May 22, 1956 R. A. VALVANO 2,746,328

STUD PULLER AND DRIVER WRENCH

Filed Sept. 14, 1953

FIG. 1.

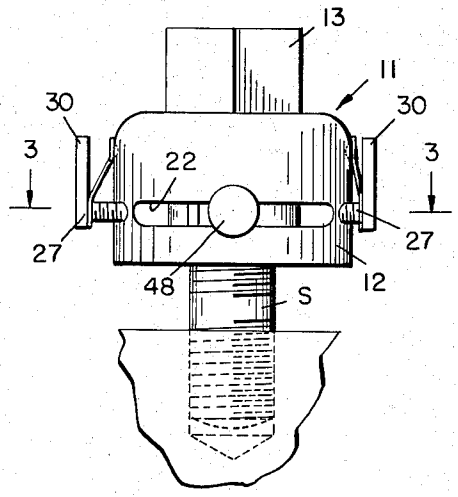


FIG. 2.

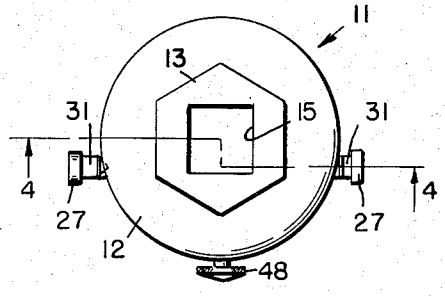


FIG. 3.

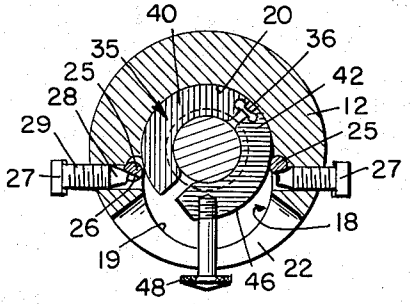


FIG. 4.

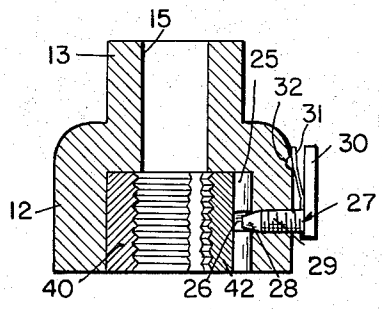


FIG. 5.

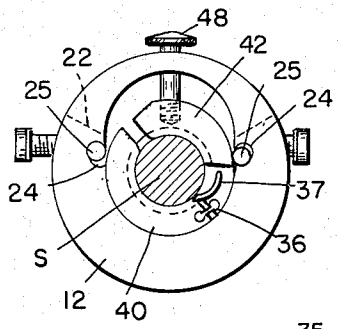


FIG. 6.

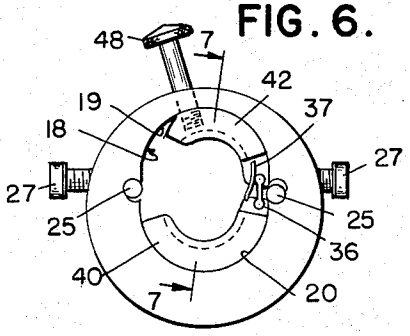
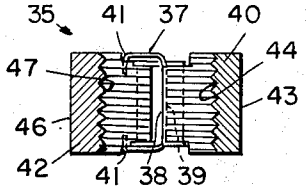


FIG. 7.



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STUD PULLER AND DRIVER WRENCH

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9 Claims. (Cl. 81—53)

This invention relates to tools used for driving and pulling studs or stud bolts and the like.

An object of the invention is to provide an improved wrench for pulling and driving studs which is easy to operate and which effectively grips the studs.

Another object is to provide a stud puller and driver wrench which can be readily released from tight gripping engagement with a stud after the wrench has served its purpose. In this connection it is an object to provide a wrench employing a wedge-like jaw member and means for confining the jaw member in such a way that the means can be backed off to release the jaw member.

A further object is to provide a wrench of the type indicated which can be quickly adjusted to accommodate and grip a stud bolt or the like.

Another object is to provide a device of the type indicated in which interchangeable jaw sets can be used.

Still another object is to provide an improved type of jaw set construction.

These and other objects will be apparent from the drawing and the following description.

Referring to the drawing:

Fig. 1 is an elevational view of a device embodying the invention shown engaging a stud;

Fig. 2 is a plan view of the device of Fig. 1;

Fig. 3 is a sectional plan view on line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view in the planes of line 4—4 of Fig. 2;

Fig. 5 is a bottom plan view showing the jaws engaging or gripping a stud bolt;

Fig. 6 is a bottom plan view with the jaws in released position; and

Fig. 7 is a sectional view of the jaws in the plane of line 7—7 of Fig. 6.

More particularly describing the invention, 11 generally indicates the body of the wrench and this is provided with a cylindrical main portion 12 and a reduced upper portion 13, the latter being hexagonal to facilitate the application of a tool thereto. The body is formed to provide an opening 15 therethrough which is shown as square in cross section so that a tool may be inserted therein. Below the opening 15 and within the main portion 12 of the body there is provided an elongated cavity generally indicated by 18. This cavity is characterized by arcuate end walls 19 and 20. The wall 20 is concentric about the center of the axis of the opening 15 and extends somewhat more than 180°. The wall 19 is concentric about a central axis which is laterally offset from the axial center of the wall 20. The wall 19 also extends somewhat more than 180°.

At one side the body portion 12 is slotted at 22, the slot interrupting the end wall 19.

Marginal, pin-receiving recesses are provided at each side of the cavity 18 in the region where the two walls 19 and 20 would intersect if not interrupted, the recesses being indicated by numeral 24. The pin-receiving recesses each accommodate a pin 25 and the recesses are

so shaped as to permit of lateral movement of the pin from a retracted position such as the pin shown at the left side of the drawing in Figs. 3 and 5 to an extended position such as that of the pin at the right side of the drawing in those figures. The pins are each provided with a lateral groove indicated by 26 which partially receives an adjustment screw 27 having a tapered end 28, a threaded portion 29, and a handle portion 30. The adjustment screws also have a spring detent member 31 for engagement with a recess 32 in the side of the body portion 12 to assist in properly positioning them and to releasably hold them in adjusted position. One complete clockwise rotation of an adjustment screw serves to move the pin associated therewith from retracted to extended position.

Within the body cavity 18 I provide a pair of jaws or a jaw set, generally indicated by 35. These jaws are pivotally connected by a hinge member 36 and a spring 37 is provided for biasing the jaws to expanded position in which they are shown in Fig. 6. The spring comprises a wire having a central portion 38 received in groove 39 in the jaw member 40. End portions 41 of the spring are curved as shown and the tips thereof anchored in the other jaw member, 42, in any suitable manner. Also, the spring may be secured to jaw 40, if desired.

The jaw 40 has an arcuate outer face 43 which has the same radius of curvature as the wall surface 20. The inner surface 44 of the jaw member is concentric with the outer face and has screw threads formed therein which correspond to the threads of the stud bolt to be gripped. Jaw 42 is slightly wedge-shaped, being somewhat thicker at the free end than at the hinged end. This jaw also has an arcuate outer face, 46, which is substantially of the same radius of curvature as the end faces 19 and 20 of the cavity 18 and has an inner threaded face 47.

A threaded pin 48 is mounted in jaw 42 to facilitate operation of the device, the pin 48 extending through the slot 22.

In the operation of the device, the wrench, with the jaws expanded (Fig. 6) is slipped over a stud bolt or stud S as shown in Fig. 1. Assuming it is a right-hand thread on the stud and it is desired to drive the stud or rotate it clockwise, the pin 25 at the right-hand side of the drawing is adjusted to extended position by means of the appropriate adjustment screw 27. The other screw 27 is backed off to permit the other pin to retract. The jaws are then moved by means of the pin 48 into a position approaching that shown in Figs. 3 and 5, whereupon rotation of the wrench relative to the stud will cause a firm gripping of the stud as the jaw member 42 becomes wedged tightly between the pin 25 (at the right side in the drawing) and the stud. As a result, the stud is firmly engaged and in fact so firmly engaged that it is unnecessary to serrate or roughen the threaded surfaces 44 and 47, although this may be done if desired.

After the operation has been completed and it is desired to remove the wrench from the stud, this is easily accomplished by backing off the adjustment screw about one turn which has been holding the pin 25 extended, thereby releasing the gripping action of the jaws on the stud and permitting a person to quickly return the jaws to the expanded or retracted position of Fig. 6. Thus by using an adjustable pin 25 or its equivalent as a surface against which to wedge the jaw member 42 and by having this pin adjustably retractable, I can readily release the gripping action when desired.

For use in pulling a right-hand threaded stud the jaw set is removed, inverted, turned 180° and replaced. The wedging action is then against the opposite pin member from that in the above description.

It will be apparent that various-sized interchangeable

jaw sets may be used and also that any desired interior surface may be provided on the jaw members for the gripping of various objects.

Although I have illustrated and described a preferred form of my invention, I contemplate that various changes and modifications can be made without departing from the invention, the scope of which is indicated by the following claims.

I claim:

1. A wrench for driving and pulling studs, comprising a body having a cavity, a wedge-like jaw member in said cavity, a movable jaw backing member projecting into said cavity, said jaw member being adapted to be wedged between said jaw backing member and a stud received in said cavity, and adjustable means holding said jaw backing member, said last-mentioned means being operable to permit of said jaw backing member backing off from said jaw member whereby to loosen said jaw member from being tightly wedged between said jaw backing member and the stud.

2. A wrench as set forth in claim 1 in which said jaw backing member comprises a pin and in which said adjustable means comprises a screw engaging said pin.

3. A wrench for driving and pulling studs, comprising a body having a stud-receiving cavity at one end and means engageable with one side portion of a stud, a wedge-like jaw in said body having an inner surface engageable with a side portion of the stud opposite to said one side portion, a jaw backing member engageable by the outer surface of said jaw, said backing member being movable toward and away from said jaw, and adjustable means for holding said backing member in a given position from which it may be released for movement away from said jaw to loosen the same.

4. A wrench for driving and pulling studs, comprising a body having a cavity at one end, said cavity having an arcuate side wall extending through somewhat more than 180°, a pair of jaws in said cavity for receiving a stud, said jaws having cylindrically arcuate outer faces substantially conforming in curvature to said arcuate side wall of said cavity, one of said jaws being tapered in thickness in a direction from end to end, a jaw backing member projecting into said cavity at one end of said side wall, said tapered jaw being adapted to be disposed and wedged between said backing member and a stud between said jaws, said backing member being retractable in a direction outwardly of said cavity, and adjustable means for holding said backing member in a given position.

5. A wrench as set forth in claim 4 in which said backing member comprises a pin, said body being recessed to receive the pin and permit limited lateral movement thereof, and in which said adjustable means comprises a screw threadedly mounted in said body and engaging said pin.

6. A wrench for driving and pulling studs, comprising a body having a cavity at one end, said cavity having an arcuate side wall extending through somewhat more than 180°, said cavity extending laterally of the body beyond the ends of said side wall, an elongated recess in said body at the end of said side wall extending axially of the central axis of curvature of said side wall, a pin in said recess, said pin and recess being so proportioned

and shaped as to permit of the pin projecting laterally into the cavity in said body in an extended position and to permit of said pin being withdrawn out of said cavity in a retracted position, adjustable means for releasably holding said pin in extended position, and a pair of jaws in said cavity for receiving a stud therebetween, one of said jaws being tapered from end to end and being adapted to be wedged between said pin and said stud.

7. A wrench for driving and pulling studs, comprising a body having a cavity at one end, said cavity having an arcuate side wall extending through somewhat more than 180°, said cavity extending laterally of the body beyond the ends of said side wall, an elongated recess in said body at each end of said side wall extending axially of the central axis of curvature of said side wall, a pin in each said recess, each of said pins and recesses being so proportioned and shaped as to permit of the pin projecting laterally into the cavity in said body in an extended position and to permit of said pin being withdrawn out of said cavity in a retracted position, adjustable means for selectively releasably holding said pins in extended position, and a pair of jaws in said cavity for receiving a stud therebetween, one of said jaws being tapered from end to end and being adapted to be wedged between a pin and said stud, said jaws being reversible whereby said tapered jaw is used against said other pin.

8. A wrench as defined in claim 7 in which said jaws are pivotally connected at one end and in which the jaws have cylindrically arcuate outer faces adapted to fit the side wall of the cavity in said body.

9. A wrench for driving and pulling studs, comprising a wrench body having a cavity at one end with an inner end wall and a pair of arcuate side walls, said side walls being cylindrically arcuate about laterally offset axes and each extending through somewhat more than 180°, a recess in the body at each side where the side walls of the cavity would otherwise intersect, said recesses extending axially of the axis of curvature of said side walls, a pin in each recess, said recesses and pins being so proportioned as to permit limited lateral movement of the pins between an extended position wherein they project laterally into said cavity and a retracted position wherein they are wholly within the recesses, means for selectively adjustably holding said pins in extended position, and a pair of jaws in said cavity for receiving a stud therebetween, said jaws having outer surfaces conforming in curvature to the curvature of the end walls of the cavity, one of said jaws being tapered in a direction from end to end, said tapered jaw being adapted to be wedged between one of said pins and the stud.

References Cited in the file of this patent

UNITED STATES PATENTS

792,791	Rich	June 20, 1905
1,121,760	Reip	Dec. 22, 1914
1,279,349	Johnson	Sept. 17, 1918
1,694,628	Sauveur	Dec. 11, 1928
2,580,247	Secondi et al.	Dec. 25, 1951
2,629,277	Valvano	Feb. 24, 1953

FOREIGN PATENTS

101,192	Great Britain	Aug. 24, 1916