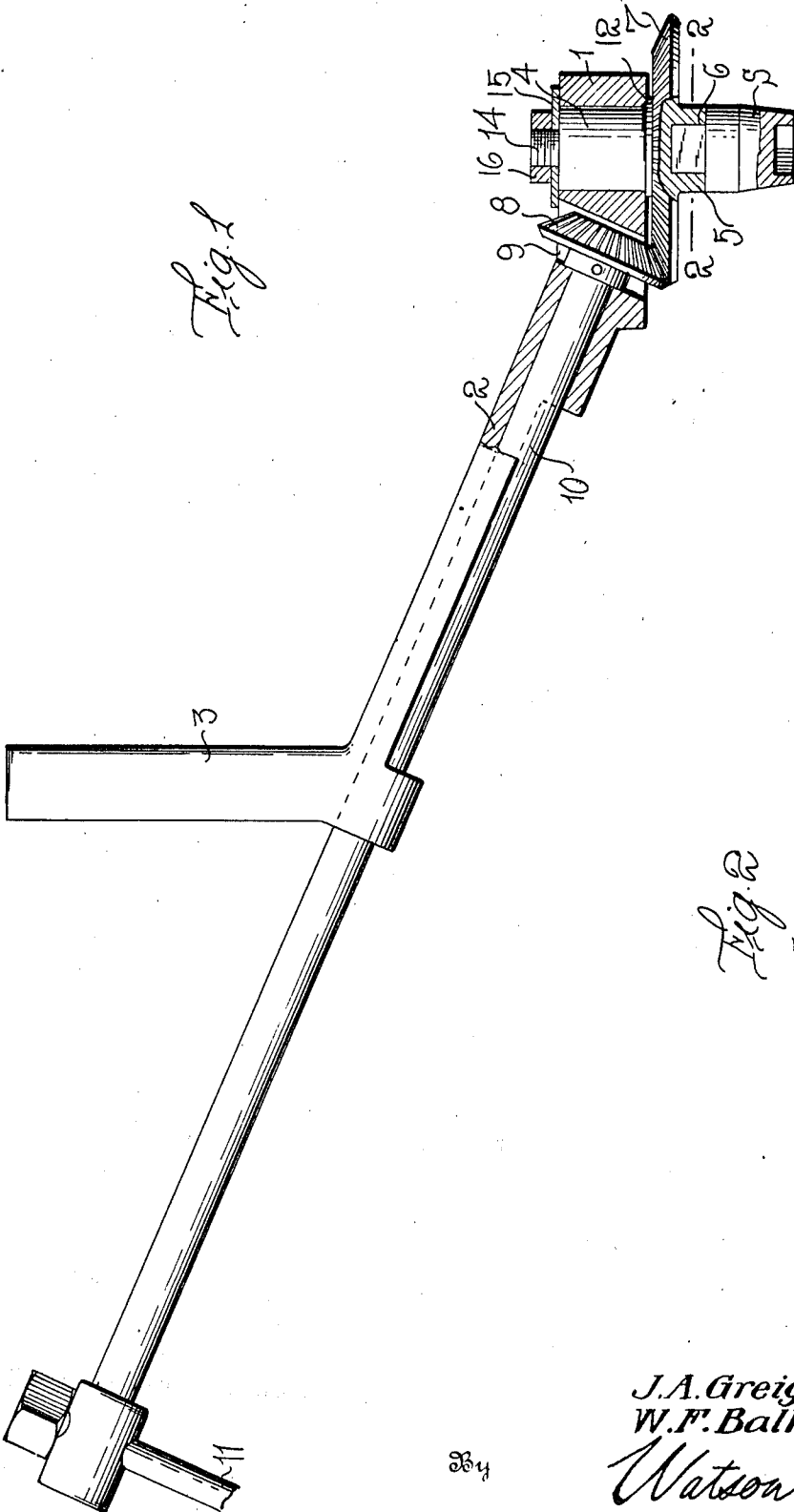


J. A. GREIG AND W. F. BALKENOL.
WRENCH.

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UNITED STATES PATENT OFFICE.

JAMES A. GREIG AND WILLIAM F. BALKENOL, OF LISMORE, MINNESOTA.

WRENCH.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JAMES A. GREIG and WILLIAM F. BALKENOL, citizens of the United States, residing at Lismore, in the county of Nobles and State of Minnesota, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to certain improvements in wrenches and has relation more particularly to a device of this general character which is gear operated and it is an object of the invention to provide a wrench having novel and improved means whereby it may be employed with convenience and facility in places which are difficult of access.

It is also an object of the invention to provide a wrench having novel and improved means whereby it may be operated by direct pull by gears or in an intermittent manner similar to a ratchet wrench.

The invention consists in the details of construction and in the combination and arrangement of the several parts of the improved wrench whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of the invention will hereinafter be definitely claimed.

In order that the invention may be the better understood, the same will now be described with reference to the accompanying drawings, wherein:

Figure 1 is a view partly in elevation and partly in section of a wrench constructed in accordance with an embodiment of the present invention; and

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1.

As disclosed in the accompanying drawings 1 denotes a head or block having extending from an end thereof an elongated member or support 2. As is particularly illustrated in Fig. 1 it is preferred that the elongated member or support 2 be disposed longitudinally on an angle of substantially 45° relative to the head or block 1. The outer end portion of the member or support 2 is provided with a rigid laterally directed extension or hand grasp 3 preferably at right angles to the head or block 1.

Extending through the head or block 1 in a plane parallel to the extension or handle 3

is a shank 4. The shank 4 is supported by the head or block 1 for rotary movement and has an end portion extending beyond the face of the head or block 1 remote from the extension or handle 3. The extended portion 5 of the shank 4 has produced in its outer end a socket 6 which may be engaged directly with the work or which may have seated therein a supplemental socket S as the occasions of practice may require. The socket S is adapted to be of a type generally employed in socket seats now generally in use.

The extended portion 5 of the shank 4 in close proximity to the head or block 1 is provided with a bevel gear 7 in mesh with a smaller gear 8 arranged within the opening 9 disposed through the head or block 1 and fixed to an end portion of the shank 10 rotatably supported by the member or support 2. The shaft 10 extends beyond the outer end of the member or support 2 and the outer end portion of the shaft 10 has slidably disposed therethrough the operating handle or lever 11.

The wrench as herein disclosed is primarily intended for use on a No. 4 connection rod of a Ford engine, although it is to be understood that the invention is not limited to this particular use. In practice the device is held by the extension or hand grasp 3 and the socket S engaged with a nut to be removed. A straight pull is imposed upon the member or support 3 which initially loosens the nut. The shaft 10 is then rotated and the nut readily removed. In applying a nut it is preferred that the shaft 10 be rotated to initially engage the nut with its work and then set the nut by imparting swinging movement to the member or support 2.

It is also to be noted that when the occasions of practice may require the socket S may be intermittently rotated in a manner similar to a ratchet by imparting pull upon the member or support 2 and then rotating the shaft 10 to roll the gear 8 back the desired distance. In view of the foregoing it will be self-evident that the improved wrench herein disclosed can be operated in three different manners. It is to be noted at this time that in practice it is preferred that the gears 7 and 8 be of a ratio of two to one.

The shank 4 as herein disclosed is maintained in applied position through the medium of an annular flange 12 engaging the

face of the block or head 1 adjacent the gear 7 while the end of the shank 4 remote from the socket 6 is provided with a threaded extension 14 which has disposed therearound a washer 15 of a maximum diameter to engage the adjacent face of the block or head 1 and in threaded engagement with the extension 14 is a holding nut 16 which coacts with the washer 15 in a conventional manner.

It is to be noted that the head 1, the member or support 2 and the extension or handle 3 are integrally formed and comprised in a single casting, and whereby the wrench is assembled with substantially two operations exclusive of the handle or lever 11. It will also be noted that by having the elongated member or support arranged on an obtuse angle with reference to the head 1 the socket is capable of engaging work not otherwise easily accessible. It will also be self evident that by having the support or member 2 on such an angle the mechanic is given greater opportunity to impose a straight pull upon the member or support without obstruction and which is particularly important in view of the fact that our improved wrench is particularly designed and adapted for use by a mechanic or the like working beneath an automobile and lying upon his back. In assembling the device it is only necessary to key the gear 8 upon the inner end of the shaft 10 and which is readily accomplished through the medium of the opening 9 and to apply the washer 15 and the nut 16 to the extension 14 of the shank 4.

From the foregoing description, it is thought to be obvious that a wrench constructed in accordance with the invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated and it will also be obvious that the invention is susceptible of some change and modification with-

out departing from the principles and spirit thereof and for this reason it is to be understood that the invention is not limited to the precise arrangement and formation of the several parts herein shown in carrying out the same in practice except as hereinafter claimed.

Having thus described the invention, what is claimed is:

A wrench comprising a head having integrally formed therewith an elongated support terminating in an integrally formed and laterally directed extension, said head immediately adjacent the support being provided with an opening and with a second opening, a shank disposed through the second opening and provided with a shoulder for contact with a face of the head, said shank being also provided with a socket in an end thereof, means engageable with the shank and coacting with the opposite face of the head for holding the shank in applied position, said shank being also provided with a gear, a shaft loosely disposed through the support and extending within the first named opening in the head, a second gear in mesh with the gear of the shank and positioned within the first opening of the head and secured to the shaft, said support being arranged on an obtuse angle relative to the head and the extension being disposed longitudinally in a direction opposite to that of the socket and in substantially the same plane.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

JAS. A. GREIG.
WM. F. BALKENOL.

Witnesses:

E. H. LOEBIG,
J. N. NICOLAY.