W. J. BAUER.

SPIRAL TOOL DRIVER.

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1,290,489.

Patented Jan. 7, 1919.

Fig. 1.

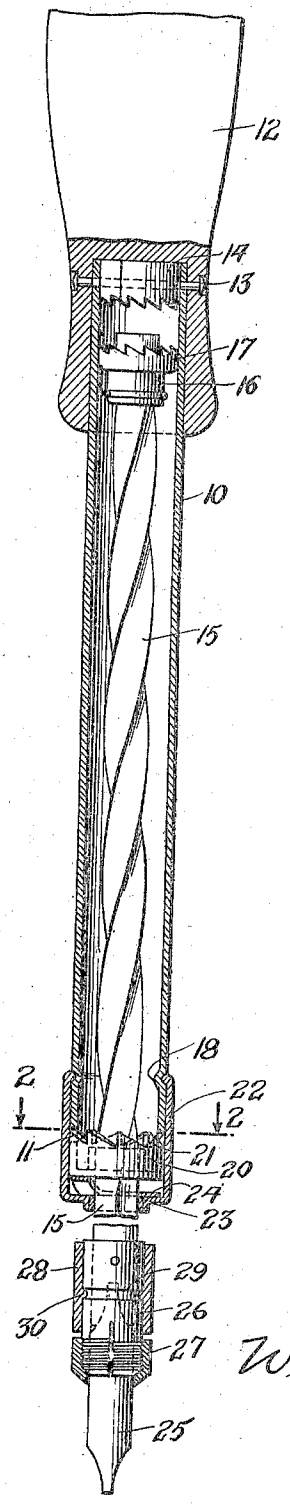
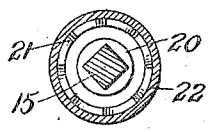


Fig. 2.



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SPIRAL TOOL-DRIVER.

1,290,489. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed September 8, 1917, Serial No. 190,285. Renewed November 19, 1918. Serial No. 263,233.

To all whom it may concern:

Be it known that I, WILLIAM J. BAUER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Spiral Tool-Drivers, of which the following is a specification.

The invention relates to improvements in spiral tool drivers, such as screw drivers or like articles, wherein the tool member or a holder therefor is automatically rotated by pushing down on the handle portion of the screw driver or like article. It has for its object to provide for an inexpensive and satisfactory article of this type, and also to so arranged the parts that the screw driver may be used in the usual manner for service in withdrawing screws, the tool member then operating in reverse direction, as is well understood.

In the accompanying drawings, which illustrate the invention—

Figure 1 is a vertical section of the improved screw driver.

Fig. 2 is a horizontal section taken on the line 2—2, Fig. 1, and looking in the direction of the arrows.

Similar characters of reference designate corresponding parts throughout the several views.

Referring to the drawings, 10 designates a tubular member terminating at its lower edge in a series of circularly arranged ratchet teeth 11. The other end of the tubular member is securely held to the handle portion 12 as through a pin 13 or similar securing means. This pin passes, also, through a member or ring 14 inserted within said end of the tube and provided with a series of inwardly-directed ratchet teeth arranged circularly along its inner edge and corresponding in number to the teeth 11 of said tubular member. Within tube 10 is mounted for reciprocation and rotation a tool rod or member 15, the inner portion of which is spirally formed as by twisting a square rod, the lower and outer portion, however, remaining straight. This tool member 15 carries at its inner end a ring-shaped member 16 having an upper toothed or ratchet portion 17 whose teeth correspond to and are adapted to engage with the similar but oppositely directed teeth of ring 14, for the purpose hereinafter set forth.

The portion 17 of member 16 is enlarged and substantially in contact with the interior wall of tubular member 10 and is adapted to contact at the lower limit of its travel with a circular indentation 18 of the said tubular member, which indentation thus forms a stop to limit the outward movement of said rod 15. About said rod 15 and beyond the teeth 11 of tubular member 10 is mounted a cylindrical or cup-shaped member 20 having inwardly projecting ratchet teeth 21 corresponding to the teeth 11 and adapted to engage therewith. Member 20 is provided with an inwardly-turned flange which is squared to receive the rod 15; and, when not engaged by the teeth 11, is free to rotate with said rod. In order to retain member 20 in position on the rod, a ferrule or cylindrical shell 22 is placed over same on said rod and its inner end held thereon by being turned in to fit the indentation 18 of the tubular member 10. The lower portion, moreover, is turned in to provide a flange and a rod guide 23. Between the flange 23 and the bottom of member 20 is located a suitable spring member 24 which normally forces said member 20 into engagement with the lower end of tubular member 10, the two sets of teeth interlocking.

The said tool member 15 may itself constitute the tool, or any suitable means may be provided on the tool member 15 to receive a suitable tool 25. For example, a chuck 26 may be secured to end of rod 15, said chuck being split longitudinally and adapted to receive over same a nut 27. Furthermore, a cylindrical portion or sleeve 28 may be provided over the connection between chuck and outer end of rod 15, as by providing a circular groove 29 therein, and into which fit projections 30 from the said sleeve. It is to be noted, also, that the inner end of chuck 26 is so constructed as to receive the pointed end of the tool proper, that is to say, the latter may be made double-ended and be conveniently reversed if this becomes desirable.

To operate the tool, it is necessary to first pull out the rod 15 until the shoulder 17 is stopped by the indentation 18. In doing this, cylindrical member 20 will rotate freely as the rod is pulled therethrough, the teeth 21 being disengaged from teeth 11 as the resistance of spring 24 will be overcome by the pulling action. However, upon pushing down upon the screw driver, teeth 21 and 11

will come into engagement; and as the tubular member moves relatively to rod 15, the member 20 being thus locked to the said tubular member, the rod 15 is rotated through the action of the spiral portion of the rod in passing through the squared central portion of member 20 until the limit of travel is reached. Thereupon, the rod 15 must again be pulled out and the cycle repeated.

Should it be desired to operate the screw driver in the reverse direction for service in withdrawing a screw, the tool is used in the position in which the tubular member has been pushed down substantially to its limit of travel, whereupon a slight, further downward movement will cause the teeth of member 16 to engage with teeth of ring 14, and thus lock the handle portion 12 to the tool rod and form, for the time being, an integral portion thereof. The teeth of member 16 being similar in character and number to the teeth of ring 14, there will be no jamming action or difficulty from improper engagement, especially in view of the fact that as the straight portions of the rod slide through the member 20, no rotation of the said rod takes place.

I claim:

1. In a spiral tool driver, the combination of a tubular member terminating at its lower end in ratchet teeth and circularly indented near its lower end, a handle attached to the opposite end of the said member, a nut having ratchet teeth engageable by the teeth of the tubular member, a spiral tool spindle engaged by the nut, reciprocating in the nut and handle, and having a collar at its upper end engageable with the projection formed by the said circular indentation to limit the downward travel of the tool spindle, and a ferrule mounted on the lower end of the tubular member to retain the ratchet nut and spun into the circular indentation of the tubular member.

2. In a spiral tool driver, the combination of a tubular member terminating at its lower end in ratchet teeth and circularly indented near its lower end, a handle attached to the opposite end of the said member, a nut having ratchet teeth engageable by the teeth of the tubular member, a spiral tool spindle engaged by the nut, reciprocating in the nut and handle, and having a collar at its upper end engageable with the projection formed by the said circular indentation to limit the downward travel of the tool spindle, a ferrule mounted on the lower end of the tubular member to retain the ratchet nut and spun into the circular indentation of the tubular member, and resilient means between said ferrule and the said nut, operating to force the latter in the direction of the lower end of said tubular member for engagement with the teeth thereof.

3. In a spiral tool driver, the combination of a tubular member terminating at its lower end in ratchet teeth and circularly indented near its lower end, a handle attached to the opposite end of the said member, a nut having ratchet teeth engageable by the teeth of the tubular member, a spiral tool spindle engaged by the nut, reciprocating in the nut and handle, and having a tubular collar at its upper end engageable with the projection formed by the said circular indentation to limit the downward travel of the tool spindle, said collar terminating at its upper end in ratchet teeth, a ferrule mounted on the lower end of the tubular member to retain the ratchet nut and spun into the circular indentation of the tubular member, and a tubular piece secured within said tubular member at the inner end thereof and terminating at its lower end in ratchet teeth oppositely directed with respect to the ratchet teeth of said collar for engagement therewith.

Signed at New York in the county of New York and State of New York this 27th day of August, A. D. 1917.

WILLIAM J. BAUER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."