July 9, 1968 G. MATHES 3,391,842

APPARATUS FOR APPLYING CABLE CLAMPS

Filed Dec. 6, 1965 2 Sheets-Sheet 1

FIG. 1.

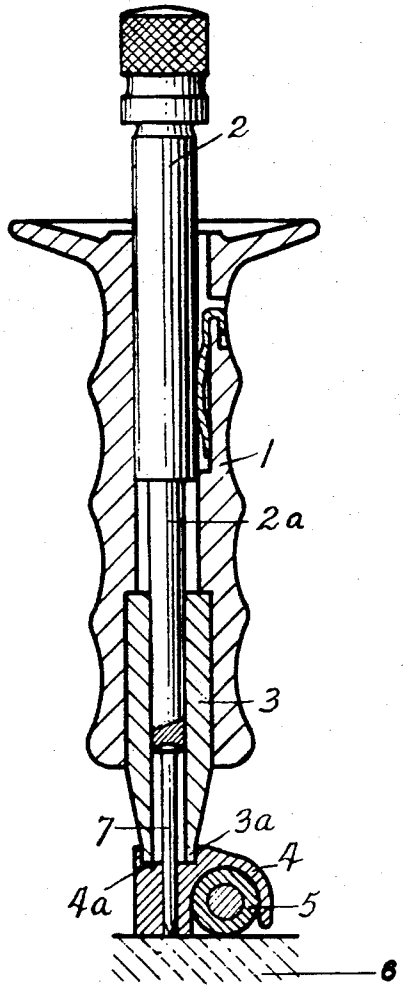
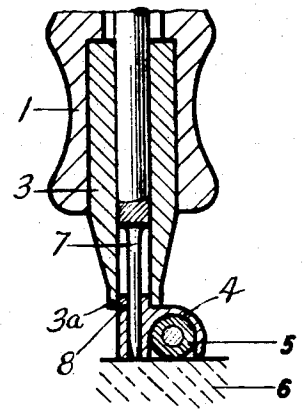


FIG. 4



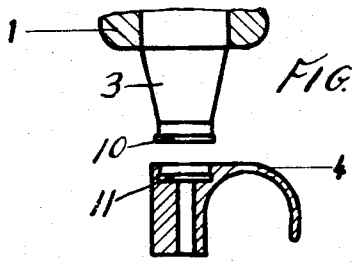


FIG. 5

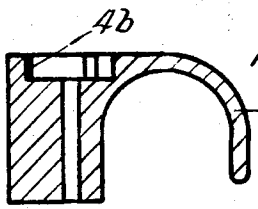


FIG. 2.

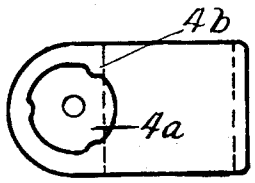


FIG. 3.

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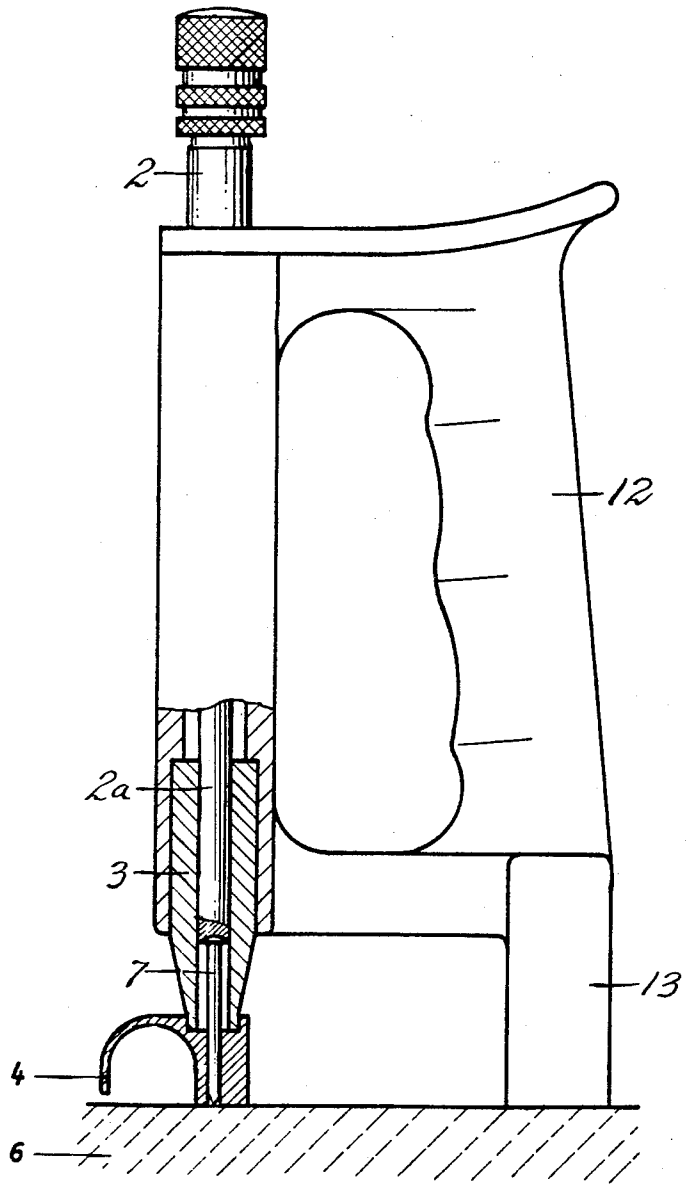

Fig. 6

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APPARATUS FOR APPLYING CABLE CLAMPS

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7 Claims. (Cl. 227—147)

ABSTRACT OF THE DISCLOSURE

A nail driving apparatus for mounting a cable clamp on a surface is disclosed as including a guide sleeve forming a handle and slidably receiving a driver. The driver has a reduced diameter striker at its lower end, and which is interchangeable for replacement, the striker being slidably engaged in a tubular extension inserted into a recess in the lower or inner end of the sleeve.

The extension has a formation frictionally engageable with a mating formation on a cable clamp which has a nail receiving hole alignable with the striker and with a nail having a sliding fit in the tubular extension. The feature of the disclosure is that the nail driving apparatus is useable interchangeably with clamps of various sizes.

Background of the invention

The present invention relates to apparatus for mounting cables and more particularly to an apparatus for applying cable clamps to a wall or other surface by means of fastening nails.

Devices have heretofore been provided for attaching cable clamps to a wall with fastening nails in which the guide sleeve of the device is provided with a recess for receiving clamps which are detachably connected thereto by a laterally acting spring-holding means. The radial spring forces of such devices do not clamp on the tool with sufficient rigidity to properly guide the nail, and especially when the nail is being driven into a hard material and requires a rigid bottom guide. The frequent widening of the recess and compression of the springs when each new clamp is inserted results in early fatigue of the spring material. The springs then must be replaced, which is not only expensive, but results in a cumbersome and time-consuming operation in the tools available. In addition, the driving tool is limited in use to one shape and size of clamp and the insertion of the clamp into such known tools is made difficult by the necessity of flexing or cocking the spring. For these reasons, such tools have not acquired any commercial success and most craftsmen have gone back to holding the clamps individually by hand and to hitting the nails directly with the hammer. As the cable to be laid must be held by hand while the fastening nails are being driven, it has been found particularly difficult to drive the nails when very small clamps are to be fastened in places where access is difficult, such as in corners or recesses.

The object of the present invention is to provide an improved driving tool and cable clamp so constructed as to avoid the above disadvantages and facilitate the easy, quick and dependable fastening of even very small clamps on hard material and in places of difficult accessibility.

In accordance with the present invention, a driver is provided with a guide sleeve having a tubular extension at its lower end so constructed as to mount a cable clamp thereon with a friction fit concentrically with a nail to be driven and a nail hole in the clamp so that the hole in the clamp provides a rigid guide for the nail while it is being driven to attach the clamp to a wall or other surface.

The tubular extension of the guide sleeve of the driver and the cable clamp frictionally engage each other and

one of the parts is provided with symmetrically arranged bosses. Preferably, the cable clamp is provided with a recess in its top surface in the form of a blind hole concentric with the nail hole and having inwardly projecting bosses equally spaced around the periphery of the hole for frictional engagement with the outer periphery of the tubular extension of the driver.

However, the cable clamp may have a pin-like extension to project into the tubular extension of the driver, the pin-like extension being concentric to the nail hole through which the nail is to be driven.

Also, the cable clamps are preferably made of a plastic material and a nail is provided for each clamp when it is attached to the driver so that the clamp may be mounted on the extension of the driver with a press fit. When the cable clamps are made of a plastic material they may be fabricated advantageously by extrusion into a bar with scoring between the individual clamps so that individual clamps may be separated from the bar.

The invention will now be explained in further detail with respect to the drawings in which a preferred embodiment is shown by way of example.

In the drawings:

FIGURE 1 is a longitudinal sectional view through a driving tool and clamp to show the manner in which the clamp is mounted on the driver prior to fastening in accordance with the present invention;

FIGURE 2 is an enlarged sectional view of the cable clamp shown in FIGURE 1 and illustrating the recess therein for receiving the end of the driver;

FIGURE 3 is a plan view of the clamp illustrated in FIGURE 2, and showing the peripheral bosses projecting inwardly from the periphery of the recess therein;

FIGURE 4 is a sectional view of another embodiment of tool in which a pin-like projection on the cable clamp projects into the interior of a tubular projection on the driver;

FIGURE 5 is an elevational view of a tool and clamp of further modified construction in accordance with the invention; and

FIGURE 6 is a side elevational view, partly in section, of a driver and cable clamp of a still further modified construction.

As can be observed in FIGURE 1, the nail driving device has a guide sleeve **1** in the form of a handle and into which a driver **2** extends. The driver **2** has a striker *2a* at its lower end of smaller diameter which is interchangeable for replacement and is supported for sliding movement in a tubular extension **3** at the lower end of the guide sleeve **1**. A cable clamp, designated generally as **4**, for holding a cable **5** on a wall **6** or other surface, is shown detachably mounted on the lower end *3a* of the tubular extension **3**. Cable clamp **4** is in the form of a strap having a body portion or sleeve and a curved arm projecting laterally from the sleeve to overlie the cable **5** to be clamped to the wall **6**, and the body portion or sleeve is provided with a blind-hole recess *4a* into which the end *3a* of the tubular extension is inserted with a force fit. The head of a fastening nail **7** rests against the lower end of the striker insert *2a* and its lower shank part extends through a hole in the body portion of the clamp **4** which firmly guides it while it is being driven.

In FIGURES 2 and 3 the clamp **4** is shown on an enlarged scale and it can be seen that the body portion of the clamp is provided with friction bosses *4b* projecting inwardly from the periphery of the recess hole *4a*. It is to be understood, however, that the bosses may be provided on the outer periphery of the tubular extension and project outwardly into engagement with the clamp **4**. When the clamp **4** is made of a plastic material it will have a certain amount of elasticity so that the bosses *4b* are not essential.

In the embodiment of the invention shown in FIGURE 4, the clamp **4** has a pin-shaped extension **8** which extends into the interior of the tubular extension **3** of the driving device **1**.

In FIGURE 5 the tubular extension **3** of the driving device **1** is formed at its lower end with a laterally projecting flange **10** which can be snapped into a corresponding recess **11** in the clamp **4** to more positively support the clamp on the driving device **1**.

In FIGURE 6 a tool of modified construction is shown having a handle **12** with a spacer **13** provided below the handle **12** to provide a two point support while the clamp is being attached to a supporting surface. A tool provided with this handle facilitates the attachment of clamps in corners and at places directly below a ceiling which have particularly difficult access.

While several embodiments of the invention are herein illustrated and described, it will be understood that further changes may be made in the construction and arrangement of elements without departing from the spirit or scope of the invention. Therefore, without limitation in this respect the invention is defined by the following claims.

I claim:

1. Apparatus for securing, to a surface, cable clamps of different sizes each in the form of a strap including a body portion and a curved arm projecting from the body portion to overlie a cable to be clamped, and with the body portion having an inner end, to engage the surface, and an outer end, and formed with a relatively elongated hole extending between the inner and outer ends and receiving and rigidly guiding a headed fastener for anchoring the clamp to the surface, the outer end of the body portion being formed with a substantially cylindrical surface concentric and coaxial with the hole and the cylindrical surfaces of all the clamps being substantially equal in diameter, said apparatus comprising, in combination, a driver having a guide sleeve with a tubular extension for guiding engagement with the fastener; and a striker reciprocable in said sleeve for driving the fastener; the outer end of said tubular extension having a substantially cylindrical surface releasably frictionally engageable with the cylindrical surface on the outer end of a clamp body portion to retain the clamp on said driver during securing of the clamp to said surface.

2. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **1**, for use in securing such clamps having at least the body portion formed of yielding material; said substantially cylindrical surface on the outer end of said tubular extension having a releasable frictional engagement with the cylindrical surface on the outer end of a clamp body by virtue of yielding of the material of the clamp body.

3. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **1**, for use with such clamps in which the cylindrical surface of the clamp is the peripheral surface of a cylindrical recess in the outer end of the body portion of the clamp and concentric and coaxial with the hole therethrough; said cylindrical surface on the outer end of said tubular extension comprising a radially outer cylindrical surface of said tubular extension,

4. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **2**, for use with such clamps in which the cylindrical surface on the outer end of the body portion constitutes the peripheral surface of a cylindrical recess concentric and coaxial with the hole in the body portion, with such peripheral surface having radially inwardly projecting and circumferentially spaced bosses; said cylindrical surface on the outer end of said tubular extension having releasable frictional engagement with such peripheral surface by yielding of the material of the body portion of the clamp.

5. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **2**, for use with such clamps in which the cylindrical surface on the outer end of the body portion is the peripheral surface of a cylindrical recess formed in the outer end of the body portion and concentric and coaxial with the hole in the body portion, the cylindrical recess having a radially outwardly extending annular recess adjacent its inner end; said cylindrical surface on the outer end of said tubular extension having a radially outwardly projecting rib at its outer end engageable in the annular recess of the body portion of a clamp by yielding of the material of the body portion, whereby to provide a detachable snap connection between said driver and a clamp.

6. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **1**, for use with such clamps in which the cylindrical surface on the outer end of the body portion thereof constitutes the outer peripheral surface of a tubular boss on the outer end of the body portion concentric and coaxial with the hole through the body portion; said cylindrical surface on the outer end of said tubular extension constituting a radially inner surface of said tubular extension arranged to releasably frictionally embrace the cylindrical surface on the outer end of the body portion of a clamp.

7. Apparatus for securing different sized cable clamps to a surface, as claimed in claim **1**, in which said driver further includes a handle portion extending laterally from said guide sleeve, said handle portion including a spacer extending therefrom in laterally spaced substantially parallel relation to said guide sleeve and in the fastener driving direction; the length of said spacer being such that the outer end of said spacer engages such surface when the inner end of the body portion of a clamp, retained on said driver, is engaged with such surface, whereby to provide a two-point support while the clamp is being secured to such surface.

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