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WRENCH

Filed April 11, 1929

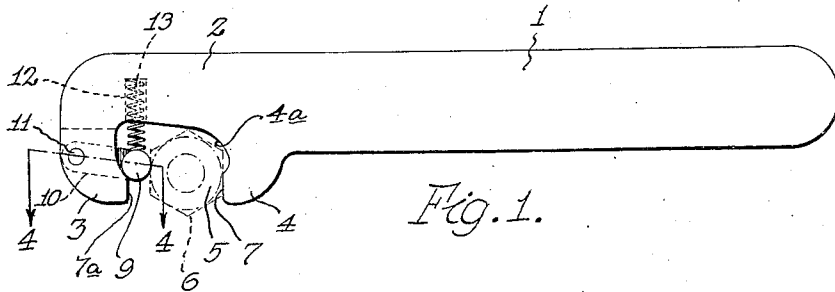


Fig. 1.

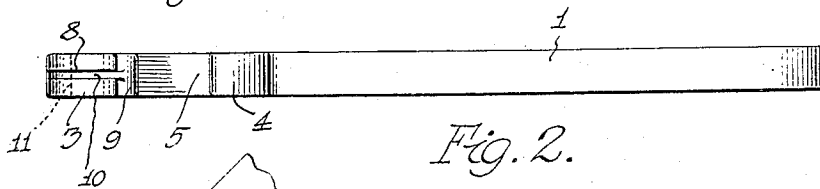


Fig. 2.

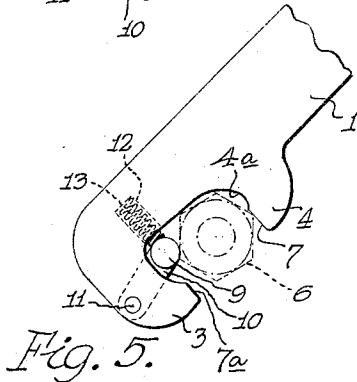


Fig. 5.

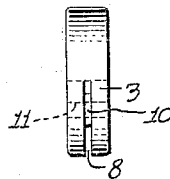


Fig. 3.

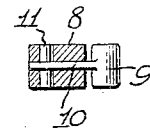


Fig. 4.

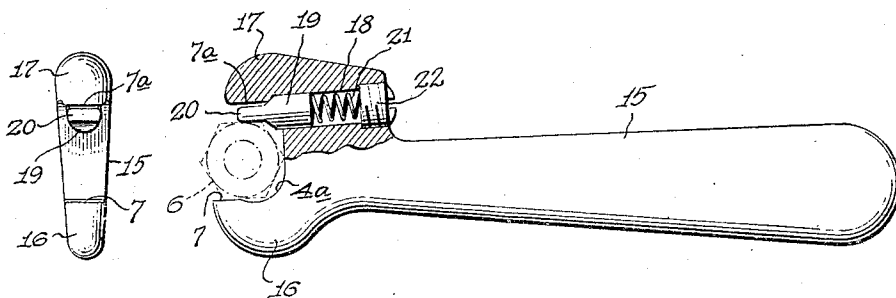


Fig. 6.

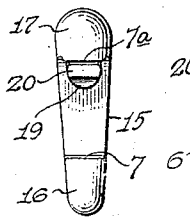


Fig. 7.

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WRENCH

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The present invention pertains to a novel wrench of the so-called ratchet type, and adapted particularly for use in connection with nuts on bolts.

5 The principal object of the invention is to provide a wrench which does not require the usual operation of removal from the nut and readjustment thereon for each turn or fraction of a turn. In order to accomplish
10 this object, one of the jaws of the wrench embodies a movable member held under spring tension and mounted in such a manner as to permit slipping of the wrench over the
15 nut in one direction and binding on the nut in the other direction after the fashion of a ratchet. Accordingly, the wrench may be operated without removal from the nut, and such action is particularly desirable in tight places.

20 The invention is fully disclosed by way of example in the following description and in the accompanying drawing, in which—

Figure 1 is a side elevation of the device applied to a nut;

25 Fig. 2 is an edge view of the wrench;

Fig. 3 is an end view of the head thereof;

Fig. 4 is a section on the line 4—4 of Figure 1;

30 Fig. 5 is a detail elevation showing the manner of slipping the wrench over the nut;

Fig. 6 is a side elevation, partly in section, of a modified construction; and

Fig. 7 is an end view thereof.

35 Reference to these views will now be made by use of like characters which are employed to designate corresponding parts throughout.

40 In Figure 1 the wrench is shown as consisting of a stock or handle 1 having at one end a head 2 formed with forward and rear integral jaws or bifurcations 3 and 4 respectively. The space 5 between these members is of sufficient width to receive a nut 6 and also to receive and permit the operation of other parts, as will presently appear. The
45 nut 6 is here shown as an hexagonal member, and the member or jaw 4 is formed with a flat end 7 for engaging one of the facets of the nut, whereby it is adapted to function as the fixed jaw of the wrench.

50 The other member or jaw 3 has a longitu-

dinal slot 8 therethrough, shown more clearly in Figures 3 and 4. In the slot is pivotally mounted a movable wedge member adapted to co-operate with the jaw 3 and which member consists of a head 9 disposed in the space 5
55 and a stem 10 extending therefrom into the slot and pivotally held therein by a pin 11. The head is of substantially equal length to the thickness of the member 3 and obviously is capable of oscillation in the space 5 because of its pivotal attachment to the member
60 3 by means of the pin 11.

The faces 7 and 7a of the jaws 4 and 3 respectively are parallel and spaced far enough apart to permit the free entrance
65 therebetween of the nut in any position thereof and therefore the wrench may be easily applied laterally of the nut and the depth of the space between the jaws is such that when the nut is in contact with the bottom of this
70 space the nut will be in position to be engaged by the face 7. Further, this space is enlarged or cut away slightly as at 4a, inwardly of the face 7 at the base of the jaw 4 so that clearance is provided for the corner or
75 angle of the nut in turning the wrench relative thereto.

In the head proper, or in the main portion thereof between the jaws 3 and 4, is formed a socket 12 in which is seated one end
80 of a coil spring 13. The other end of the spring bears on the head 9 as clearly shown in Figures 1 and 5.

85 Assuming that the wrench has been placed with its jaws spanning the nut with the wedge member or head 9 in contact with one face of the nut as shown in Figure 1 and the handle swung downwardly, there will be a tendency for the head 9 to wedge between the face of the nut and the face 7a of the jaw 3, as a result of which the nut will be
90 turned. In taking a fresh grip on the nut, the handle 1 is turned upwardly as shown in Figure 5, the head being swung toward the inner end of the space between the jaws by its engagement with the next succeeding
95 angle of the nut and as the jaw 4 passes the corner of the nut inwardly of said jaw, and engages the flat, the angle of the nut adjacent said head 9 will swing past said head
100

which is immediately projected into engagement with the next flat of the nut in position to wedge between said flat and face 7a of the jaw 3. By relieving or cutting away the body as at 4a at the base of the jaw 4, a space is provided within which the next succeeding angle may move, thus permitting the angle of the nut adjacent the head 9 to pass said head.

10 In Figures 6 and 7 is shown a modification wherein the handle 15 is substantially parallel to the jaws 16 and 17 of the head. The former is shaped to serve as a fixed jaw, and in the other jaw is formed a socket 18
15 in which is slidably mounted a pin 19 having a flattened end 20 adapted to wedge between said jaw and a face of the nut. Behind the pin is a spring 21 within the cavity and backed by a plug 22 which closes the
20 rearward end of the cavity. The jaw 16 and the flattened end 20 may engage parallel faces of the nut whereby, when the handle 15 is turned downwardly, the nut will be bound and turned. In moving the handle
25 in the other direction, the pin 20 is retracted into the socket 18 by a forward corner of the nut, whereupon said pin is projected by the spring into the space between the flat of the nut and the face 7a of the jaw 17, the flat-
30 tened end 20 wedging into said space. As the space between the faces 7 and 7a of the jaws is greater than the over-all of the nut, the wrench may be readily applied at the nut, laterally thereof.

35 As will be seen, the distance spacing of the movable member or head and the opposite jaw is such as to freely receive the nut when the latter is entered with its opposing flat sides parallel with the direction of relative movement of nut and wrench in applying the wrench to the nut, but such distance is less than that of opposing nut angles; in other words, the distance is not less than the minor axis of the nut but less than the
45 greater axis of the nut, such axes being considered as perpendicular to the thread axis of the nut. In addition, the direction of yield of the movable member corresponds approximately with such direction of relative movement of nut and wrench, so that
50 yield must take place should the attempt be made to apply the wrench to the major axis.

One of the results of this is the fact that the thrust on the movable member or head, during the drive movement of the nut, is taken up directly by the jaw which carries the member and without placing any pressure whatever upon the part of the member which projects from the head. In other words, the
60 direction of thrust is practically transverse to the direction of the head extension—the stem 10 or part 19—so that the latter is not called upon to sustain any pressure, and can therefore be relatively light, with a consequent ability to employ a slot of small di-

mensions, thus enabling the structure to be applied to a wrench of comparatively small thickness.

In use, the thrust of the head is applied on to the flat face of the nut instead of on to the angle of the nut, thus eliminating liability of rounding the corners of the nut.

Although specific embodiments of my invention have been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention as indicated by the appended claims.

What I claim is:—

1. A wrench comprising a bifurcated head with the space between said bifurcations permanently of greater width than the extreme distance across the nut, a member supported by the head and retractable by the engagement therewith of an angle of the nut, the retracting movement corresponding approximately to the direction of relative movement of nut and wrench when the latter is applied to the nut, and means for projecting said member into the space between a flat of the nut and an adjacent jaw to wedge therebetween and turn the nut when said wrench is turned in one direction, the wedging pressure of the member on the jaw being limited in application to a face of the jaw facing such space.

2. A wrench comprising a bifurcated head adapted to receive therein a nut, said bifurcations being shaped to serve as fixed jaws, a movable member pivotally attached to one of said jaws to swing into the space between said jaw and the flat of the nut, the pivot point being such that the swinging movement of the member corresponds approximately with the direction of relative movement of nut and wrench when the latter is applied to the nut, the relation of head, pivot and member being such that the pivot will be free from thrust pressure during driving of the nut.

3. A wrench comprising a bifurcated head forming jaws having parallel faces adapted to receive a nut therebetween, a wedge member adapted to be projected into engagement with the face of one jaw to be located between said face and the flat of the nut, said head being cut away inwardly of the face of the other jaw to receive and permit the passage of a nut angle during ratcheting of the wrench about the nut, and a spring to project said member.

4. A wrench comprising a bifurcated head forming opposed fixed jaws to receive a nut therebetween, one of said jaws being slotted longitudinally, a wedge member including a stem pivotally mounted in said slot and having a head disposed in the space between said jaws, and a spring in said head bearing on said wedge member to swing the same, the pivot point being such that the swinging

movement of the member corresponds approximately with the direction of relative movement of nut and wrench when the latter is applied to the nut, the relation of head, pivot and member being such that the pivot will be free from thrust pressure during driving of the nut.

5. In wrench structures for manipulating nuts and wherein the wrench is applied perpendicular to the thread axis of the nut, a pair of fixed jaws spaced apart to permit entrance of the nut with the spacing of permanently greater width than the greatest overall distance across the nut, a yieldable head carried by one of the jaws and co-operating with the other jaw to grip the nut to drive the latter in the desired direction when the head is in normal position, said head being freely yieldable to permit ratcheting of the wrench when moved in the opposite direction, the gripping faces of head and jaw, in normal position, being spaced a distance not less than a minor axis of the nut and less than a major axis of the nut, the position of the head in normal position being such as to cause the head to be directly supported by its jaw to form a rigid wedge element between such jaw and a nut facet when the nut is being driven, the movement of the head to and from its normal position being in a direction corresponding approximately to the direction of relative movement of nut and wrench when applying the wrench to the nut.

6. A wrench structure as in claim 5 characterized in that the movable head is pivotally supported by its jaw, with the pivot point so positioned that the thrust pressure through the head during driving of the nut is exerted in a direction transverse to a line connecting the pivot axis and such head.

7. A wrench as in claim 3 characterized in that the depth of the cut-away portion of the jaws is insufficient to permit opposite angles of the nut to lie inside of a line connecting the working faces of the member and opposite jaw.

In testimony whereof I affix my signature.
BURTON H. PARKER.