

March 18, 1941.

R. E. KELLOGG

2,235,374

FORTABLE POWER-DRIVEN SCREW DRIVER

Filed June 2, 1939

2 Sheets-Sheet 1

Fig. 1.

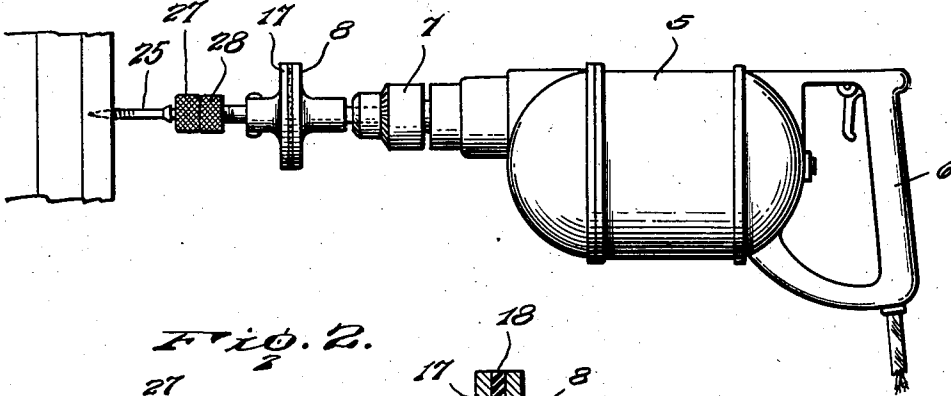


Fig. 2.

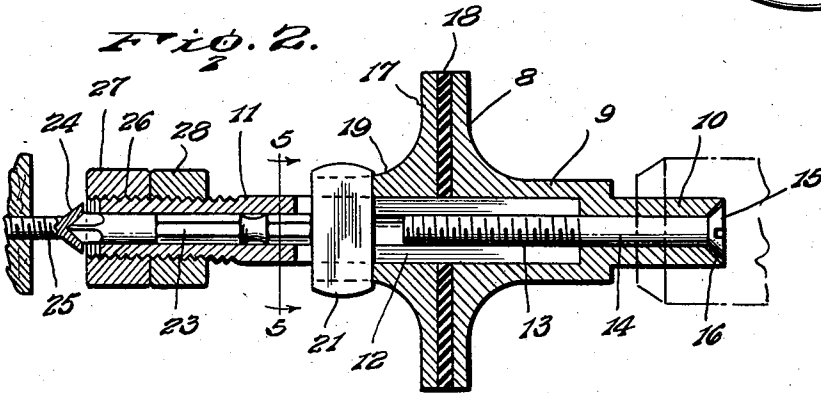
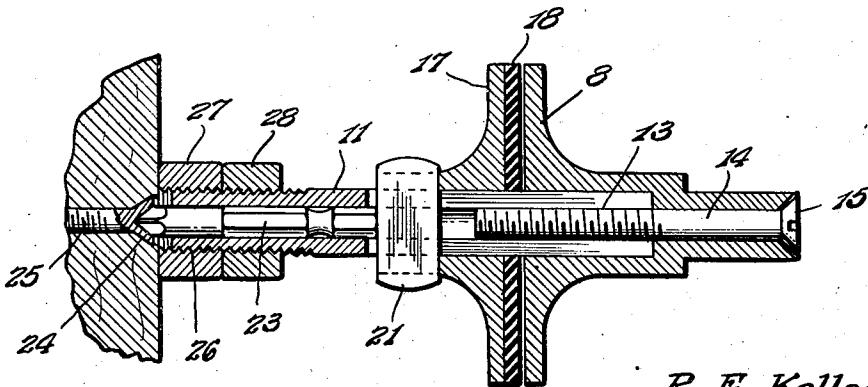


Fig. 3.



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2 Sheets-Sheet 2

Fig. 4.

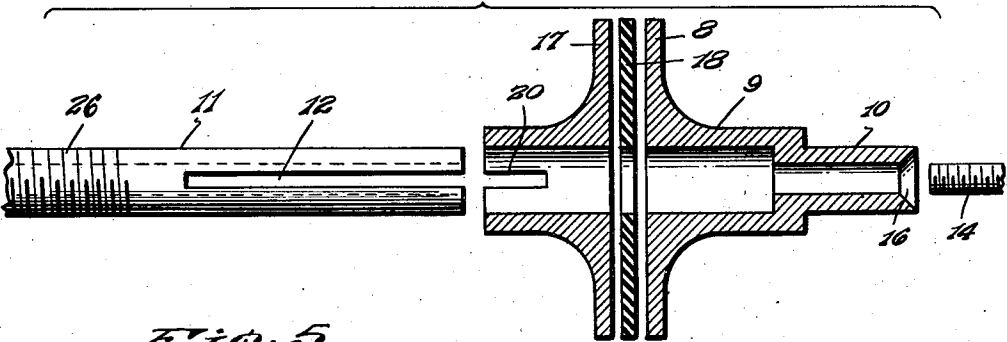


Fig. 5.

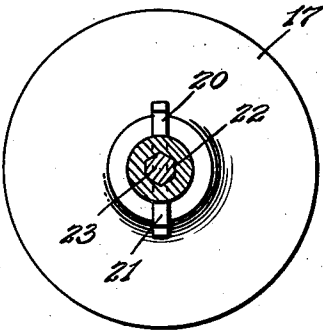


Fig. 7.

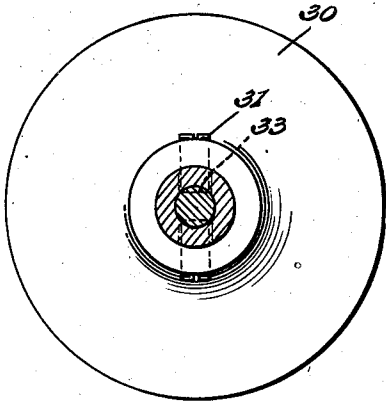
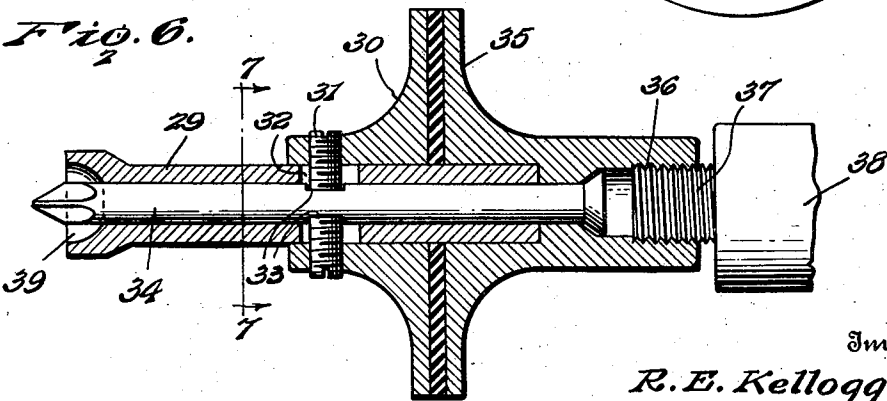


Fig. 6.



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PORTABLE POWER-DRIVEN SCREW DRIVER

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Application June 2, 1939, Serial No. 277,077

9 Claims. (Cl. 144—32)

This invention relates to power-driven tools and more particularly to a power-driven screw driver.

The object of the invention is to provide a power-driven screw driver of simple and inexpensive construction capable of being quickly attached to the chuck of any standard make of power unit and which will effect the driving of a screw into the work with greater facility and more expeditiously than heretofore.

A further object of the invention is to provide a screw driver including a driving element and a driven element, one of which is free to rotate on a tubular bit-receiving member and the other movable therewith, the parts being so arranged that, when pressure is exerted on the bit, motion will be transmitted from the driving element to the driven element to effect driving of a screw into the work.

A further object is to provide means for regulating the depth of penetration of the screw into the work and means for relieving pressure on the bit and automatically disconnecting the driving element from the driven element after said screw has penetrated the work to the desired depth.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency as well as to reduce the cost of manufacture.

In the accompanying drawings forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawings—

Figure 1 is a side elevation of a power-driven screw driver embodying the present invention.

Figure 2 is an enlarged longitudinal sectional view showing a screw partially driven into the work.

Figure 3 is a similar view showing the screw driven home and the adjusting nuts in engagement with the work to relieve pressure on the driving bit.

Figure 4 is a side elevation, partly in section, showing the tubular member and its associated parts separated and in position to be assembled.

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 2.

Figure 6 is a longitudinal sectional view illustrating a modified form of the invention, and

Figure 7 is a transverse sectional view taken on the line 7—7 of Figure 6.

The improved device forming the subject-matter of the present invention may be used in connection with any type of power unit, and by

way of illustration is shown applied to a portable electrically driven power unit, in which 5 designates the casing or body portion, 6 the hand grip and 7 the chuck. The device comprises a driving member or disk 8 having a hollow hub portion 9 terminating in a reduced cylindrical extension 10 adapted to fit within the chuck 7 and to be gripped thereby so that, when current is applied to the power unit, motion will be transmitted from said power unit to the driving element. Fitting loosely within the hub 9 of the driving element is a tubular member or sleeve 11, the walls of which are provided with registering longitudinal slots 12 and internal threads 13 for engagement with a correspondingly threaded screw 14. The head 15 of the screw 14 engages a counter-sunk seat 16 formed in the inner end of the extension 10 so as to permit free rotation of the driving member 8 on said tubular member. Coacting with the driving member 8 is a driven member 17 also preferably in the form of a disk, and interposed between the confronting faces of the driven and driving members is a friction element 18 preferably in the form of a flat disk or washer formed of rubber, leather or other suitable material. The driven member 17 is also provided with a hub portion 19 having transversely aligned notches or seats 20 formed therein, and fitted in said seats is a key 21 which extends transversely through the slots 12 and causes the driven member to turn with the tubular member or sleeve 11. The bore of the tubular member 11 at the free end thereof is preferably angular in cross section, as indicated at 22, and axially slidable in said bore is a correspondingly angular shaped driving bit 23, the free end of which normally projects beyond the adjacent end of the tubular member and is provided with one or more fins or flanges 24 for engagement with correspondingly shaped grooves 25 formed in the head of a screw, indicated at 26. It will thus be seen that the bit 23 is both non-rotatably and slidably mounted in the tubular member or sleeve 11. The rear end of the bit 23 normally bears against the adjacent edge of the key 21 so that, when pressure is applied to the bit 23 in the act of driving a screw into the work, said pressure will be transmitted to the key 21 and thence to the driven member 17, thereby causing said member 17 to frictionally engage the driving element 8 through the medium of the intermediate disk 18 and transmit motion from the driving element to the driven element to rotate the bit and cause the screw to penetrate the work. The exterior walls of

the tubular member 11 at the free end thereof are threaded at 26 for engagement with correspondingly threaded adjusting sleeves or collars 27 and 28. The purpose of the adjusting sleeve or collar 27 is to engage the work after the screw has penetrated said work to the desired depth and thereby relieve pressure on the bit 23 so as to disengage the driving element from the driven element and automatically stop further rotation of said bit. By adjusting the collar 27 longitudinally of the tubular member 11, the depth of penetration of the screw into the work may be varied at will and after the desired adjustment of the collar 27 has been effected, said collar is locked in adjusted position by moving the collar 28 in engagement therewith. As the driving and driven members 8 and 17, respectively, do not interengage until pressure is exerted on the bit 23, the driving member is normally free to revolve on the sleeve 11 without rotating said sleeve and, consequently, the bit 23 may be inserted within or removed from its seat in the tubular member without stopping the power unit.

In operation, the reduced end 10 of the driving member 8 is inserted into the chuck 7 of the power unit, after which the driving bit 23 is fitted to its seat with the active end of the bit engaging the screw to be driven. As pressure is applied to the bit 23, the rear end of the bit by engagement with the key 21 will force the driven member into engagement with the driving member and thus rotate the bit to effect penetration of the screw into the wood. As soon as the screw is driven home, the sleeve or collar 27 will bear against the adjacent surface of the work and thus relieve pressure on the bit which, in turn, disconnects the driving and driven members and automatically stops further rotation of the bit, as will be readily understood.

In Figures 6 and 7 of the drawings, there is illustrated a modified form of the invention, in which the tubular member or sleeve 29 is fastened to the driven element 30 by screws 31 which pass through slots 32 in the sleeve and engage notches or recesses 33 in the bit 34, said bit being axially movable within the sleeve 29, as shown. In this form of the device, the hub of the driving element 35 is internally threaded at 36 for engagement with the correspondingly threaded shank 37 of a power unit, indicated at 38, and the end 39 of the tubular member or sleeve 29 by engagement with the work serves to take the pressure off the bit 34 after a screw has been driven into the work.

It will, of course, be understood that the devices may be made in different sizes and shapes and attached to any type of power unit without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new is:

1. A device of the class described comprising a sleeve, a driving member mounted for rotation on the sleeve, a bit non-rotatably and axially slidable in the sleeve for engagement with a screw, a driven member non-rotatably and axially slidable on said sleeve and operable by the bit, means actuated by pressure on the bit for transmitting motion from the driving member to the driven member, and means carried by the sleeve and adapted to bear against the work for relieving pressure on the bit and rendering the driving member inactive when the screw penetrates the work to a predetermined depth.

2. A device of the class described comprising a sleeve, a driving member mounted for rotation

on the sleeve, a bit non-rotatably and axially slidable in the sleeve for engagement with a screw, a driven member non-rotatably and axially slidable on the sleeve and operable by the bit, means actuated by pressure on the bit for transmitting motion from the driving member to the driven member, a collar adjustably mounted on the sleeve and adapted to bear against the work for relieving pressure on the bit and rendering the driving member inactive when the screw penetrates the work to a predetermined depth, and means for locking the collar in adjusted position.

3. A device of the class described comprising a sleeve, a bit non-rotatably and axially slidable in said sleeve, a driving member loosely mounted for rotation on the sleeve and adapted to engage a power chuck, a driven member non-rotatably and axially slidable on said sleeve and operable by the bit, a friction disk interposed between said members, a key carried by the driven member and extending through the sleeve for engagement with the adjacent end of the bit whereby pressure exerted on the bit will cause the driven and driving members to interengage and transmit rotary motion to the bit.

4. A device of the class described comprising a longitudinally slotted sleeve, a driving member mounted for rotation on one end of the sleeve and having means for engagement with a power chuck, a driven member non-rotatably and axially slidable on the sleeve and having seating notches formed therein, a key extending through the slot in the sleeve and seated in said notches, and a bit non-rotatably and axially slidable in the sleeve and bearing against the key for operating the driven member, said bit by engagement with the key serving to actuate the driving member to impart rotary motion to the bit when pressure is exerted on said bit.

5. A device of the class described comprising a longitudinally slotted sleeve, a driving member loosely mounted for rotation on one end of the sleeve and provided with a reduced extension for engagement with a power chuck, a screw extending through said driving member and engaging the sleeve, a driven member non-rotatably and axially slidable on the sleeve, a friction disk interposed between the driving member and driven member, a bit non-rotatably and axially slidable in the sleeve for operating the driven member, a collar adjustably mounted on the sleeve adjacent the bit, and means for holding the collar in a set position of adjustment.

6. A device of the class described comprising a sleeve having one end thereof exteriorly threaded and its other end formed with a longitudinal slot, a driving member loosely mounted on the sleeve and provided with a reduced extension for engagement with a power chuck, a pin extending through said extension and having threaded engagement with the interior of the sleeve, a driven member non-rotatably and axially slidable on the sleeve, a key carried by the driven member and extending through the longitudinal slot in the sleeve, a bit non-rotatably and axially slidable in the sleeve and bearing against the key for operating the driven member, and a collar adjustably mounted on the threaded portion of the sleeve.

7. A device of the class described comprising a longitudinally slotted sleeve, a driving member loosely mounted for rotation on the sleeve and provided with a reduced extension for engagement with a power chuck, the end of said ex-

5 tension being counter-sunk, a pin having one end thereof provided with an enlarged head seated in said counter-sunk portion and its other end threaded within the sleeve, a driven member non-rotatably and axially slidable on the sleeve, a friction disk interposed between the driving member and the driven member, a key carried by the driven member and extending through the slot in the sleeve, a bit non-rotatably and axially slidable in the sleeve and bearing against the key for operating the driven member, a collar adjustably mounted on the sleeve adjacent the bit, and a second collar contacting with the first-mentioned collar for holding said first-mentioned collar in a set position of adjustment.

10 8. A device of the class described comprising a sleeve having one end thereof formed with a longitudinal slot and its other end exteriorly threaded, the threaded end of the sleeve being formed with a seat having angular walls, a driving member loosely mounted for rotation on the slotted end of the sleeve and provided with means for engagement with a power chuck, a pin extending loosely through the driving member and having threaded connection with the interior of the sleeve, a driven member non-rotatably and axially slidable on the sleeve, a key carried by the driven member and extending transversely

through the slot in the sleeve, a bit non-rotatably and axially slidable in the seat of the sleeve and having angular walls for engagement with the angular walls of said seat, the rear end of the bit normally bearing against the key whereby when pressure is exerted on the bit the driving and driven members will interengage and transmit rotary motion to said bit.

9. A device of the class described comprising a sleeve having registering slots formed therein, a driving member loosely mounted for rotation on the sleeve and having one end thereof provided with a threaded socket for engagement with a correspondingly threaded boss on a power unit, a driving bit non-rotatably and axially slidable in the sleeve and having one end thereof provided with an enlarged head fitting within the driving element and provided intermediate its ends with oppositely disposed notches, a driven element non-rotatably and axially slidable on the sleeve and operated by the bit, a friction disk interposed between the driving element and the driven element, and threaded pins carried by the driven element and extending through the slots in the sleeve with their terminals seated in the notches in the driving bit.

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