

Feb. 4, 1930.

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1,745,560

WRENCH

Filed April 28, 1928

2 Sheets-Sheet 1

FIG. 1.

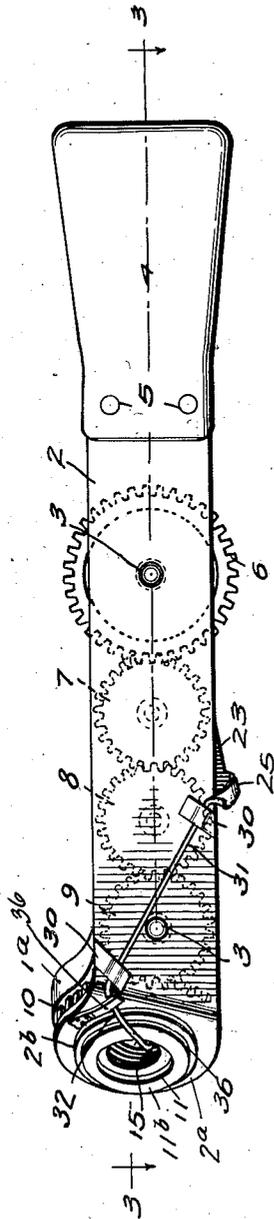


FIG. 3.

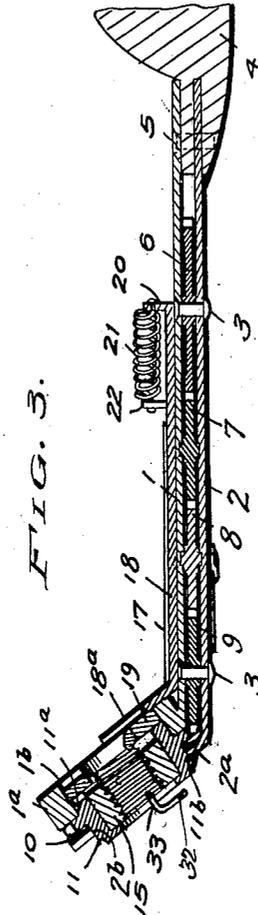
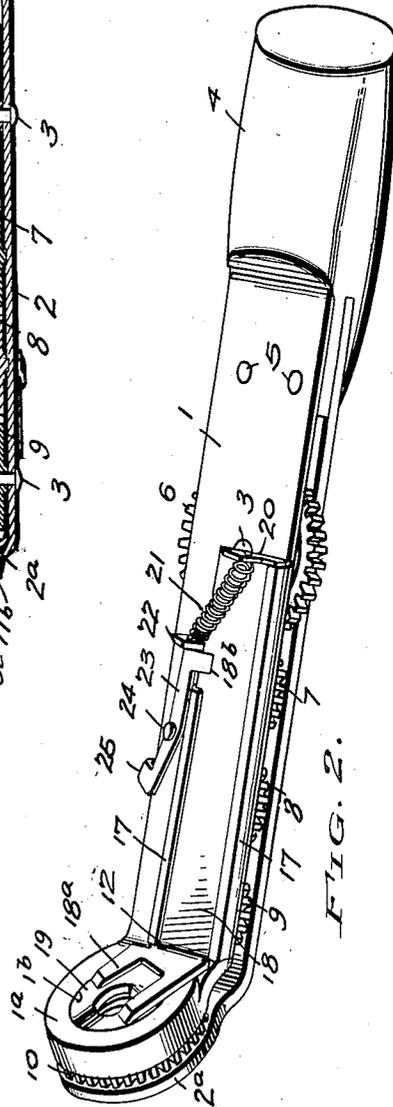


FIG. 2.



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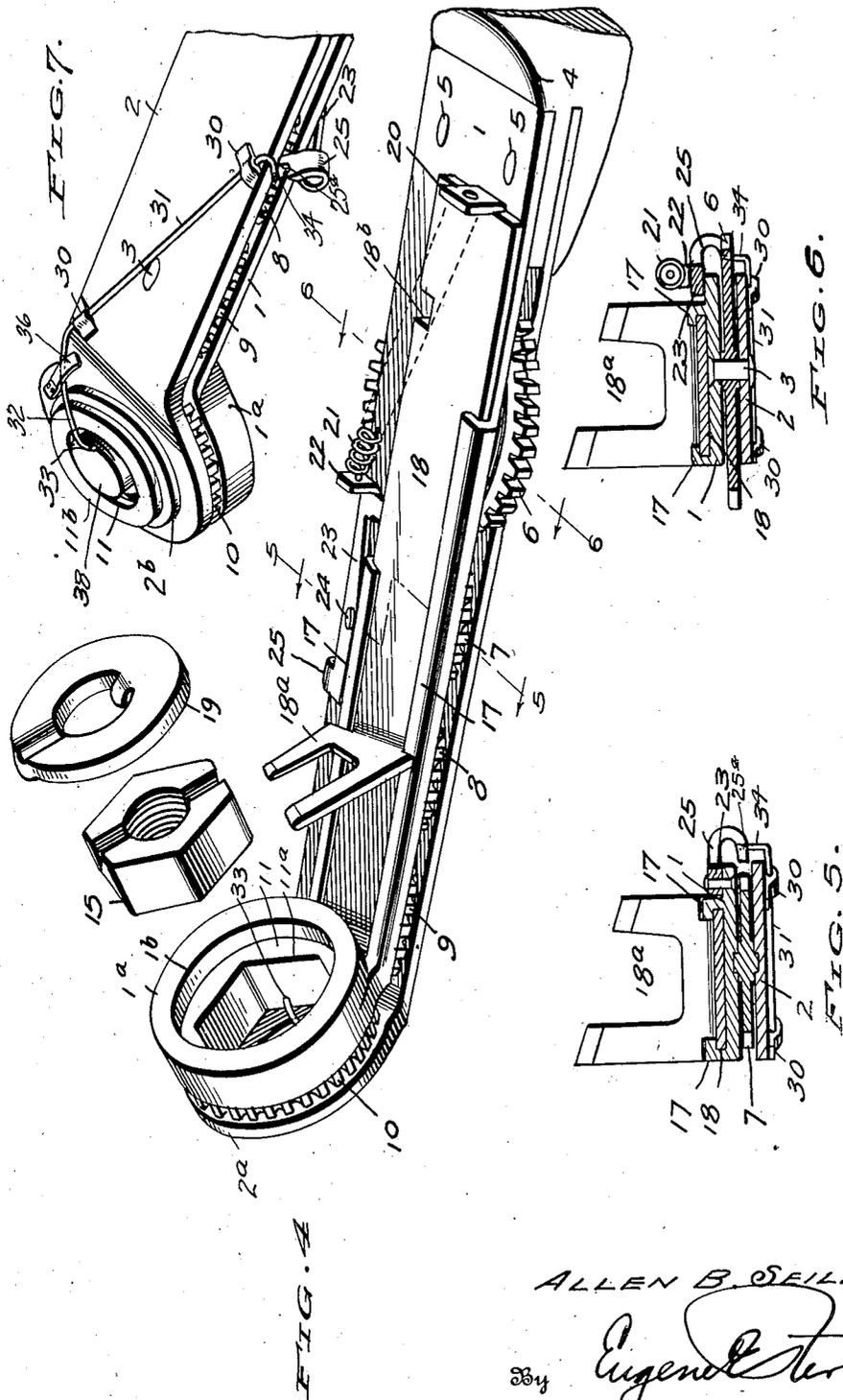
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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WRENCH

Application filed April 28, 1928. Serial No. 273,574.

My invention relates to improvements in wrenches for use in replacing or removing threaded nuts from bolts in highly restricted locations,—and has for its primary object the provision of a wrench as characterized,—which is especially for applying the nuts and lock washers employed in connection with the transmission bands of planetary gear transmissions, such as are used in some classes of motor vehicles.

A further object is to provide a wrench having means for holding a nut seated therein and manually or automatically operated means for releasing said nut holding means when the nut has been well started on its bolt.

More specifically, it is an object of the invention to provide in a wrench, as characterized, novel means for holding a nut (or a nut and lock washer) against loss while starting the same upon a threaded shank.

A still further object of the invention is to provide in a gear driven wrench a nut-loss preventing device and latch means therefor adapted to engage and lock the gear train when the nut-loss preventing device is in inoperative position.

The invention also resides in certain novel features of construction, combination, and mode of operation of the various parts to be hereinafter described and claimed, reference being had to the accompanying drawings which illustrate what now appears to be a preferred embodiment of the invention. It is to be understood, however, that the invention is susceptible of considerable change and modification over the embodiment shown and described without departing from the spirit and scope of the subject matter claimed hereinafter.

In the drawings wherein the same reference characters have been used to designate the same parts throughout,

Figure 1 is a bottom plan view of a wrench incorporating my invention;

Figure 2 is a perspective view;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a group perspective view show-

ing the nut and washer removed and their confining slide in inoperative position;

Figure 5 is a cross section on the line 5—5 of Figure 4;

Figure 6 is a section on the line 6—6 of Figure 4, and

Figure 7 is a perspective view showing the releasing latch for the slide dog.

Referring specifically to the drawings the body of the wrench comprises a pair of elongated metal plate members 1, 2 which are connected in spaced relationship by two or more rivets 3 at longitudinally spaced medial points. A handle 4 is secured at one end of the body 1, 2 by rivets or other fastening elements 5, as shown.

Between plates 1, 2 is disposed the gear train comprising the relatively large thumb actuated gear 6 adjacent handle 4 and which is journaled on one of the rivets 3; adjacent gears 7, 8 journaled in plate recesses as shown; a fourth gear 9 journaled on one of the rivets 3 and which latter gear 9 meshes with the peripheral teeth 10 of the nut receiving socket member 11.

It is proper to mention at this point that plates 1, 2 adjacent their ends remote from handle 4 are bent laterally on a bias, as indicated by dotted line 12 in Figure 2, to define a head 1^a, 2^a. In other words the head, formed by laterally bent ends 1^a, 2^a of the body 1, 2, lies in a plane disposed at an oblique angle to the plane of body 1, 2 whether the latter be viewed edgewise or facewise. The relative arrangement of head 1^a, 2^a and body 1, 2, thus, enables the wrench to be used or rather manipulated from a point above and laterally of the bolt,—as for instance from the central part of the opening of a transmission gear case,—it being understood that the bolt end is off to one side of said case.

Plate 1 has its head portion 1^a thickened, as indicated in Figure 3, it being noted that head portion 1^a is provided with a hole 1^b which acts as a bearing to receive the enlarged circular upper portion 11^a of the socket 11. The socket member 11 is supported upon the head portion 2^a of plate 2, said head portion 2^a having a hole 2^b concentric with the hole 1^b and which is adapted to receive the re-

duced lower sleeve portion 11^b of the socket member 11 below the gear teeth 10. It is to be understood, of course, that the socket member 11 will be located in place with the other members of the gear train before the plates 1, 2 are secured together by the rivets 3.

The socket member 11 has a hexagonal recess for the reception of nut 15 and the bottom of the socket member 11 is provided with a bolt passage hole, as indicated.

The plate 1 has its outer face provided with longitudinal guides 17 for guiding the locking slide 18 whose bifurcated end 18^a engages the washer 19 on either side of the bolt hole for confining said washer and the subjacent nut in place against loss.

The slide 18 has an ear 20 at its rear end which is apertured for engagement by a spring 21, the other end of which is secured in an apertured ear 22 of a locking dog 23 which is pivoted to plate 1, as at 24. The dog 23 is adapted to engage in notch 18^b of slide 18 to hold the same against retraction. Spring 21 has a dual function in that it tends to cause dog 23 to bear against the edge of slide 18 and further in that it tends to maintain slide 18 in operative position to hold the nut 15 and washer 19 in place in socket member 11.

The other end of dog 23 has a laterally bent U-shaped portion 25 which, when the dog is disengaged from notch 18^b, is adapted to be actuated between the plates 1, 2 to engage between teeth of gear 8 to lock the train against movement until such a time as the slide is moved back to operative position. It is understood that the engagement of the lug end of dog 23 with the edge of slide 18 will hold portion 25 in gear-locking position.

When operating this wrench within a planetary transmission case it is practically impossible to tell when the nut is well started on its bolt. Therefore,—as a safeguard to prevent manipulation of slide for disengagement of the wrench from the nut until the latter is well started on the bolt,—I provide the outer face of plate 2 with bearings 30 for the shank portion of a spring steel wire latch 31 whose end adjacent the head 1^a, 2^a, is bent laterally, as at 32, and then reverted slightly, as at 33 to project slightly within the bolt hole of the socket member 11 so as to lie in the path of the bolt 38 (Figure 7) as shown in Figure 3. A spring 36 secured to plate portion 2^a bears against the part 32 of wire 31 so as to yieldably hold its reverted end 33 in the position of Figure 3. The opposite end of wire lever 31 is laterally bent as at 34 so that when part 33 is in a position in the path of the bolt 38 as in Figure 3 the part 34 will lie beneath the notched forward edge 25^a of the gear locking dog part 25 to prevent depression of dog 25 to free it from the notch 18^a of slide 18. However, when the end of the bolt engages the end 33 of wire

lever 31 the latter is rocked against the action of leaf spring 36 to clear 34 from beneath dog notch 25^a. Dog 25 can now be depressed and slide 18 released.

From the foregoing description taken in connection with the accompanying drawings the novel features and advantages of my wrench will doubtless be readily understood and appreciated by those skilled in the art. The wrench is relatively inexpensive in construction and may be operated with one hand leaving the other free to perform other duties. For instance when operating upon transmission bands the free hand can be used to control the pedal and shaft of the particular drum upon which work is being done. Furthermore it will be plain that the washer 19 can be slid onto the bolt, the wrench applied to the end of the bolt with the nut therein and the slide 18 drawn back,—the release of the slide gathering or engaging the washer and seating it against the nut. The thickened portion 1^a of plate 1,—that is to say at the head of the wrench,—provides ample depth to house the washer 19 in contact with the inner end of the nut.

Inasmuch as it is possible to lock the gear train by means of dog 23 the wrench can be used as an ordinary rigid non-g geared wrench, for instance when it is desired to tighten a nut considerably or loosen one which has become very tight. Furthermore a wrench as characterized herein will effectually prevent a nut or a washer from dropping into the transmission with the incident loss of time in retrieving.

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

1. A wrench of the class described comprising a body, a nut receiving socket member, said body having a confining bearing in which said nut receiving socket member is journaled, said socket member having peripheral gear teeth, gearing carried by said body and having a driving connection with the gear teeth of said socket member, a slide member carried by said body and having one end adapted to engage a nut in said socket member to hold the same in place, a latching dog pivoted to said body and having a lug at one end, said slide having a notch with which said lug is adapted to be engaged to hold said slide in operative position, and a spring secured to said dog to hold it in engagement with said slide, and said spring being also attached to said slide to hold the same yieldably in operative position, and the other end of said dog having a portion actuated to engage and lock said gear train when the dog is swung to disengage its lug from said notch.

2. In a wrench of the class described having a socket head, said socket head being adapted to receive a nut from one end of

said socket, the other end of said socket having a hole, movable nut-confining means associated with said head, a latch for said last named means, and bolt-operated latch-releasing means alined with said socket hole.

3. In a wrench having a nut engaging portion and a nut confining means associated therewith, the combination of a bolt-operated releasing means for said confining means.

4. The combination set forth in claim 1,— and a lever carried by said body and having laterally bent end portions, one of said end portions normally engaging said dog to prevent actuation thereof to release said slide, and the other of said end portions lying adjacent said head and in the path of the bolt to be operated thereby when the nut has reached a predetermined point thereon so as to swing said lever to release said dog from the first-mentioned laterally bent end portion.

5. A wrench of the class described comprising a body provided with a nut-receiving socket, a locking slide carried by said body and having a portion adapted to overlie said socket member to confine a nut therein, latching means for holding said slide in operative position, said latching means comprising a dog pivoted to said body and having a lug, said slide having a notch adapted to receive said lug, and a yieldable connection between said locking dog and said slide whereby to cause the dog to bear against the slide and to normally retain the slide in a position to confine a nut in said socket member.

6. A wrench of the class described comprising a body having a nut receiving socket portion, said socket portion lying in a plane obliquely and laterally disposed with respect to the face and side edge planes of said body, means for confining a nut in said socket member and movable to and from operative position, means for latching said confining means in nut holding position, and yielding means connected to said confining and latching means and tending to hold both of the same in their operative positions.

7. A wrench of the class described comprising a body provided with a nut-receiving socket, a locking slide carried by said body and having a portion adapted to overlie said socket member to confine a nut therein, latching means for holding said slide in operative position, and bolt-operated releasing means for said slide-latching means and operable when the nut has assumed a predetermined position on the bolt.

8. In a geared wrench having a rotatable nut-supporting head and geared driving means therefor,—a movable member for holding the nut in the head, latching means for said nut holding member, and gear locking means carried by said latching means and operable to lock the gears against turning when the nut holding member is released.

9. The combination set forth in claim 8, and automatically operable means for releasing said latching means from said nut holding member when the nut has been advanced at predetermined distance on a bolt.

10. In a wrench having a nut-engaging portion and a nut confining means associated therewith, the combination of automatically operable releasing means for said confining means and operable when the nut has been advanced a predetermined distance on a bolt.

In testimony whereof I affix my signature.

ALLEN B. SEILHEIMER.