 3,663,919 which has been assigned to the assignee of this application. This clip includes a protruding member which is forcibly wedged between the electrical fixture and the mounting box during installation. Aside from its complex configuration, this clip increases ultimate costs by sometimes causing difficulties when the electrical fixture must be removed from the mounting box at a later time. Other such clips are disclosed in U.S. Pat. No. 3,723,941 and in application Ser. No. 278,772 which was filed Aug. 8, 1972 and assigned to the same assignee as this application. Both of these clips are detachably affixable to the electrical fixture, however, they are of complicated configurations and therefore, can only be manufactured at considerable expense. Although all of the above mentioned clips are highly regarded for their intended purpose, their ultimate cost of incorporation to provide the desired grounding path is high when compared to the use of the more conventional jumper wire.

SUMMARY OF THE INVENTION

It is, therefore, a general object of the present invention to provide a grounding path between an electrical fixture and a mounting box with a detachably affixable clip which minimizes the disadvantages of the prior art.

It is another object of the present invention to provide a grounding path between an electrical fixture and a mounting box with a wire-form clip having a simplified configuration for lower manufacturing cost.

It is still another object of the present invention to provide a grounding path between an electrical fixture and a mounting box with a wire-form clip which in no way inhibits the removal of the electrical fixture from the mounting box after installation.

It is a further object of the present invention to provide a grounding path between an electrical fixture and a mounting box with a wire-form clip having portions thereof configured for retention in the conventional mounting screw slots of the electrical fixture.

It is still a further object of the present invention to provide a grounding path between an electrical fixture and a mounting box with a wire-form clip having terminations thereon to penetrate nonconductive substances on the electrical fixture.

These objects are accomplished according to the present invention by configuring a continuous strand of spring wire into an upper loop and a lower loop. Portions of each loop are cooperatively aligned to create a screw receiving means therebetween for engaging a conventional mounting screw. The gap separating the upper and lower loops is of sufficient magnitude to receive the mounting yoke of the electrical fixture against which the loops are forced to bear in making electrical contact. Depending on the particular configuration of the loops, the terminations of the continuous strand are either utilized to retain the wire-form on the electrical fixture or to penetrate nonconductive substances thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

The manner in which these and other objects of the invention are achieved will be best understood by reference to the following description, the appended claims, and the Figures of the attached drawings wherein:

FIG. 1 is a partial top view of an electrical fixture mounted into a mounting box with the wire-form grounding clip of this invention incorporated therebetween;

FIG. 2 is a side view thereof with the electrical fixture being installed into the mounting box of which portions have been cut away to illustrate the electrical continuity existing between the ground terminal on the electrical fixture and the mounting yoke thereof;

FIG. 3 is a partial bottom view of the electrical fixture with the wire-form grounding clip of this invention detachably affixed thereon;

FIG. 4 is a top perspective view of the wire-form grounding clip;

FIG. 5 is a bottom perspective view thereof;

FIG. 6 is a top perspective view of another wire-form clip having an alternate configuration in accordance with this invention;

FIG. 7 is a bottom view thereof;

FIG. 8 is a side view thereof including a mounting yoke portion of the electrical fixture in section to illustrate the initial step in detachably affixing the clip to the mounting yoke, with a more advanced step shown in phantom;

FIG. 9 is a view similar to that of FIG. 8 but illustrating the final orientation of the clip on the mounting yoke with a mounting screw disposed through the screw receiving means;

FIG. 10 is a view similar to that of FIG. 9 but illustrating the converged position of the loops against the mounting yoke when the mounting screw is tightened into the screw receiving means;

FIG. 11 is a top perspective view of still another wire-form clip having an alternate configuration in accordance with this invention; and

FIG. 12 is a top view thereof after being detachably affixed on the mounting yoke of the electrical fixture, with the mounting screw shown sectionally within the screw receiving means which is created by the cooperative arrangement of the upper and lower loops.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawings and more particularly to FIGS. **1, 2** and **3** there is illustrated an electrical fixture **10** which is secured into a mounting box **12** with a wire-form grounding clip **14** disposed therebetween in accordance with this invention. Any suitable electrical fixture **10** could be secured into the mounting box **12** but, by way of example, a standard duplex receptacle outlet **16** has been chosen for use in this disclosure. To eliminate the safety hazard which would otherwise exist, the wire-form grounding clip **14** provides for the electrical continuity necessary to achieve a grounding path between the outlet **16** and the mounting box **12.**

In general configuration, the mounting box **12** is an open-ended enclosure having rectangular sides. The mounting box **12** is fabricated of conductive metal and must be electrically grounded by suitable means. A mounting flange **18** is provided on the mounting box **12** and has threaded apertures **20** which engage with mounting screws **22** in securing the outlet **16** to the mounting box **12.**

The outlet **16** has a generally compatible configuration to that of the mounting box **12** and includes a body **24** made of suitable insulating material, such as plastic. At the front of the body **24,** identical but separate grounded receptacles **26** are disposed. Each receptacle **26** includes a pair of spaced slots **28** associated with internal female contacts (not shown) and a semi-circular opening **30** associated with an internal female grounding contact (not shown). The female contacts mate with the male contacts of a plug and the female grounding contact mates with the male grounding contact on the plug. Screws **32** comprise suitable terminal means for connecting wire conductors to the female contacts and thereby provide for electrically energizing the receptacles **26.** A metallic mounting yoke **34** extends across the rear of the body **24** and is affixed thereto by any suitable means, such as folding tabs **36.** The mounting yoke **34** is also configured to extend along both sides of the body **24** and project laterally therefrom at each side thereof to form mounting ears **38.** An elongated slot **40** is disposed through each mounting ear **38** to permit passage of the mounting screw **22** in alignment with the threaded aperture **20** of the mounting box **12.** A grounding screw **42** comprises suitable terminal means for connecting a ground wire to the mounting yoke **34** which in turn is electrically connected by suitable means (not shown) to the female grounding contacts within the receptacles **26.**

The wire-form grounding clip **14** is fabricated from a continuous strand of electrically conductive wire in a configuration which includes an upper loop **44** and a lower loop **46,** as illustrated in FIGS. **4** and **5.** The loops **44** and **46** are separated by a gap **48** and are superposingly aligned to cooperate in creating a screw receiving means **50** therebetween for engaging with the threads on the mounting screw **22.** The gap **48** is of sufficient magnitude to permit the thickness of the mounting yoke **34** to fit thereinto.

In use, the clip **14** is disposed on the mounting yoke **34** with the lower and upper loops **44** and **46** separated across one mounting ear **38** thereof and with the screw receiving means **50** aligned through the slot **40** in the mounting ear **38.** Then the mounting screw **22** is disposed through the screw receiving means **50** to detachably affix the grounding clip **14** and when the mounting screw **22** is tightened, the upper and lower loops **44** and **46** are forced to converge and bear against the mounting ear **38.** Therefore, a very reliable electrically conductive path between the mounting yoke **34** and the mounting screw **22** is established through the clip **14.** This is so because the grounding clip **14** is electrically conductive and the screw receiving means **50** thereon makes electrical contact with the mounting screw **22,** while the loops **44** and **46** thereof make electrical contact with the mounting yoke **34.** Of course, the gap **48** could be lesser magnitude than the thickness of the mounting yoke **34** and then the clip **14** would be detachably affixable on the mounting ear **38** without the mounting screw **22,** in that the upper and lower loops **44** and **46** would continually bear forcibly thereagainst.

Although the structure described above is essential to the concept of this invention, many different wire-form clip configurations are possible, some of which provide auxiliary features. In fact, grounding clip **14** has a more particular configuration in that the upper loop **44** is configured to provide clearance for the threads on the mounting screw **22,** while the screw receiving means **50** is disposed solely on the lower loop **46.** More precisely the upper loop **44** includes a first bend **52** of substantially 180° and has members **54** which extend from each side of the first bend **52** to a second bend **56** of substantially 180°. The lower loop **46** includes symmetrical members **58,** each of which extends from one of the second bends **56** to a third bend **60** of substantially **180** degrees. A spring member **62** extends beyond the third bend **60** to a point of termination on each symmetrical member **58** and the symmetrical members **58** are cooperatively arranged in the lower loop **46** with the spring members **62** cooperating to create the screw receiving means **50** therebetween.

Although not essential to the primary function of the grounding clip **14,** each spring member **62** is terminated with an inclined tip **64** which locates in the slot **40** of the mounting yoke **34,** as illustrated in FIG. **3.** Furthermore, to dispose the first bend **52** in a reference plane with each second bend **56** in a plane perpendicular to the reference plane and both third bends in a plane parallel to the reference plane, as illustrated in FIGS. **4** and **5,** is the preferred configuration. However, such precise orientation and configuration of the loops **44** and **46** is not essential to the concept of this invention, as will be discussed later. Also it is preferable to use as material for the grounding clip **14,** wire having a diameter which can be disposed between the threads of the mounting screw **22.**

Generally, the grounding clip **14** with the precise configuration of FIGS. **4** and **5** is detachably affixable to the mounting yoke **34** of the electrical fixture **10** in the same manner described previously. Of course, when the inclined tips **64** are included, the grounding clip **14** must be manipulated to locate them in the slot **40** to thereby retain the clip **14** on the mounting ear **38** even when the mounting screw **22** is not disposed through the screw receiving means **50.** Furthermore, the spring members **62** are interspaced at a distance to create the screw receiving means **50,** as illustrated in FIG. **3.** If necessary, the spring members **62** are deflectable and the distance therebetween is dependent on the contact pressure desired against the mounting screw **22** and the wire diameter utilized. Therefore, the screw receiving means **50** continually bears against the threads

of the mounting screw **22** with a force proportional to the spring constant of the spring members **62.** Furthermore, the clip **14** and the mounting screw **22** can be detachably affixed on the electrical fixture **10** during shipment or storage thereof, in a condition for immediate installation. Normally a cardboard washer is used to retain the mounting screw **22** during such shipment and storage periods but because of the force exerted thereagainst by the screw receiving means **50,** no such washers are necessary.

After the grounding clip **14** has been detachably affixed on the electrical fixture **10** with the mounting screw **22** disposed through the screw receiving means **50,** direct installation into the mounting box **12** is then possible by merely aligning the mounting screws **22** with the threaded apertures **20** thereof. It should be noted that the cardboard washers used in the past, as mentioned above, had to be removed before installation of the electrical fixture **10.** Of course, this increased installation time and was necessary because electrical continuity between the mounting box **12** and the mounting yoke **34** could be precluded, if such washers were not removed. Furthermore, the corrective action necessary in those installations where such washers have not been removed due to inadvertence is very time consuming.

As described previously, a very reliable grounding path is established between the mounting yoke **34** and the mounting screw **22** by the grounding clip **14.** When the electrical fixture **10** is installed in the mounting box **12,** forcible retention therebetween is provided through the mounting screw **22** which engages with the threaded aperture **20.** Therefore, the grounding path is then extended from the electrical fixture **10** to the mounting box **12** through the grounding clip **14.**

Another preferred embodiment of the grounding clip **14'** is illustrated in FIGS. **6** and **7,** where similar parts to those illustrated in FIGS. **1 – 5** are identified with the same reference numerals but with a prime (') added. The grounding clip **14'** again includes an upper loop **44'** and a lower loop **46'** which are separated by a gap **48'.** However, the continuous strand of metallic wire is configured quite differently in forming the loops **44'** and **46'.** The lower loop **44'** includes a bend **66** of substantially 180° and has spring members **68** which extend from each side of bend **66** to a bend **70** through an obtuse angle. As previously described for grounding clip **14,** the spring members **68** are cooperatively disposed in the lower loop **46'** to create a screw receiving means **50'** therebetween. The upper loop **44'** includes symmetrical members **72,** each of which extends in a continuous path from one obtuse angled bend **70** to a first bend **74** through an acute angle in the direction of the lower loop **46',** from the first acute angled bend **74** to a second bend **76** through an acute angle away from the lower loop **46',** and from second acute angled bend **76** to a point of termination.

In use the grounding clip **14'** establishes a very reliable grounding path between the mounting yoke **34** and the mounting screw **22** as described previously for grounding clip **14.** However, as illustrated in FIGS. **8 - 10,** grounding clip **14'** is detachably affixable to the mounting yoke **34** in a different manner than is grounding clip **14.** As shown in FIG. **8,** the symmetrical members **72** are first directed through the slot **40** in the mounting yoke **34** and then the grounding clip **14'** is manipulated to separate the loops **44'** and **46'** across the thickness of the mounting ear **38,** as illustrated in phantom. The mounting screw **22** is then inserted into the screw receiving means **50',** as illustrated in FIG. **9.** Of course, when the mounting screw **22** is tightened, the loops **44'** and **46'** are forced to converge and bear against the mounting ear **38** with the lower loop **46'** interfittingly disposed between the symmetrical members **72,** as illustrated in FIG. **10.** With the loops **44'** and **46'** forcibly converged, it should be realized that the termination on each symmetrical member **72** is forced against the mounting ear **38** with great pressure so that nonconductive substances thereon are penetrated to decrease the electrical contact resistance.

Although it is essential that the lower loop **46'** interfit between the symmetrical members **72,** many different wire-form clip configurations are possible to accomplish this interfit. In these various configurations, the spring members **68** and the symmetrical members **72** can be disposed convergently, divergently, or in parallel on their respective loops **44'** and **46'.** However, the preferred embodiment is illustrated in FIG. **7** where the spring members **68** are disposed in parallel, while the symmetrical members **72** are divergently disposed.

Still another preferred embodiment of a grounding clip **14''** is illustrated in FIGS. **11** and **12** where similar parts to those of FIGS. **1 – 5** are identified by the same reference numerals, but with a double ('') added. The grounding clip **14''** again includes an upper loop **44''** and a lower loop **46''** which are interconnected across a gap **48''** by a bend **78** of substantially 180°. Each loop **44''** or **46''** has a spring member **80** extending from the bend **78** to a bend **82** through an obtuse angle. The obtuse angled bends **82** are disposed in substantially parallel planes and the spring members **80** are cooperatively arranged to create a screw receiving means **50''** therebetween. Because of its simplistic nature, the configuration of grounding clip **14''** can have many variations within the inventive concept. Of course, the obtuse angled bends **82** could be in either the same or opposite directions and could actually be bends of 180°. Furthermore, it is not essential that the obtuse angled bends **82** be disposed in parallel planes and the spring members **80** could be disposed convergently, divergently, or in parallel relative to each other.

Generally, the grounding clip **14''** is detachably affixable to the electrical fixture **10** in the same manner previously described for gounding clip **14** and establishes a reliable grounding path between the mounting yoke **34** and the screw **22.** Of course, the mounting screw **22** is received between the spring members **80** and retains the grounding clip **14''** on the electrical fixture **10,** as illustrated in FIG. **12.** However, the gap **48''** could be of lesser magnitude than the thickness of the mounting yoke **34** and cause the upper and lower loops **44''** and **46''** to bear forcibly thereagainst in retaining the grounding clip **14''** on the electrical fixture **10** without using the mounting screw **22.**

It should be readily appreciated by those skilled in the art that the wire-form grounding clip embodied by this invention is of a simplified configuration and may be detachably affixed on an electrical fixture to provide a very reliable grounding path with a mounting box through a mounting screw. Also, the wire-form configuration can be adapted to exert continual contact pressure against the mounting yoke of the electrical fixture or attain such contact pressure after the mounting screw has been tightened into screw receiving means of

the grounding clip. Furthermore, the terminations of the wire-form configuration can be oriented to either lock the grounding clip on the electrical fixture or to penetrate nonconductive substances thereon in decreasing electrical contact resistance.

It should be understood that the present disclosure has been made only by way of example and that numerous changes in details of construction and the combination or arrangement of parts may be resorted to without departing from the true spirit and scope of the invention. Therefore, the present disclosure should be construed as illustrative rather than limiting.

What I claim is:

1. A grounding clip for use with an electrical fixture of the type having a grounded mounting yoke by which the fixture is secured into a mounting box with mounting screws through slots in the mounting yoke, said grounding clip comprising:

a continuous strand of spring wire, said strand being formed into an upper loop and a lower loop, said upper and lower loops being separated by a gap and being superposingly aligned with said upper loop being configured to provide clearance for threads on the mounting screw and said lower loop being configured to include a screw receiving means for engaging the mounting screw, said upper loop including a first bend of substantially 180° with members extending from each side thereof to a second bend of substantially 180°, said lower loop including symmetrical members with each said symmetrical member extending from one of said second bends to a third bend of substantially 180° and having a spring member extending from said third bend to a point of termination, said symmetrical members being arranged in said lower loop with said spring members cooperating to create said screw receiving means therebetween, each said spring member being terminated with an inclined tip, said inclined tips being disposed to locate in the slot of the mounting yoke and thereby retain said grounding clip on the electrical fixture, said grounding clip being detachably affixable on the electrical fixture with the mounting yoke thereof disposed in said gap and said screw receiving means aligned through one of the slots in the mounting yoke, said upper and lower loops being forcibly convergent against the mounting yoke to bear thereagainst when the mounting screw is tightened in said screw receiving means.

2. In combination, a grounding clip and an electrical fixture; said electrical fixture being of the type having a grounded mounting yoke with mounting slots formed therein whereby the fixture is arranged to be secured in a mounting box by mounting screws which extend through said slots; and said ground clip comprising a continuous strand of spring wire having end terminations, said strand being formed into an upper loop and a lower loop, said upper and lower loops being separated by a gap and being superposingly aligned to create a screw receiving means therebetween for engaging a mounting screw, said terminations affixingly in none mounting yoke slot when said grounding clip is disposed on the electrical fixture with the mounting yoke thereof disposed in said gap and said screw receiving means aligned through the slot, said upper and lower loops being forced to converge against the mounting yoke thereafter when the mounting screw is tightened in said screw receiving means.

3. The combination of claim 2 wherein said gap is of lesser magnitude than the thickness of the mounting yoke, said grounding clip being detachably affixable on the mounting yoke with said upper and lower loops continually bearing forcibly thereagainst to establish electrical continuity between said grounding clip and the electrical fixture.

4. The combination of claim 2 wherein said upper loop is configured to provide clearance for threads on the mounting screw and said lower loop is configured to include said screw receiving means.

5. The combination of claim 4 wherein said upper loop includes a first bend of substantially 180° with members extending from each side thereof to a second bend of substantially 180°, and said lower loop includes symmetrical members with each said symmetrical member extending from one of said second bends to a third bend of substantially 180° and having a spring member extending from said third bend to a point of termination, said symmetrical members being arranged in said lower loop with said spring members cooperating to create said screw receiving means therebetween.

6. The combination of claim 5 wherein said gap is of lesser magnitude than the thickness of the mounting yoke, said grounding clip being detachably affixable on the mounting yoke with said upper and lower loops continually bearing forcibly thereagainst to establish electrical continuity between said grounding clip and the electrical fixture.

7. The combination of claim 4 wherein said lower loop includes a bend of substantially 180° with spring members extending from each side thereof to separate bends through equal obtuse angles, said spring members being cooperatively arranged in said lower loop to create said screw receiving means therebetween; and said upper loop includes symmetrical members with each said symmetrical member extending in a continuous path from one of said obtuse angled bends to a first bend through an acute angle in the direction of said lower loop, from said first acute angled bend to a second bend through an acute angle away from said lower loop, and from said second acute angled bend to a point of termination; said grounding clip being detachably affixable on the electrical fixture with said symmetrical members extending through the slot in the mounting yoke to bear against the underside thereof and said lower loop interfitting between said symmetrical members when the mounting screw is tightened in said screw receiving means.

8. The combination of claim 2 wherein said loops are interconnected across said gap by a first bend of substantially 180 degrees, each said loop being a spring member which extends from said first bend to a bend through an obtuse angle at one termination of said strand, said spring members being cooperatively arranged to create said screw receiving means therebetween.

9. The combination of claim 8 wherein said gap is of lesser magnitude than the thickness of the mounting yoke, said grounding clip being detachably affixable on the mounting yoke with said upper and lower loops continually bearing forcibly thereagainst to establish electrical continuity between said grounding clip and the electrical fixture.

10. A grounding clip for use with an electrical fixture of the type having a grounded mounting yoke by which the fixture is secured into a mounting box with mounting screws through slots in the mounting yoke, said grounding clip comprising:

a continuous strand of spring wire, said strand being formed into an upper loop and a lower loop, said upper loop including a first bend of 180° in a first plane and having members extending from each side of said first bend to a second bend of 180° in a second plane perpendicular to said first plane, said lower loop including symmetrical members, each said symmetrical member extending from one of said second bends to a third bend of 180° in a third plane parallel to said first plane and having a spring member extending from said third bend to a point of termination, said symmetrical members being arranged in said lower loop with said spring members cooperating to create said screw receiving means therebetween, said upper and lower loops being separated by a gap and being superposingly aligned to pass the mounting screw through said screw receiving means, said grounding clip being detachably affixable on the electrical fixture with the mounting yoke thereof disposed in said gap and said screw receiving means aligned through one of the slots in the mounting yoke, said upper and lower loops being forcibly convergent against the mounting yoke to bear thereagainst when the mounting screw is tightened in said screw receiving means.

11. The grounding clip of claim 10 wherein said gap is of lesser than the thickness of the mounting yoke, said groundiing clip being detachably affixable on the mounting yoke with upper and lower loops continually bearing forcibly thereagainst to establish electrical continuity between said grounding clip and the electrical fixture.

12. The grounding clip of claim 10 wherein each said spring member is terminated with an inclined tip, said inclined tips being disposed to locate in the slot of the mounting yoke and thereby retain said grounding clip on the electrical fixture.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,890,026
DATED : June 17, 1975
INVENTOR(S) : Albert J. Gartland, Jr.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 7, line 58 (Claim 2, line 6), "ground" should be --grounding--. See Amendment dated December 3, 1974 (Claim 1, line 7).

Column 7, line 64 (Claim 2, line 12), "affixingly in none" should be --affixingly engaging in one--. See Amendment dated December 3, 1974 (Claim 1, line 14).

Column 10, line 11 (Claim 11, line 2), after "lesser" insert --magnitude--. See specification Claim 11, line 2, as filed.

Column 10, line 12 (Claim 11, line 3), "groundiing" should be --grounding--. See specification, Claim 11, line 3, as filed.

Signed and Sealed this

second **Day of** *December 1975*

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks