F. FOSS.

SOCKET WRENCH.

APPLICATION FILED MAR. 31, 1921.

1,391,677. Patented Sept. 27, 1921.

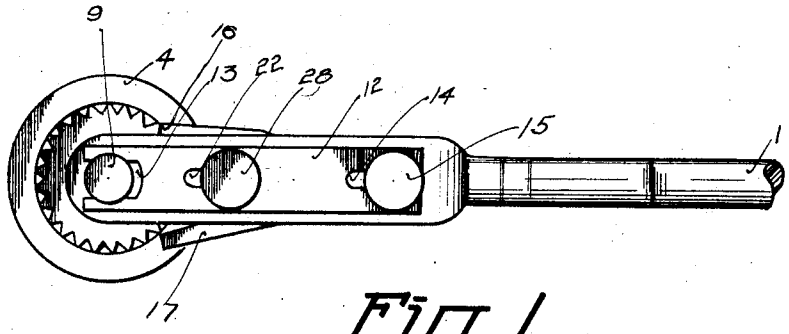


Fig. 1

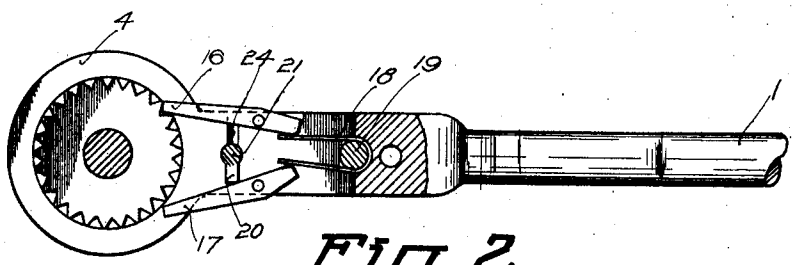


Fig. 2

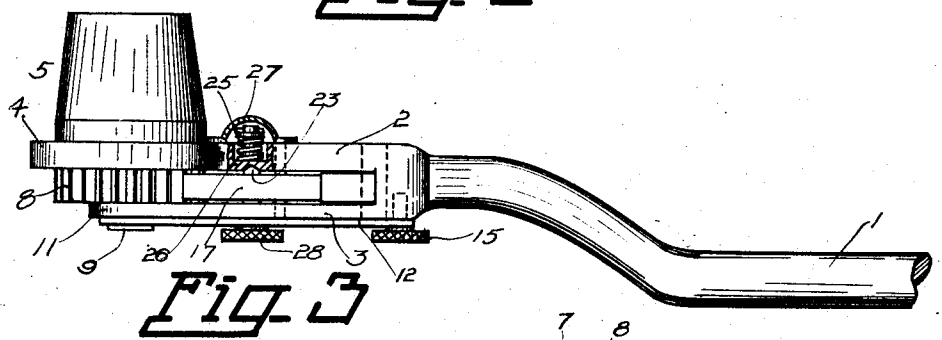


Fig. 3

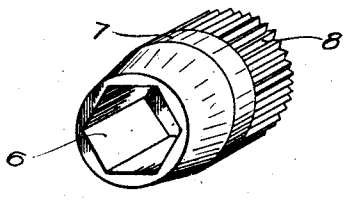


Fig. 4

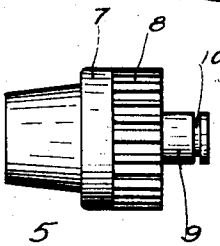


Fig. 5

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SOCKET-WRENCH.

1,391,677. Specification of Letters Patent. Patented Sept. 27, 1921.

Application filed March 31, 1921. Serial No. 457,430.

To all whom it may concern:

Be it known that I, FRED FOSS, a citizen of the United States, residing at Spokane, in Spokane county and State of Washington, have invented certain new and useful Improvements in Socket-Wrenches, of which the following is a specification.

My present invention relates to improvements in socket wrenches of that type involving the use of interchangeable socket heads having ratchets thereon, and pivoted pawls on the wrench handle or driving device engaging the ratchet head in such manner that the direction of rotation of the driven ratchet head may be reversed.

The primary object of the invention is the provision of a tool specially applicable for use in removing the rear bolts which hold the boxings for the connecting rod of the Ford type of automobiles, but while designed for this specific purpose it will of course be understood that there are numerous other uses in which the tool is applicable, and by the use of interchangeable socket heads the device is readily adapted for different sizes of bolts, &c.

By the utilization of my invention the socket head may be readily applied to the wrench, locked in position for use, and the driving devices or clutch mechanism quickly applied to the ratchet head for driving in a selected direction, as will be hereinafter more fully pointed out and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention, showing also a pair of detached heads, in which the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention, and which form has proven highly satisfactory in actual use.

Figure 1 is a side view of a wrench embodying my invention showing the slide key for locking the head to the tool.

Fig. 2 is a longitudinal sectional view of part of the wrench disclosing the driving device comprising a pair of opposed pawls in engagement with the ratchet head.

Fig. 3 is an edge view of the wrench with head in operative position, showing in section a portion of the pawl retaining device.

Fig. 4 is a perspective view showing one size of socket in the ratchet head, and Fig. 5 is a side view of a ratchet head showing its locking boss, &c.

In the preferred form of the invention as shown in the drawings I utilize a shank 1 preferably with an integral offset head comprising a pair of spaced jaws 2 and 3 of different dimensions and shape, the former having an open, enlarged end or ring 4 in which the ratchet head, indicated by the numeral 5 is supported. As shown in Figs. 4 and 5 particularly the ratchet head is fashioned with a socket portion 6 of polygonal form which may assume hexagonal shape as in Fig. 4, a smooth annular face 7 to fit within the ring 4, and an annular series of ratchet teeth 8. At the end opposite the socket the head is provided with a reduced extension or boss 9 centrally located thereon and this boss is fashioned with an annular exterior groove 10, near its outer end. In assembling the parts, the boss is inserted through the open ring 4 of the jaw 2 and into an opening 11 (dotted lines Fig. 3) of the jaw 3, the smooth annular face 7 fitting in the ring 4 and the boss fitting in the opening 11 of the jaw 3 in order that the head may be turned in the forked portion of the wrench. In this position the ratchet head is locked against displacement from the forked head by means of a slide tongue or plate 12, which is of metal and rectangular in form having an open end slot 13 whose parallel walls fit in and co-act with the groove 10 of the boss. At the opposite end of the slide plate a slot 14 is provided and the locking thumb screw 15 is passed through this slot and threaded into the forked head to clamp the slide plate in adjusted position. Thus in Fig. 1 it will be apparent that by turning the screw 15 to the left to loosen it, the slide plate may be drawn or slid to the right to disengage the parallel walls of the slot 13 from the annular groove 10, whereupon the ratchet head may be withdrawn from the forked head. The slide plate it will be understood is merely a retaining or locking medium, and the ratchet head is supported in the forked head firmly and with stability by contact of the face of the head adjacent the ratchet with the inner face of the jaw 3, and by the ring 4.

The driving device, or element clutching the shank and ratchet head together, includes a pair of pivoted pawls 16 and 17 located in the space between the jaws 2 and 3 of the forked head, with their working ends engaging, or adapted to engage the ratchet

teeth 8 of the ratchet head. A double leaf spring 18 is supported in the forked head, by a transverse pin 19, with its ends restrained under the non-working ends of the pawls, as best shown in Fig. 2, and these pawls may jointly engage the ratchet teeth 8 to hold the ratchet head for movement with the shank as it is turned in both directions. Or one of the pawls may be disengaged from the ratchet head, as in Fig. 2, in order that the head may be driven in one direction and the shank turned in reverse direction free of the head. One or the other of the pawls may be acted on for disengagement by a dog or cam arm 20 on the pintle 21, which is passed through registering openings in the two jaws 2 and 3, and also through a slot 22 in the slide plate, which slot permits adjustment of the plate. The dog has a wedge face 23 to engage in a complementary groove 24 in the inner face of the jaw 2 of the forked head, and as this groove extends across the face at both sides of the pintle 21, it will be apparent that the pintle may be turned through an arc of 180 degrees, to engage the wedge face 23 of the dog in either portion of this groove. The pintle has a spring 25 retained on its free end, and the spring is located in a recess 26 provided therefor in the outer face of the jaw 2, a cap 27 being provided as a shield for the end of the pintle and its spring. The pintle has a head 28, preferably knurled, and it will readily be apparent from the structure of Fig. 3 that the head may be grasped, the pintle shifted slightly, longitudinally to disengage the wedge faced dog from its groove against the tension of the spring 25, and then the pintle and dog turned as desired. If the dog is turned to neutral position out of contact with both pawls 16 and 17, then both pawls will engage the ratchet head, holding it rigid with the shank. Or the dog may be turned to position of Fig. 2 to free the pawl 17 from the ratchet head, leaving the pawl 16 to coöperate with the ratchet head. By turning the dog to opposite position, the pawl 16 is disengaged and the pawl 17 is brought into engagement by the spring 18.

A set of interchangeable ratchet heads may be used with the one shank, the heads having various forms or sizes of sockets for different styles of nuts or bolts, but the boss 9, ratchet 8 and smooth cylindrical portion 7 of the head remain the same in all cases, and the tool as thus constructed may be manipulated with facility for adapting it to various uses, and when in use may be handled conveniently and the proper power applied for performing its required functions.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is—

1. The combination with a shank and its forked head, of a ratchet head in said forked head and a driving device for the ratchet head, said ratchet head having a boss provided with an annular groove, and a slotted slide plate on one of the forks of said head engaging said grooved boss to prevent displacement of the ratchet head.

2. The combination with a shank having spaced jaws one of which is formed with an open ring and another with a reduced opening, of a ratchet head having a smooth portion in said ring and a projecting boss in said reduced opening, and a slotted slide plate on one of said jaws adapted to engage an annular groove on the exterior of said boss, for the purpose described.

3. The combination with a shank having spaced jaws, of a ratchet head retained therein, a pair of pawls pivoted between the jaws, a spring normally holding both pawls in engagement with said ratchet head, a rotatable pintle having a dog for selectively engaging the pawls to render them inoperative, and a wedge face on said dog adapted to engage a groove in one of the spaced jaws to hold said dog in adjusted position.

In testimony whereof I affix my signature.

FRED FOSS.