OPEN-ENDED RATCHET WRENCH

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Fig. 1

Fig. 2

Fig. 3

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The present invention relates to improvements in ratchet wrenches, and more particularly to a newly constructed, rugged, open-ended ratchet wrench.

Known types of ratchet wrenches, and particularly open-ended ratchet wrenches, unless made excessively bulky, are likely to become distorted or to collapse when repeatedly subjected to excessive strain. Obviously, a wrench that is bulky is limited in its use because many fittings requiring the application of an open-ended ratchet wrench are located in restricted positions on various types of machinery.

It is, therefore, an object of the present invention to provide an open-ended ratchet wrench with means to prevent collapse or distortion of the head under normal conditions of use and one which is exceedingly light in weight, rugged, compact and very efficient.

Another object of the present invention is to provide an open-ended ratchet wrench with newly constructed pairs of paws adapted to increase the useful life of said wrench.

Another object of the invention is to provide a ratchet wrench having a socket member located at each end thereof with common means capable of disengaging either one or the other of the socket members from its actuating paws.

Other objects of the invention will appear from the following description and accompanying drawing and will be pointed out in the annexed claims.

In the accompanying drawing there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawing:
Fig. 1 is an elevational view of an open-ended ratchet wrench embodying the features of the present invention.
Fig. 2 is a side elevational view thereof partially broken away at one end.
Fig. 3 is a planar sectional view taken substantially on line 3—3 of Fig. 2.

Referring to the accompanying drawing, in detail, the open-ended ratchet wrench illustrated consists of an elongated hollow body having a head portion at each end and an intermediate handle portion 12 connecting said head portions. The body preferably is made up of a pair of like halves 13, each fabricated of sheet steel. Each body half consists of a flat wall portion 4 and a surrounding marginal flange 5. The flanges 5 on the halves 13 are shallow and are adapted to be positioned in edge to edge contact when the halves are assembled in the manner best shown in Fig. 2. Thus, a substantially hollow body is provided.

The parts of the ratchet wrench mechanism provided in each head portion 11 of the body are substantially identical. Consequently, the following description will concern itself with the mechanism contained within one head portion only, it being understood that the description is equally applicable to the mechanism contained in the other head portion, the parts of which are identified by the same numerals.

The free end of the head portion 11 is cut away to provide a slot 16. This slot extends inwardly from said end and terminates in circular openings 17 provided in each of the body walls 14. The openings 17 constitute bearing surfaces for a circular socket member generally indicated at 18. Upon referring to Fig. 2, it will be observed that the socket member 18 has a peripheral ratchet 19 which is of a width corresponding substantially to the thickness of the body. As a consequence, the socket member 18 is rotatably retained in place.

The socket member is provided with a radial slot 21 of a width corresponding substantially to the width of the body slot 16. When the two slots are in registering alignment, the socket member may be fitted over a pipe or the like and may be subsequently moved therealong to engage the socket member over a fitting thereon. When so positioned, the wrench is adapted to be actuated in the conventional manner so as to rotate the socket member and the fitting engaged thereby step-by-step. Such step-by-step rotation of the socket member 18 is accomplished by providing a pair of coacting paws 22 and 23 in association therewith.

The paws 22 and 23 are each provided with a matching bearing lug 24 suitably apertured to receive therethrough a sleeve 25 and rivet 26 which constitute a bearing therefor. The sleeve 25 serves as a spacer and the rivet 26 extends to the outside of each of the body halves 13 and has its projecting ends riveted thereover, as at 27, to secure the body halves in their assembled relation. Each of the paws has leg portion 28 extending into the handle portion 12 of the body. The leg portions 28 are suitably arched inwardly toward each other, as at 29, for a purpose to be explained presently. A compression spring 31, arranged between the leg portions 28, normally
tends to urge said leg portions outwardly away from each other so as to hold the free end portions of the pawls in engagement with the peripheral ratchet 19. As best shown in Fig. 3, the pawl 22 has a pair of teeth 32, both of which jointly engage with the peripheral ratchet 19. The single tooth 33 which also coats the peripheral ratchet 19.

In operation, reciprocal rotation of the wrench body in one direction will cause both pawls 22 and 23 to be effective to rotate the socket member 18. When the body is reciprocally rotated in the opposite direction, both pawls slip over the teeth of the peripheral ratchet 19 for subsequent re-engagement therewith. The provision of two pawls in the present structure is necessary to avoid rendering the wrench inoperative when the radial slot 21 thereof is in registration with the teeth on either of said pawls. In such instances, the teeth or teeth of the other pawl are effective to carry the socket member into such position that the companion pawl may again become effective. It should be noted also that the pawl carrying the two teeth acts to pull the socket member. Were only a single tooth provided, the pawl would disengage itself from the ratchet almost at once when such pull is exerted.

After the object engaged by the socket member 18 has been tightened or loosened, as the case may be, it is necessary to realign the radial slot 21 in the socket member with the slot 19 in the head portion. Such realignment is required in order to permit the wrench to be removed from the pipe over which it had initially been positioned. To this end, means is provided for rendering the pawls 22 and 23 ineffective so that the socket member may be rotated freely within the head portion. Accordingly, the handle portion 12 of the body contains a cam plate 34. This cam plate has a stem 35 which extends through a longitudinal slot 35 in one of the housing halves 13. The projecting end of the stem 35 carries a finger piece 37 which may be engaged for shifting the cam plate 34 toward either head 11. In the position illustrated in Fig. 3, the cam plate is ineffective. However, upon shifting said cam plate upwardly, as viewed in Fig. 3, the opposed flanges 33 formed on the edge of a V-shaped recess 38 coat the curved ends 29 of the pawls to draw them together against the action of spring 31. When the pawl ends 29 are drawn together in the manner described, the teeth 32 and 33 thereof are carried out of engagement with the peripheral ratchet 19 and the socket member is free to rotate.

Although a preferred embodiment of the present invention has been disclosed in the accompanying drawing and described hereinabove, it is to be understood that the invention may embody various modifications in detail structure without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. An open-ended ratchet type socket wrench including a hollow radially slotted head portion and a hollow handle on said head, a socket member journaled in the head, a peripheral ratchet on said socket member, said socket member having a radial slot extending between the socket therein and its periphery, said radial socket slot being adapted to be aligned with the radial slot in the head, a pair of pawls journaled on a common bearing in said handle having teeth normally engaged with the ratchet, there being at least two teeth on one of said pawls and one tooth on the other of said pawls, tail portions on said pawls, and slide means movable in the handle toward and away from said pawls, said slide means having a cam like formation on an end engageable with the pawl tail portions to hold both pawls out of engagement with the ratchet teeth.

2. An open-ended ratchet wrench comprising a hollow body having a slotted head portion and a connecting handle portion, a socket member rotatably mounted in the head portion, said socket member having a socket opening and a radial slot extending from its periphery to said socket opening, said radial slot being adapted for alignment with the respective head slot, a peripheral ratchet on said socket member, a pair of pawls in the body to coact with the ratchet, and a cam member slidable in the handle for engagement with the pawls to disengage both pawls from the ratchet.

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