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2,351,232

STUD SETTING AND REMOVING TOOL

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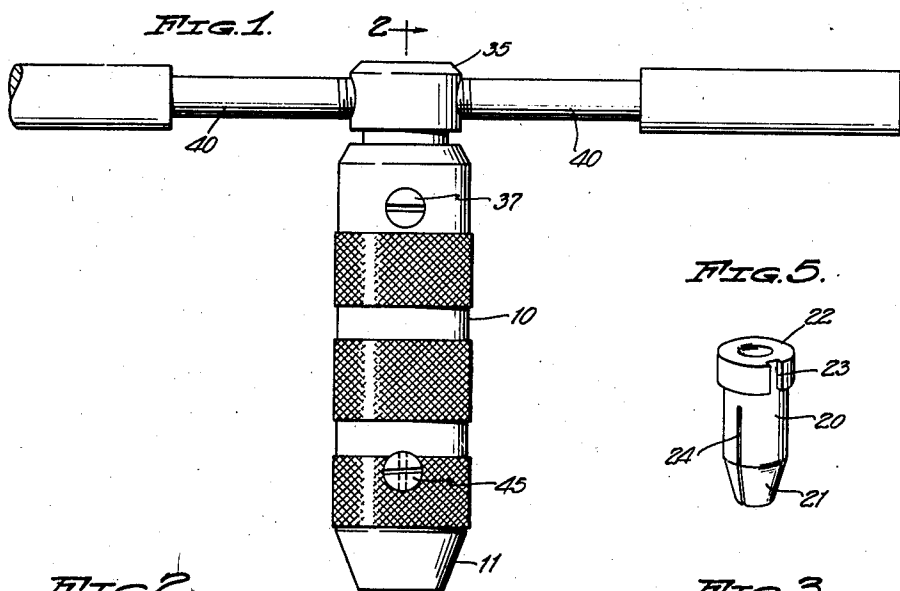


FIG. 5.

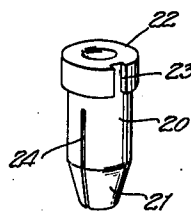


FIG. 2.

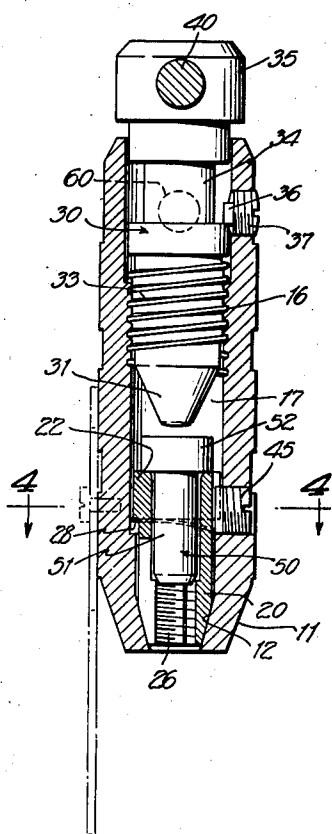


FIG. 3.

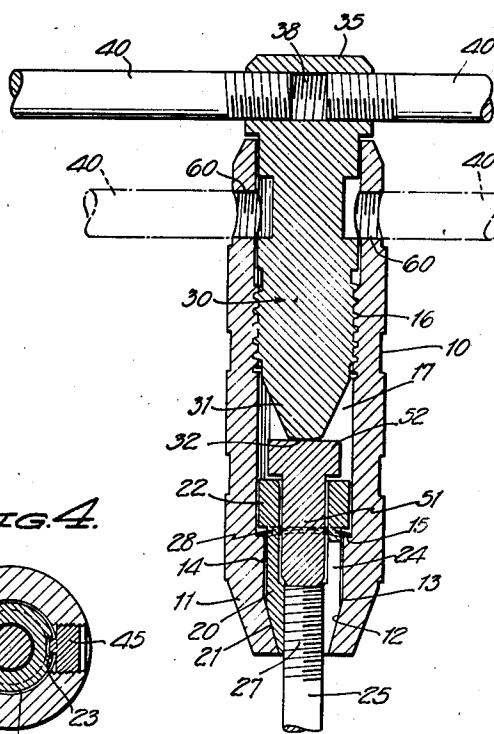
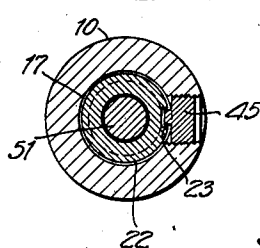


FIG. 4.



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STUD SETTING AND REMOVING TOOL

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2 Claims. (Cl. 81—113)

This invention relates to new and useful improvements in tools for setting and removing studs of the type which consists of an elongated body having a thread at each end and which cannot be operated by means of wrenches or tools of ordinary types.

It is one object of the invention to provide a device of the afore-mentioned character which may be employed either to set or remove a stud with respect to a machine or similar part.

It is a further object of the invention to provide such a tool which has a minimum number of parts and which is simple and positive in its operation.

It is a still further object of the invention to provide such a tool which may be operated either by hand or power.

With the above and other objects in view, the nature of which will become apparent as the invention is better understood, reference will now be had to the accompanying drawing, specification and claims in which the invention is illustrated in one of its preferred forms.

In the drawing,

Figure 1 is a view in elevation of a tool constructed in accordance with the present invention.

Figure 2 is a longitudinal sectional view on a slightly enlarged scale, taken substantially on the line 2—2 of Figure 1, showing the several parts of the tool in their released positions.

Figure 3 is a longitudinal sectional view on a slightly enlarged scale taken in a plane substantially at right angles to the plane of Figure 2, showing the several parts in their operating positions.

Figure 4 is a transverse sectional view taken substantially on the line 4—4 of Figure 2, and;

Figure 5 is a detail perspective view of one of the parts of the tool.

Referring to the drawing, the reference numeral 10 designates a casing in which the several parts of the tool are mounted. This casing is of elongated cylindrical form and preferably has one end slightly tapered as indicated at 11.

The tapered end 11 of the casing is provided upon its interior with a tapered seat 12, the purpose of which will be hereinafter set forth. From the base 13 of the tapered seat 12, the inner walls of the casing 10 recede as at 14 to provide a straight passage which terminates in an annular shoulder 15.

From the shoulder 15, the inner walls of the casing recede to form a passage 17 which extends to the opposite end of the casing 10 which end is

open. An internal thread 16 is formed in this passage, the purpose of which will be hereinafter specifically set forth.

The reference character 20 designates a stud gripping and holding element and is shown in detail in Figure 5 of the drawing.

The stud gripping and holding element 20 comprises a sleeve-like body portion having a tapered seat 21 at one end thereof. Upon its other end it has a flange 22 which is cut out as at 23 and extending longitudinally of the sleeve-like body portion, there is a plurality of slits 24 which provide sufficient resiliency of the body portion to permit of its contraction into gripping engagement with a stud such as illustrated at 25 in Figure 3.

As illustrated in Figure 2 of the drawing, this stud gripping and holding element is provided with an interior thread 26 for threaded engagement with the threaded portion 27 of the stud 25 as illustrated in Figure 3 of the drawing.

As illustrated in both Figures 2 and 3 of the drawing, the stud gripping and holding element is positioned in the tapered end of the casing, it being placed in such position by inserting it into the open end of the casing through the passage 17, the flange 22 preventing it passing entirely through the casing. Interposed between the flange 22 and the shoulder 15, there is a spring washer 28 which rests upon said shoulder and against which the flange 22 engages.

The reference character 30 designates a driving plug by means of which the tool is firmly engaged with a stud to be operated upon.

This driving plug comprises an elongated body portion having a tapered end 31 which terminates in a nose 32, the purpose of which will be hereinafter specifically described, and intermediate of its ends it is provided with a thread 33 for threaded engagement with the thread 16 of the casing 10.

The driving plug 30 is also provided with a reduced portion 34 into which extends a projection 36 carried by a screw 37 which is threaded in the casing 10 and serves, when in position, to retain the driving plug 30 within the casing and to limit its longitudinal movement in one direction relatively thereto.

Upon its outer end which projects beyond the open end of the casing, the driving plug is provided with a head 35 having a threaded passage 38 into which two operating handles 40 may be threaded as illustrated in Figure 3 of the drawing.

Interposed between the inner end of the stud gripping and holding element 20 and the driv-

ing plug 30, there is a driving pin 50. This driving pin has an elongated body portion 51 adapted to be received within the sleeve-like stud gripping and holding element 20 and an enlarged head 52 which engages the inner end or flange 20 of said stud gripping and holding element.

The manner in which the tool is employed to set a stud will now be described.

In Figure 2 of the drawing, the tool is illustrated with all of its parts in their released positions.

In this figure, the stud gripping and holding element 20 is merely resting upon the spring washer 28 with the nose 32 of the driving plug 30 retracted slightly from engagement with the inner end of the driving pin 50.

With the parts in the aforementioned positions, the threaded portion 27 of the stud 25 is passed into the tapered end of the casing and into threaded engagement with the thread 26 of the stud gripping and holding element 20. During this operation, the stud gripping and holding element 20 is prevented from rotation by means of a screw 45 threaded into the casing 10, the inner end of which engages in the cutout portion 23 of the flange 22 as illustrated in Figure 2.

The stud 25 is threaded into the stud gripping and holding element 20 preferably, although not necessarily, until it engages the driving pin 50 in which position it is shown in Figure 3 of the drawing.

The casing 10 is now grasped in one hand and the operating handles turned to rotate the driving plug 30 in the casing 10. Upon rotation of the driving plug in the proper direction, the threads 16 and 33 advance it into engagement with the driving pin 50 which by reason of engagement of its head 22 with the inner end of the stud gripping and holding element 20, forces its tapered seat 21 into engagement with the tapered seat 12 of the casing thus effecting a contraction of the stud gripping and holding element into firm holding engagement with the stud.

Now, by rotation of the casing through the medium of the operating handles 40 the stud may be turned home in its threaded recess and it will be noted that during this operation, the tendency is at all times more firmly to grip the stud as it is turned home.

When the stud has been set, the tool may be readily removed from the stud merely by rotation of the operating handles in the reverse direction, backing out the driving plug 30 and permitting the spring washer 28 to retract the stud gripping and holding element 20 from engagement with the tapered seat 12 of the casing to release its gripping action upon the stud and permitting unscrewing of the tool to completely separate it from the stud 25.

The tool may also be employed to remove a stud and its manner of use in this connection will now be described.

To remove a set stud, the tapered end of the tool is engaged with the exposed threaded end of the stud and the tool rotated to effect threaded engagement of the stud gripping and holding element 20 with the stud. The operating handles are next rotated to rotate the driving plug 30 and move it into engagement with the driving pin 50 to move the stud gripping and

holding element 20 into engagement with the tapered seat 12 of the casing 10 to effect its contraction into gripping engagement with the stud.

It will be understood that to accomplish each of the foregoing operations, the tool must be rotated in the same direction as in setting a stud. It will also be obvious that to remove a set stud, the tool must be rotated in the reverse direction which operation, were the operating handles 10 left in engagement with the driving plug, would merely result in backing out the driving plug and loosening the grip of the stud gripping and holding element 20 upon the stud.

It will be obvious, however, that if, after the tool has been attached to the stud as heretofore described, the casing 10 may be rotated in the proper direction to loosen the stud without disturbing the grip of the stud gripping and holding element upon the stud.

To rotate the casing 10 in the proper direction to remove the stud, the operating handles 40 are disconnected from the driving plug 30 and engaged in the threaded openings 60 in the casing 10 as illustrated in dot and dash lines in Figure 3 of the drawing.

From the foregoing it will be apparent that the present invention provides a new and improved tool of the character described, in which the several objects recited are accomplished.

Having thus described the invention, what is claimed is:

1. A tool of the type described comprising in combination, a cylindrical casing open throughout its length, a tapered seat within said casing at one end thereof, a shoulder within said casing inwardly of said tapered seat, an internally screw threaded split sleeve slidably mounted in said casing for threading and gripping engagement with a stud, a tapered seat provided at one end of said sleeve complementary to said first mentioned tapered seat for engagement therewith for contracting said sleeve into gripping engagement with a stud, an enlarged head at the other end of said sleeve integral therewith and disposed adjacent said shoulder, a resilient spring washer surrounding said sleeve and interposed between said head and said shoulder to normally urge the seat of the sleeve away from the seat on the casing, means preventing rotation of the sleeve relative to said casing, a driving pin slidably mounted in said split sleeve and having an enlarged head disposed beyond the enlarged head of said sleeve, a driving plug threaded within said casing, a tapered driving portion formed in the inner end of said driving plug axially with respect to the head of the driving pin, and handle means provided on the outer end of said driving plug for normally imparting rotation thereto to effect threading movement of the plug inwardly to cause the driving portion thereof to forcibly engage the head of the driving pin and subsequently slide the sleeve to cause the tapered seat thereof to wedgingly engage the tapered seat of the casing to effect a contraction of the split sleeve about a stud to be gripped.

2. A tool of the type described as set forth in claim 1, including stop means for limiting the outward threading movement of the driving plug relative to the casing.

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