United States Patent [19]

Barnes

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[54] **LOCK NUT DRIVE HEAD**

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[52] U.S. Cl. ..... **81/90 B,** 81/121 A

[51] **Int. Cl.** **B25b 13/48**

[58] **Field of Search** ..... 81/90 R, 90 B, 90 C, 81/90 D, 90 E, 90 F, 119, 120, 121 A

[56] **References Cited**

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Primary Examiner—Othell M. Simpson
Assistant Examiner—James G. Smith
Attorney—David S. Fishman et al.

[57] **ABSTRACT**

A spanner type drive head is presented for serrated lock nuts used in electrical terminal blocks, the drive head having teeth for mating with the serrations of the lock nut and also having an aperture or mouth to accommodate electrical cable in the terminal box.

3 Claims, 7 Drawing Figures

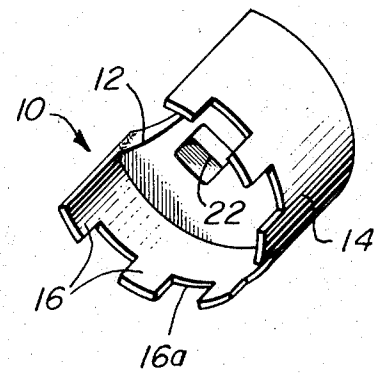


FIG. 1

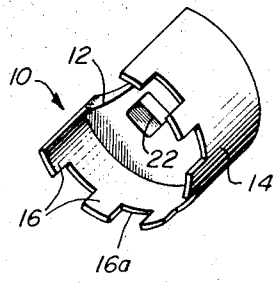


FIG. 5

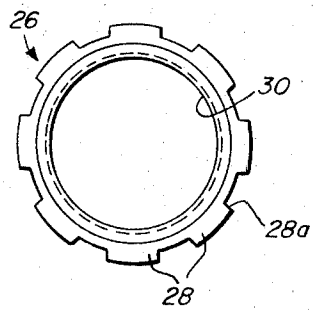


FIG. 2

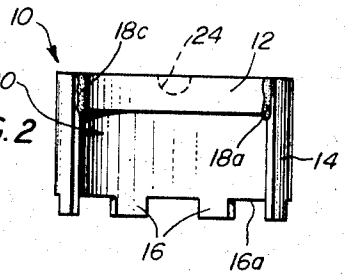


FIG. 4

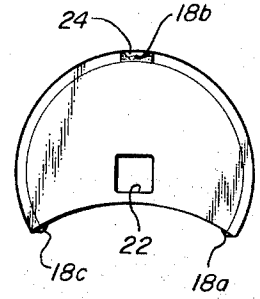


FIG. 3

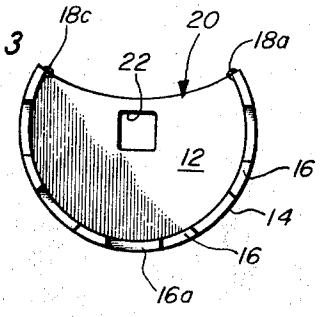


FIG. 6

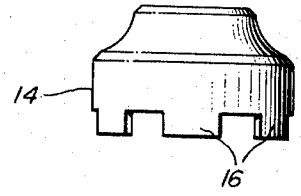
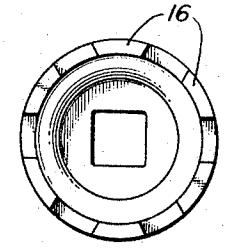


FIG. 7



LOCK NUT DRIVE HEAD

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to the field of hand held driving tools. More particularly, this invention relates to the field of hand tools for use in the electrical industry for assembling or disassembling terminal box connections.

2 Description of the Prior Art

Electrical circuit termination equipment such as terminal boxes and fuse boxes commonly found in household and other building construction have for many years employed a serrated lock nut for securing electrical cable such as armored cable or Romex Cable to the terminal box or fuse box. The lock nut has a series of spaced serrations or teeth on the outer periphery thereof, and some or all of the teeth are inclined or skewed at a slight angle to provide a biting surface for biting engagment with the terminal box whereby a safety ground path is provided in the event of short circuit in the cable. When mounted in place, the central opening of the lock nut surrounds the entry aperture to which the cable enters or leaves the terminal box and internal threads on the lock nut engage a threaded sleeve mounted on the cable. In the past it has been standard procedure to manually mount the lock nut in place on the interior side of the terminal box and bring it up to finger tightness. Then, typically, tightening force is applied by placing a screwdriver or other similar instrument at the side of one of the serrations and delivering impact blows to the screwdriver by means of a hammer or other device. Substantial tightening forces must be applied in this manner in order to insure that the teeth of the lock nut will bite into the body of the terminal box and provide the desired ground connection. Loosening or removal of the lock nut is, typically, accomplished by the same procedure of delivering impact blows through the hammer and screw driver in a direction tending to unscrew the lock nut. In many situations, especially those which the lock nut has been seated for extended periods of time, substantial difficulty is encountered in loosening and removing the lock nut. In any event, the hammer and screw driver approach is at best awkward and clumsy, and can sometimes lead to injury from slipping of the screw driver or a missed blow.

The preceding prior art discussion has been directed to the typical configuration wherein the lock nut is mounted on the side of a terminal box whereby easy access may be had for the screw driver and hammer operation. However, in some instances the lock nut is located in the bottom of a deep box and there is no way to operate with the hammer and screwdriver to effect tightening. In such situations, the nut is only finger tightened, and thus the ground connection is not effectively made.

SUMMARY OF THE INVENTION

The present invention discloses a lock nut drive head which eliminates the need to resort to the awkward and dangerous hammer and screw driver impact approach of the prior art and enables safe, simple and sure operation for either seating or unseating the lock nut. The lock nut drive head of the present invention is a spanner type device having a depending annular skirt with teeth thereon adapted to fit between the serrations or teeth of the lock nut. The drive head can be engaged,

such as in snap-on fashion, by a ratchet or other type wrench so that clockwise or counter clockwise motion can be imparted to the lock nut to either seat or unseat it. An aperture is provided in the depending skirt of the drive head so that the head can be fitted over or around the cable in the interior of the terminal box.

Accordingly, one object of the present invention is to provide a novel and improved drive head for lock nuts used in electrical terminal connections.

Another object of the present invention is to provide a novel and improved drive head for lock nuts whereby safe, simple and effective engagement and driving of a lock nut is assured.

Other objects and advantages will be apparent and understood to those skilled in the art from the following detailed description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the drawings, wherein like elements are numbered alike in the several figures:

FIG. **1** is a perspective view of the lock nut drive head of the present invention.

FIG. **2** is a front elevation view of the lock nut drive head.

FIG. **3** is a bottom plan view of the lock nut drive head of FIG. **2.**

FIG. **4** is a top plan view of the lock nut drive head of FIG. **2.**

FIG. **5** is a top plan view of a typical serrated lock nut upon which the drive head is intended to operate.

FIG. **6** is an elevation view of an alternate embodiment of the lock nut drive head.

FIG. **7** is a bottom plan view of the configuration of FIG. **6.**

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. **1,** the lock nut drive head indicated generally at **10** has a top portion **12** and a depending side skirt **14.** Skirt **14** has a plurality of teeth **16** extending from the end of the skirt removed from top **12** with spacer **16***a* therebetween the teeth **16** being equally spaced apart about skirt **14.** As can best be seen in FIG. **2,** top **12** and skirt **14** are two separate elements which are joined together at welds **18***a*, **18***b*, and **18***c*.

As can best be seen from the perspective view of FIG. **1** and in the bottom plan view of FIG. **3,** skirt **14** is generally annular in shape but extends less than a full 360°, and top **12** is generally circular in shape but less than a full circle. Skirt **14** and top **12** cooperate to form a mouth or aperture **20** leading into the interior of the lock nut drive head. Referring now to FIG. **4,** a square opening **22** in top **12** forms a receptacle for receiving the snap-on element or similar connecting lug of a ratchet wrench for operation of the lock nut drive head. Also referring to FIG. **4,** and is also seen in FIG. **2,** a semi-circular recess **24** is formed in the top of skirt **14,** and this semi-circular recess is filled with weld material and serves to fuse skirt **14** to the top **12** at this location of weld **18***b* to firmly join the skirt and top together with considerably more dependability than would otherwise be the case with just welds **18***a* and **18***c* which are more in the nature of spot welds.

Referring now to FIG. **5,** a lock nut **26** is shown, lock nut **26** being a typical serrated type of lock nut on which the drive head of the present invention is intended to be used. Lock nut **26** has a series of project-

ing teeth **28** extending radially outward from nut **26** with spaces **28***a* therebetween, teeth **28** being equally spaced apart about the periphery of the nut. A series of lock nuts of the type shown in FIG. **5** are presently commercially available in a range of standard sizes, there being a standard number of teeth with standard intertooth spacing depending on the size of the nut. The present invention contemplates a series of lock nut drive head elements **10** of different sizes and with different sized teeth **16** and intertooth spacing to conform with the range of standard lock nuts commercially available.

As can readily be seen and understood by those skilled in the art, for any particular size lock nut **26** an appropriately sized lock nut drive head **10** can be brought into engagement with the lock nut **26** so that the teeth **16** of the drive head mate with the intertooth spaces **28***a* of the nut and the intertooth spaces **16***a* of the head mate with the teeth **28** of the nut. When thus brought into engagement with the lock nut, the drive head is then in a position to either tighten or loosen the lock nut when rotated either clockwise or counterclockwise (depending on the threading at the interior circular opening **30** of the locknut). The attachment lug or other similar connecting device of a ratchet or other similar driving instrument would be seated in opening **22** to provide the driving force to drive head **10** when engaged with nut **26.** In the prior art situation discussed above wherein the nut is at the bottom of a deep box, appropriate exterior arms can be used to connect the drive head to the driving instrument.

Bearing in mind that electrical cable extends through opening **30,** the significance of aperture **20** will become understood and clear. Aperture **20** accommodates the cable when the drive head is brought into engagement with the lock nut so that the cable (not shown) in the center of the lock nut can be accommodated by the interior cavity of the drive head and aperture **20** whereby the drive head can be brought into driving engagement with the nut without interference with the cable.

Referring now to FIGS. **6** and **7,** a second, but less desirable, embodiment of the present invention is shown wherein the teeth **16** extend around the entire skirt **14.** Since this configuration shown in FIGS. **6** and **7** does not have an aperture to accommodate cable, its utility would be limited to those situations in which only strands of light wire extend beyond the lock nut into the junction box, and care would have to be taken to avoid any crimping or cutting of such wire strands when the drive head is brought into engagement with the lock nut.

While preferred embodiments have been shown and described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the present invention has been described by way of illustration and not limitation.

What is claimed is:

1. A lock nut drive head including:

a body having a top portion;

a side skirt depending from said top portion, said top and said side skirt cooperating to define an interior cavity;

an aperture defined in said side skirt and said top portion, said aperture and said interior cavity being adapted to accomodate a cable extending through a lock nut; and

a plurality of spaced teeth depending from said skirt at the end thereof removed from said top portion, said teeth being equally spaced apart about said skirt commensurate with spacings on a lock nut and being adapted to for driving engagement with a serrated lock nut.

2. A lock nut drive head as in claim **1** including:

an opening in said top portion to receive a driving tool.

3. A lock nut drive head as in claim **1** wherein said top portion and said skirt are separate elements welded together, said skirt having a recess at at least one location filled with weld material fusing said skirt to said top.

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