

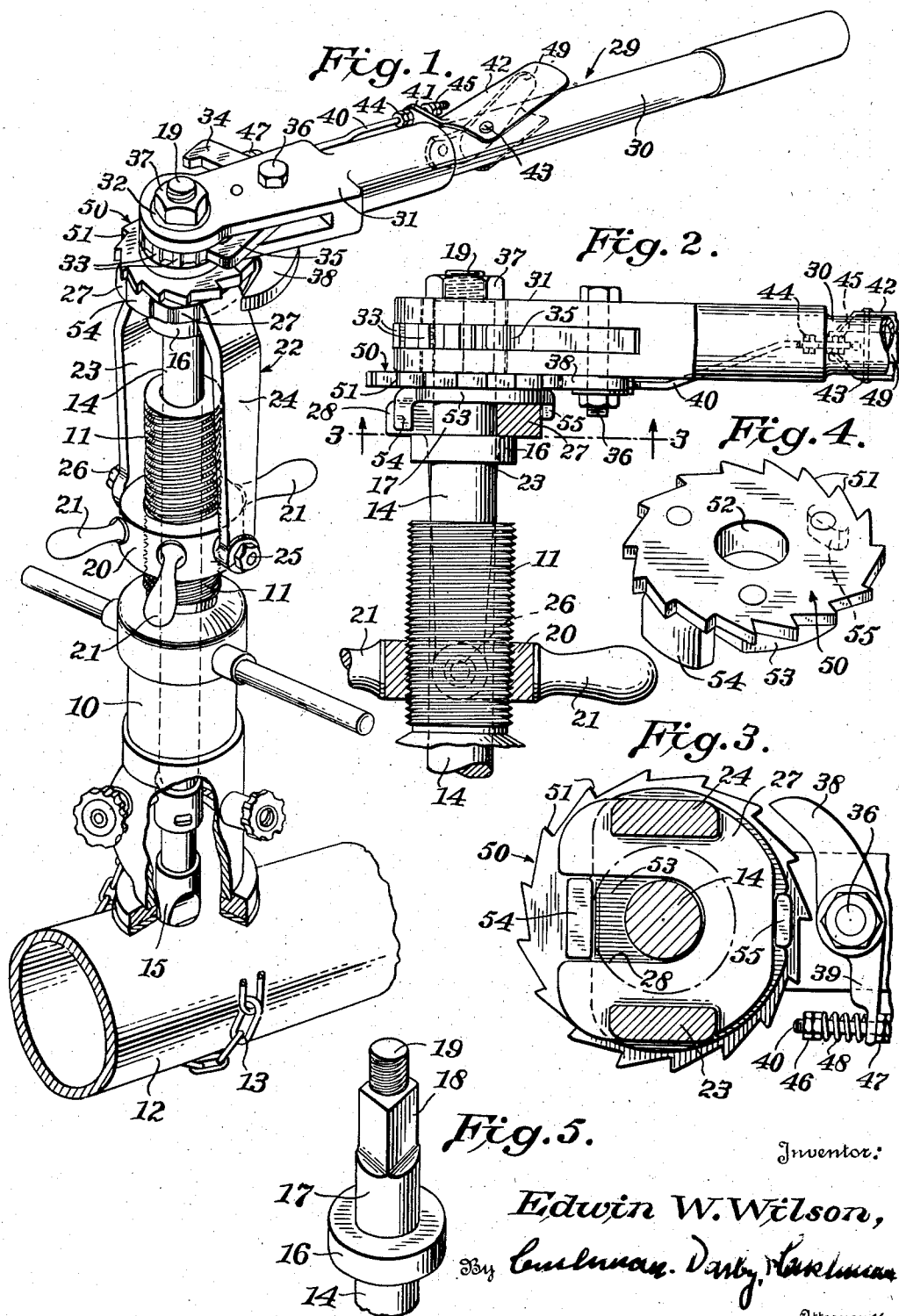
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PIPE TAPPING MACHINE, OR THE LIKE, AND TOOL

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PIPE TAPPING MACHINE, OR THE LIKE,
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This invention relates to machines, such as tapping machines, which include a shaft or bar which is to be rotated and advanced, and to a tool for association with such a machine to drive the shaft or bar. In conventional pipe tapping machines, for example, designed to cut and tap a hole in the side of a pipe, a boring bar is provided which must be rotated and advanced. To this end a ratchet wrench is applied to the boring bar for turning the same and a separate hand wheel has a thrust connection with the bar. A machine of this general type is disclosed in United States Patent No. 1,280,813, issued October 8, 1918, to Philip Mueller and Anton C. Schuermann. It is a principal object of the present invention to simplify manipulation of such a machine by providing means operated by the wrench, at will, to advance the boring bar.

A practical embodiment of the invention is shown by way of example in the accompanying drawing to which reference will now be made.

In the drawing:

Figure 1 is a perspective of a boring machine equipped with the tool of the present invention, the machine being shown in operative relation to a pipe section.

Figure 2 is an elevation on a somewhat larger scale, partly in vertical section, of a portion of the apparatus appearing in Figure 1.

Figure 3 is a section substantially on line 3-3 of Figure 2.

Figure 4 is a perspective of a detail of the tool, and

Figure 5 is a perspective of the upper portion of a boring bar which bar appears also in Figures 1 to 3.

Referring to the drawing, and first to Figure 1, reference numeral 10 designates generally the housing or casing of a tapping machine, this housing terminating upwardly in an externally threaded neck 11. The housing is shown as being mounted in radial relation on a pipe section 12 by a chain 13, the mounting being such that the housing is securely held in position and against rotation about its own axis.

A boring bar 14 carries at its lower end a suitable tool 15 and extends upwardly through and beyond neck 11, being rotatable and suitably packed therein. The boring bar is provided adjacent its upper end with a fixed circumferential abutment 16 and includes a cylindrical portion 17 above the abutment surmounted by a squared portion 18 which in turn is surmounted by a threaded reduced portion 19, Figure 5.

Threaded on neck 11 is a feed nut 20 which is provided with radially extending handles 21 which may be gripped for the purpose of turning the nut and thereby traversing it along the neck.

A yoke generally designated at 22 comprises a pair of arms 23 and 24 which at their lower ends are pivoted at diametrically opposite points 25 and 26 to the nut 20. The pivot 26 appears in Figure 2. Arms 23 and 24 are joined by a cross member or saddle 27, Figures 1, 2 and 3 which is provided with a notch 28 faced in the direction of swinging of the yoke. Notch 28 has parallel side walls spaced apart a distance slightly greater than the diameter of portion 17 of the boring bar and is adapted to be swung into straddling relation to the portion 17 and in overlying engagement with abutment 16 so that upon threading nut 20 downwardly on neck 11, downward thrust is exerted on the boring bar. When the thrust engagement of cross portion 27 with abutment 16 is released, yoke 22 may be swung away from the boring bar so that the latter may be elevated. The structure thus far described constitutes, of itself, no part of the present invention.

A tool generally designated by reference character 29 comprises a handle 30 and a bifurcated head 31 which rotatably carries a ratchet core 32 provided with teeth 33 engageable alternatively by pawls 34 and 35 pivoted in the bifurcated head on a bolt 36, the pawl 35 being shown in engagement with a tooth 33 in Figure 1. The core has a squared opening which receives portion 18 of the boring bar and is held in position by means of a nut 37 threaded on portion 19. The wrench thus far described, and its manner of application to the boring bar, are conventional.

According to the present invention there is pivoted on the underside of head 31 on the same bolt 36 about which pawls 34 and 35 are pivotal, a further pawl 38. Pawl 38 has a tail portion 39 pierced to receive loosely a rod 40 whose other end is loosely received in an opening in an arm 41 of a bell-crank lever 42 pivoted to handle 30 on a pin 43 parallel to bolt 37. Rod 40 is provided with abutment nuts 44 and 45 on opposite sides of arm 41 and with abutment nuts 46 and 47 on opposite sides of tail 39, a compression spring 48 being interposed between the latter and abutment 46. Lever 42 is urged away from handle 30 by means of a leaf spring 49 secured to the latter.

Cooperable with pawl 38 is a ratchet disc 50 provided with teeth 51 and a central opening 52

of a size to receive the upper part of portion 17 of the boring bar. Disc 50 includes a plate 53 riveted to its underside and provided with downwardly projecting lugs 54 and 55.

With cross portion 27 of yoke 22 operatively engaged over abutment 16, disc 50 rests on the cross portion 27 and beneath head 31 with its lug 54 engaged in slot 28 and its lug 55 engaged behind the cross portion so as to maintain the operative relation of the latter on abutment 16. The teeth 51 of disc 50 are in the plane of pawl 38, but the latter is normally held out of engagement with the teeth by the spring 49.

In the tapping operation the operative swing of handle 30 is in a clockwise direction and when it is desired to advance the boring bar, it is only necessary for the operator to slide his hand over lever 42 so that the latter is pulled toward the handle, thereby swinging pawl 38 into yielding engagement with a tooth 51. The consequent rotation of disc 50 is transmitted to cross portion 27 of yoke 22 by lug 54, the yoke in turn transmitting rotation to the feed nut 20.

It is often necessary to turn the boring bar without feeding and it is for this reason that the independent driving pawl 38 is provided. When feed is desired the pawl is very quickly and conveniently engaged with a tooth 51, since the force for swinging lever 42 is exerted in the same direction as that in swinging the wrench handle 30. When the lever 42 is fully swung, its free end lies against handle 30 so that continued force applied to the lever goes to the handle. The lever is pivoted near the inner end of the handle and is sufficiently short to be out of the way of the operator's hands when the wrench is swung solely for the purpose of turning the boring bar.

It will be seen that the present invention, in the disclosed embodiment, is extremely advantageous and simplified by reason of the fact that it takes advantage of existing structures, adding a minimum number of parts for the attainment of the new results. However, the invention is not limited to the specific embodiment herein described, but is susceptible of variation in form and arrangement of parts without departure from the scope of the following claims.

I claim:

1. For use with a machine of the class described, said machine comprising a housing, a shaft, said housing including an externally threaded neck, said shaft extending through and outwardly of said neck and being rotatable therein, an abutment on said shaft outwardly of said neck and spaced from the outer end of said shaft, a nut threaded on said neck, and a yoke secured to said nut and including a cross portion in overlying engagement with said abutment; a ratchet disc rotatable on said shaft beyond said abutment and in rotary driving engagement with said cross portion, a ratchet wrench engageable with said shaft beyond said disc and operable to rotate said shaft, and a pawl on said wrench cooperable with said disc whereby to turn the latter and therewith said yoke and nut for the purpose of advancing said shaft.

2. For use with a machine of the class described, said machine comprising a housing, a shaft, said housing including an externally threaded neck, said shaft extending through and outwardly of said neck and being rotatable therein, an abutment on said shaft outwardly of said neck and spaced from the outer end of said

shaft, a nut threaded on said neck, and a yoke secured to said nut and including a cross portion in overlying engagement with said abutment, said abutment having a recess; a ratchet disc rotatable on said shaft beyond said abutment, said disc having a lug engaged in said recess for imparting rotation of said disc to said cross portion, a ratchet wrench engageable with said shaft beyond said disc and operable to rotate the shaft, and a pawl on said wrench co-operable with said disc whereby to turn the latter and therewith said yoke and nut for the purpose of advancing said shaft.

3. For use with a machine of the class described, said machine comprising a housing, a shaft, said housing including an externally threaded neck, said shaft extending through and outwardly of said neck and being rotatable therein, an abutment on said shaft outwardly of said neck and spaced from the outer end of said shaft, a nut threaded on said neck, and a swingable yoke comprising arms pivoted at diametrically opposite points to said nut and having a cross portion provided with a notch faced in the swinging direction of said yoke, said cross portion in operative relation being in overlying engagement with said abutment with a portion of said shaft disposed in said notch; a ratchet disc rotatable on said shaft beyond said abutment, said disc having a lug engaged in said recess for imparting rotation of said disc to said cross portion, a ratchet wrench engageable with said shaft beyond said disc and operable to rotate said shaft, and a pawl on said wrench co-operable with said disc whereby to turn the latter and therewith said yoke and nut for the purpose of advancing said shaft.

4. For use with a machine of the class described, said machine comprising a housing, a shaft, said housing including an externally threaded neck, said shaft extending through and outwardly of said neck and being rotatable therein, an abutment on said shaft outwardly of said neck and spaced from the outer end of said shaft, a nut threaded on said neck, and a swingable yoke comprising arms pivoted at diametrically opposite points to said nut and having a cross portion provided with a notch faced in the swinging direction of said yoke, said cross portion in operative relation being in overlying engagement with said abutment with a portion of said shaft disposed in said notch; a ratchet disc rotatable on said shaft beyond said abutment, said disc having a lug engaged in said recess for imparting rotation of said disc to said cross portion, said disc having a second lug engageable with said cross portion for maintaining the operative relation of the latter, a ratchet wrench engageable with said shaft beyond said disc and operable to rotate said shaft, and a pawl on said wrench cooperable with said disc whereby to turn the latter and therewith said yoke and nut for the purpose of advancing said shaft.

5. In combination, a housing, a shaft, said housing including an externally threaded neck, said shaft extending through and outwardly of said neck and being rotatable therein, a nut threaded on said neck, a ratchet disc on the outwardly extending portion of said shaft, a torque transmitting connection between said disc and said nut, thrust transmitting means between said nut and said shaft, a ratchet wrench engaged with said shaft for turning the latter, and a pawl on said wrench cooperable with said disc,

6. A tool of the class described comprising a ratchet wrench engageable with a shaft, said wrench including a handle, a ratchet disc pierced to receive the shaft, a normally released pawl on said wrench for cooperating with said disc, 5 a lever pivoted in longitudinally extending relation on the handle so as to be engageable by the operator's hand and swung by pressure in the same direction as that exerted to swing the handle, and a connection between said lever and said pawl operating to engage said pawl with said disc when said lever is swung.

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