Jan. 2, 1951 L. LEWIS 2,536,191

SCREW DRIVER

Filed Jan. 13, 1948

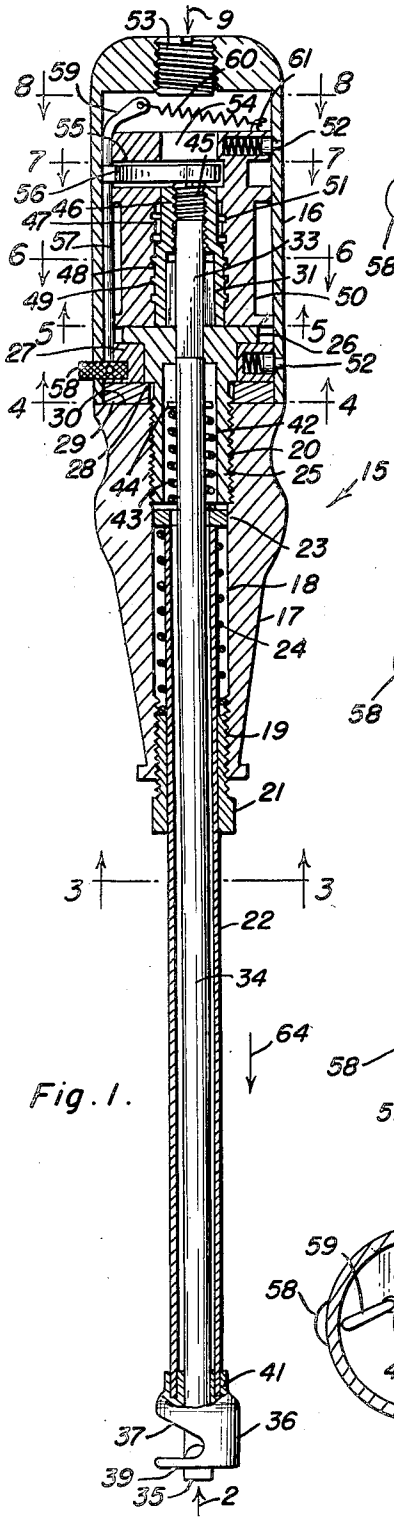


Fig. 1.

Fig. 9.

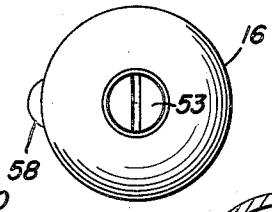
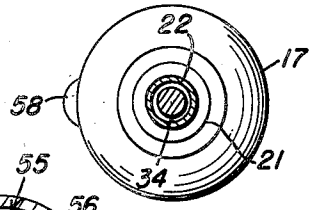


Fig. 3.



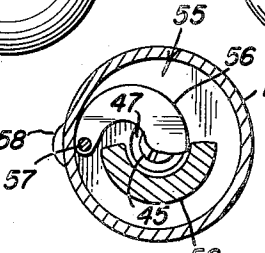


Fig. 7.

Fig. 4.

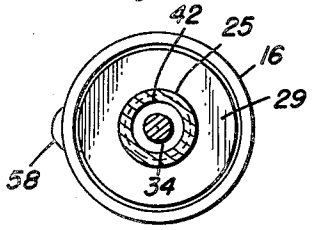


Fig. 5.

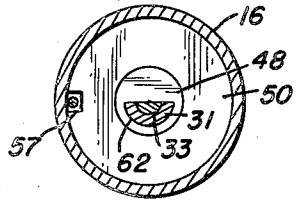


Fig. 6.

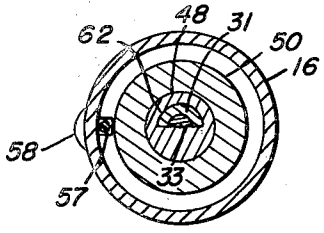


Fig. 2.

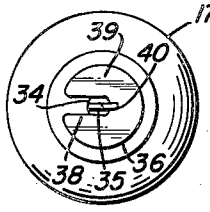
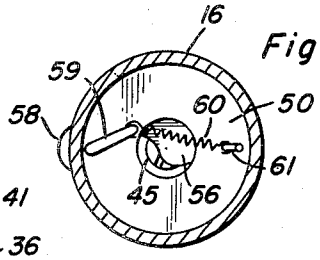


Fig. 8.



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SCREW DRIVER

Lloyd Lewis, Indianola, Ill.

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2 Claims. (Cl. 145—50)

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This invention relates to new and useful improvements and structural refinements in screwdrivers, and the principal object of the invention is to provide a screwdriver of the class described which embodies in its construction means for firmly and securely holding the screw while the screw is being applied to or removed from the work, as well as while the screw is being tightened or loosened.

A further object of the invention is to provide a screwdriver in which the screw may be readily applied and which may be disengaged from the screw with equal expedience.

Another object of the invention is to provide a screwdriver which, by virtue of the characteristics above outlined, will eliminate the marring or scratching of the work, such as most commonly experienced when screwdrivers of conventional types slipped or became disengaged from the head of the screw being turned.

An additional object of the invention is to provide a screwdriver which is simple in construction, convenient in operation, and which will not easily become damaged.

A still further object of the invention is to provide a screwdriver which will readily lend itself to economical manufacture and which is otherwise well adapted for the purpose for which it is intended.

With the above more important objects in view, and such other objects as may become apparent as this specification proceeds, the invention consists essentially of the arrangement and construction of parts as illustrated in the accompanying drawings, in which:

Figure 1 is a longitudinal cross sectional view of the invention;

Figure 2 is an end view, facing in the direction of the arrow 2 in Figure 1;

Figures 3–8 are cross sectional views, taken substantially in the planes of the lines 3—3 to 8—8 respectively, in Figure 1; and

Figure 9 is an end view of the invention, taken in the direction of the arrow 9 in Figure 1.

Like characters of reference are employed to designate like parts in the specification and throughout the several views.

Referring now to the accompanying drawings in detail, the invention consists of a screwdriver designated generally by the reference character 15, the same embodying in its construction a rotatable handle 16 which constitutes a continuation of a relatively stationary head or body 17, these two members being axially aligned and the

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head or body 17 being provided with an axial bore 18, screw-threaded as at 19 and 20.

A screw-threaded adjusting bushing 21 is positioned in the portion 19 of the bore 18, the bushing 21 providing a sliding bearing for a projectible and retractible tubular casing 22. The inner end of this casing is equipped with an enlarged shoulder 23 which slidably engages the bore 18, and a compression spring 24 is interposed between the bushing 21 and the shoulder 23, as will be clearly apparent. By virtue of this arrangement, the casing 22 is normally urged to retracted position, so to speak, that is, in the direction of the arrow 2 in Figure 1.

The portion 20 of the bore 18 accommodates a screw-threaded sleeve 25 of an adapter 26 disposed in the handle 16. A rotatable annulus 27 is provided on the adapter 26, but a shoulder 28 of the adapter bears against a washer 29 which, in turn, engages the end surface 30 of the head 17. Accordingly, the adapter 26 together with the washer 29 are secured to the head 17 by the sleeve 25, but it should be understood that sufficient clearance is provided to facilitate free rotation or movement of the annulus 27 on the adapter 26, as already mentioned.

The adapter 26 also includes a semi-tubular portion 31 in which is slidably accommodated a semi-cylindrical end portion 33 of a rod 34. The remaining end portion of this rod is flattened to provide the usual blade 35 for engaging the kerf of the screw to be turned.

It may be explained at this point that a screw receiving socket 36 is provided on the casing 22 adjacent to the blade 35, this socket being configurated substantially as shown and being laterally relieved as at 37 so that the head of a screw may be placed in the socket while the shank of the screw projects outwardly through an open-ended slot 38 formed in the closed end wall 39 of the socket. The rod 34 is of a constant diameter throughout its length, and it will be noted that the inner end of the slot 38 is notched as at 40, so that the blade 35 may be projected outwardly from the socket, as shown in Figure 1.

Needless to say, the socket 36 is rigidly secured to the casing 22 in any suitable manner, such for example, as indicated at 41, and it should also be noted that the socket provides a sliding bearing for the rod 34, as will be clearly understood.

The aforementioned sleeve 25 of the adapter 26 includes an axial bore 42 to accommodate a compression spring 43, one end of which engages the aforementioned shoulder 23 of the casing 22, while the remaining end of the spring 43 bears

against a transversely extending pin 44 provided in the rod 34.

Accordingly, the spring 43 urges the inner end of the rod 34, more specifically, the end of the rod portion 33 in engagement with an adjusting screw 45 which, in turn, engages a screw-threaded bore 46 in an extension 47 of a driven member 48. This member is formed on the outer lateral surface thereof with a screw thread 49 which engages a complementary internal screw thread provided in a coacting driving member 50. The internal screw thread of the driving member 50 is illustrated at 51.

The driving member 50 is freely rotatable upon the adapter 26 and is provided with a plurality of spring-pressed plungers or pins 52 which are engageable with suitable apertures formed in the lateral wall of the handle 16. The latter may, if desired, be equipped with an oil lug 53, upon removal of which lubricants may be administered to the internal working mechanism.

An opening 54 constitutes a continuation of the screw-threaded bore 51 of the member 50, and it will be noted that the member 50 is also provided with a transverse recess 55 in which is disposed a movable stop dog 56. As is best shown in Figure 7, this dog is of an arcuate configuration, one end portion thereof being rigidly secured to a control shaft 57 which, in turn, is rotatably journalled in the member 50 and in the aforementioned annulus 27. One end portion of the shaft 57 carries a toothed control knob 58 which projects outwardly through a suitable opening formed in the handle 16, while the remaining end portion of the shaft 57 is angulated to provide a crank 59. A tension spring 60 is anchored at one end thereof to the member 50 and at 61, the remaining end of the spring being anchored to the free extremity of the shaft portion 59 whereby the dog 56 is normally urged into such a position that the free end portion thereof is disposed above the aforementioned adjusting screw 45.

In addition to being provided with the bore 46, the driven member 48 is formed with a semi-cylindrical bore 62 to slidably accommodate the portion 31 of the adapter 26. By virtue of this the adapter 26, the member 48 and the rod 34 are slidably but non-rotatably connected together.

It will be apparent from the foregoing that by turning the knob 58 in the direction of the arrow 63 the dog 56 will be moved so that it uncovers the screw 45 and the associated extension 47 of the driven member 48.

Thereupon, by holding the head 17 stationary and rotating the handle 16, the member 48 together with the extension 47 and the screw 45 will be caused to travel upwardly, that is, in the direction of the arrow 2 in Figure 1, so that the extension 47 enters the aperture or opening 54. This movement of the driven member 48 (and extension 47) is, of course, facilitated by the engagement of the screw threads 49, 51, it being understood that as the driving member 50 rotates, the driven member 48 is non-rotatable, but is free to slide either upwardly or downwardly, depending upon the direction of rotation of the driving member.

The adapter 26, of course, remains stationary with respect to the head 17, and the driving member 50 is rotated by the engagement of the pins 52 with the handle 16 when the handle is turned.

By virtue of the complementary semi-circular cross sectional configuration of the rod portion 33, the adapter sleeve 31 and the bore 62, the rod 34 is non-rotatable while sliding motion is imparted to the driven member 48, but the compression spring 43 will urge the end of the rod portion 33 in engagement with the screw 45, so that as the handle 16 is turned, the blade 35 will recede or retract itself into the sleeve 22.

Thereupon, a screw may be applied to the socket 36 as has been already described, after which the handle 16 may be rotated (while the head 17 is still being held stationary) in a relatively opposite direction, so that the blade 35 is engaged with the kerf of the screw. As the rotation of the handle 16 in opposite direction is continued, the screw in the socket 36 will obviously prevent the blade 35 from being projected outwardly from the socket, and as a result, the entire casing 22 will be projected or forced outwardly from the head 17 against the resiliency of the spring 24, in the direction of the arrow 64. Ultimately, a point will be reached when the rod 34 and the casing 22 have been projected to such an extent that the resiliency of the spring 60 will cause the dog 56 to return to its normal position (shown in Figure 7), whereby retraction of the rod 34 and the casing 22 will be prevented.

Thereupon, by turning the handle 16, the entire screwdriver will be "locked" so to speak, it will be possible to turn the entire screwdriver either clockwisely or anti-clockwisely, so as to tighten or loosen the screw.

The separation of the socket 36 from the screw is facilitated by simply repeating the operation or procedure of withdrawing the blade 35 into the socket, as has been already described.

The adjusting bushing 21 is employed for varying the compression of the spring 24, so that the screwdriver may accommodate screw heads of various thicknesses. On the other hand, the adjusting screw 45 may be used for varying the extent of projection or retraction of the blade 35, as will be clearly apparent.

It is believed that the advantages and use of the invention will be clearly understood from the foregoing disclosure and accordingly, further description thereof at this point is deemed unnecessary.

While in the foregoing there has been shown and described the preferred embodiment of this invention it is to be understood that minor changes in the details of construction, combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as claimed.

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

1. In a screwdriver, the combination of a head provided with a bore, a tubular casing having one end portion thereof slidably mounted in said bore and provided at its outer end with a screw receiving socket, resilient means in said bore for urging said casing to an inwardly slid position therein, a hollow handle rotatable on said head, a blade slidable in said casing and extending into said handle, screw-threaded means provided in the handle and responsive to the rotation of the latter for sliding said blade in said casing into engagement with a screw in said socket and thereafter sliding the blade and the casing in unison in said bore, said last-mentioned means including a screw-threaded driving member rotatable with said casing and provided with a lateral recess, and a screw-threaded driven member positioned on said blade and operatively engaging said driving member, and means for locking said casing

and blade against inward sliding movement from a projected position, said locking means including a stop dog pivoted in the recess of said driving member and swingable inwardly to afford a stop for said driven member, and means exteriorly of said handle for swinging said dog.

2. The device as defined in claim 1 wherein said driven member is non-rotatable but slidable on said blade, together with an adjustable screw provided in said driven member, and resilient means for sliding said blade inwardly in abutment with said screw.

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REFERENCES CITED

The following references are of record in the file of this patent:

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