Jan. 7, 1941. W. G. RUNGE 2,227,466

SCREW DRIVER

Filed March 7, 1938

Fig. 1.

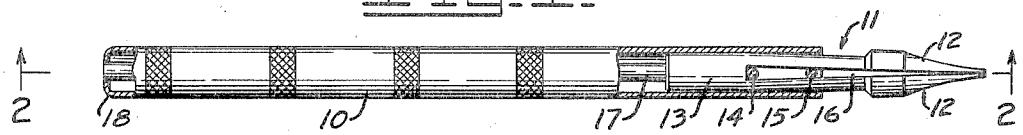


Fig. 2.

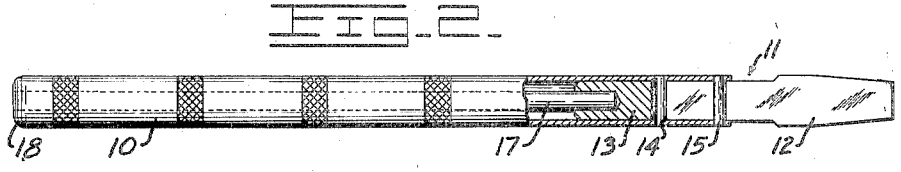


Fig. 4.

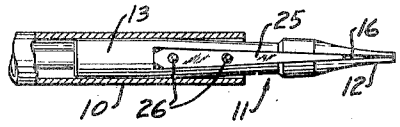


Fig. 3.

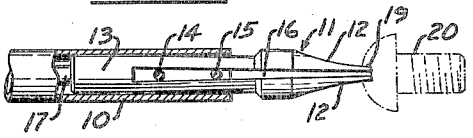


Fig. 5.

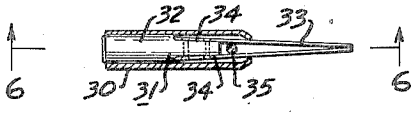


Fig. 6.

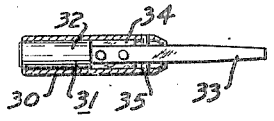
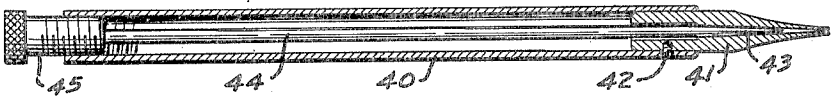


Fig. 7.



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UNITED STATES PATENT OFFICE

2,227,466

SCREW DRIVER

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Application March 7, 1938, Serial No. 194,243

1 Claim. (Cl. 145—50)

This invention relates to screw drivers, and is concerned more particularly with the provision of an improved screw driver which is adapted to retain a screw on the screw-driver bit.

It is a general object of the invention to provide an improved screw driver of the screw retaining type.

Another object of the invention is to provide an improved screw driver which will hold a screw during either insertion or removal of a screw.

Another object of the invention is to provide an improved screw driver of the character referred to which can be adjusted to screw retaining position by a simple pushing engagement of the screw-driver bit with the screwhead.

Other objects will appear from the following description of certain preferred embodiments thereof taken in connection with the accompanying drawing, in which

Fig. 1 is an elevational view of a screw driver embodying my invention, with the handle partially shown in section.

Fig. 2 is a second elevational view of the screw driver, with the bit shown in section as indicated by the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary view of the screw driver with the bit adjusted to screw retaining position.

Fig. 4 is a fragmentary elevational view, partly in section, of a second form of screw driver embodying my invention.

Fig. 5 is an elevational view, partly in section, of a third form of a screw driver embodying my invention.

Fig. 6 is a second view of the screw driver shown in Fig. 5, the sectional portion of the view being taken in the plane of the line 6—6 in Fig. 5.

Fig. 7 is a sectional view of a fourth screw driver embodying my invention.

The screw driver of my invention comprises generally a handle and a bit connected for relative endwise movement, the bit being constructed to expand within the screw slot to grip and hold a screw on the bit in response to pushing engagement thereof with the screwhead.

Referring to Figs. 1–3, the screw driver may comprise a handle 10 which is preferably formed of tubing, and with respect to which a screw-driver bit or head 11 is slidably engaged for relative endwise movement. Head 11 comprises opposite similar resilient bit sections 12 formed integrally at the outer end of a body or bar portion 13 which is slidably engaged within tube 10 and has its movement relative thereto controlled by a pair of pins 14 and 15 having their ends secured in tube 10 and extending through tapered slot 16 provided between bit sections 12. Pins 14 and 15 serve to keep the parts in assembled condition as well as providing the drive connection between the tube and the screw-driver bit. Control rod 17 of the head is pressfitted in body 13 at one end and has its other end slidably supported in formed end 18 of the tube.

Preferably, head 11 is formed from bar stock by turning to the desired shape and size to provide the desired tapered surfaces at the end in which bit sections 12 are formed, after which slot 16 is cut to provide the flat inner surfaces of the bit sections, and the tapered side surfaces may be machined to provide the desired thickness at the ends of bit sections 12. Preferably, the taper of the outer surfaces of the bit sections 12 terminate substantially parallel to the inner surfaces thereof defining slot 16 as seen in Fig. 1. Subsequently, bit sections 12 are bent or formed inwardly to the relatively positions shown in Fig. 1 with the outer ends thereof engaged, and providing the desired taper for the walls of slot 16. After hardening, the head 11 is then ready for assembly in the screw driver. If desired, the outer tapered flat surfaces of bit sections 12 may be formed by grinding after the hardening operation.

In use, bit sections 12 are engaged with the slot of a screw and the screw and screw driver are pushed towards each other, whereby screw-driver head 11 telescopes within tube 10, and pin 15 cooperating with the converging inner cam surfaces of bit sections 12 urges the sections apart so that the ends thereof resiliently engage the walls of the screw slot. In Fig. 3, bit sections 12 have been moved to the left relative to tube 10 from the positions shown in Fig. 1, and pin 15 has urged bit sections 12 apart so that the ends thereof engage the walls of slot 19 of screw 20 to hold it firmly on the screw driver.

The embodiment shown in Fig. 4 is similar to that of Figs. 1–3, and includes handle or tube 10, head 11 having resilient bit sections 12 forming slot 16 therebetween in the same manner as in Figs. 1 and 2. Wedge or cam segment 25 is disposed within slot 16 and is secured in tube 10 by pins 26 with the taper thereof cooperatively related to the converging wall surfaces of slot 16. Thus, wedge 25 also serves to cam bit sections 12 outwardly upon pushing engagement of a screw with the screw driver. This construction is preferred for larger size screw drivers.

Figs. 5 and 6 disclose a construction particularly useful for small size screw drivers. This

screw driver comprises a handle or tube 30 and a bit 31 including a body or rod 32 having spring bit sections 33 pinned to opposite tapered surfaces 34 thereof so that the ends of the bit sections meet. Pin 35 is secured in tube 30 and extends between spring bit sections 33 to hold the parts in assembled position and to cam the sections apart upon pushing engagement of a screw with the bit sections 33.

It will be observed that the pin means, shown in Figures 1 through 6 inclusive, are mounted within the tube transversely thereof at a location spaced from the adjacent end of the tube so as to extend through the slot between the resilient bit sections. The pin means are so cooperatively related to the bit sections as to engage the latter only along portions of the sections spaced at a substantial distance from their screw engaging tip end portions. Thus, only the tip end portions of the resilient bit sections are engageable within the slot of a screw.

The screw driver shown in Fig. 7 is similar in function to the above described screw driver in retaining a screw by expansion of opposed bit sections with a screw slot. The screwdriver comprises tube or handle 40 having slotted bit 41 secured therein as by a screw 42. Bit 41 is slotted transversely to provide opposed bit sections and is apertured to receive pointed cam end 43 of adjusting rod 44 which extends through tube 40 and has head 45 adjustably threaded in the tube. Thus, by turning head 45, cam end 43 can be forced between the bit sections to expand such sections into gripping engagement with the screw slot.

While I have shown and described certain preferred embodiments of the invention, it is to be understood that further modifications and variations can be made without departing from the scope of the invention as defined in the claim appended hereto.

I, therefore, claim as my invention:

In a screw driver, a handle comprising a tube; a screw-driver head telescopically engaged with said tube for free sliding movement therein, said head comprising opposed resilient bit sections connected at one pair of adjacent ends within said tube and having their opposite projecting screw-engaging ends normally engaged to provide an elongated slot between said sections converging toward said screw-engaging ends, said screw-engaging ends having their projecting portions unsupported exteriorly of said tube and forming the sole means for engagement within the slot of a screw; means for spreading said bit sections, for constraining the head and handle to rotate together, and for limiting relative longitudinal movement of the handle and head to prevent entrance of any part between the screw-engaging tip end portions of said bit sections whereby only said screw-engaging tip end portions can enter the screw slot and engage the side walls of said slot resiliently, said means including pin means mounted in said tube transversely thereof at a location spaced from the adjacent end of said tube and extending through said slot, said pin means being cooperatively related to said sections to engage said sections only along portions of the sections spaced a substantial distance from their screw-engaging tip end portions and to effect spreading of said screw-engaging ends upon pushing engagement of a screw therewith and to provide the drive-transmitting connection between said handle and said bit sections; and an extension of said head extending through said tube and through the other end thereof for restoring said bit sections to screw-engaging position by pushing said extension relative to said tube.

WALTER G. RUNGE.