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A. H. THOMPSON
WRENCH FOR LOCK NUTS

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Fig. 1

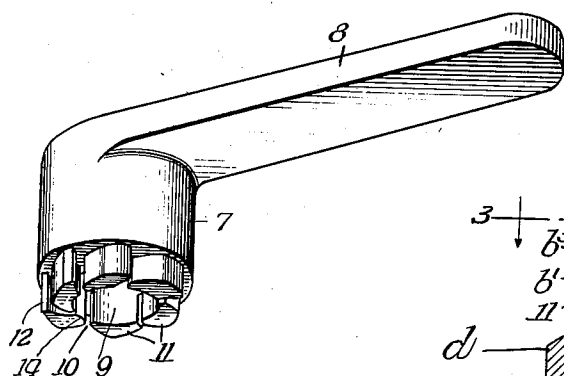


Fig. 2

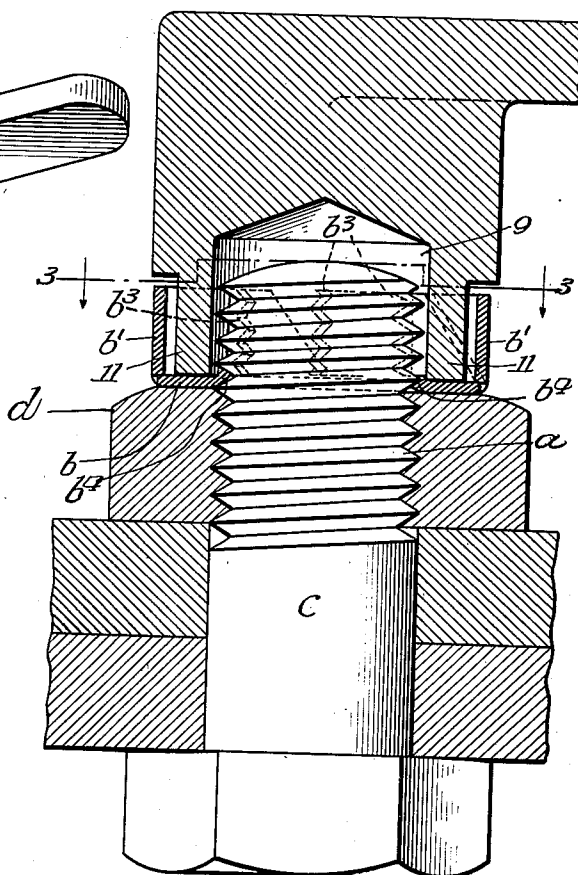


Fig. 3

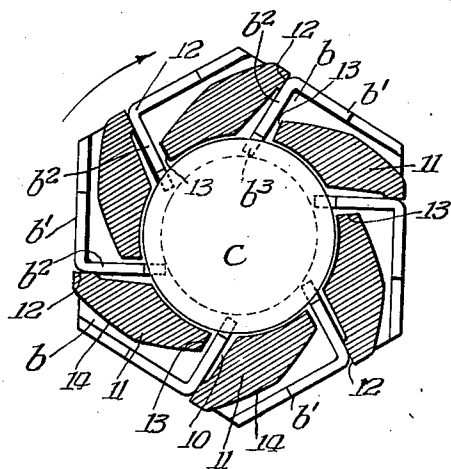
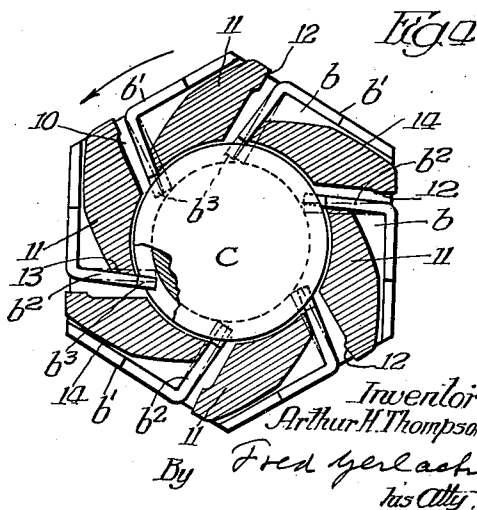


Fig. 4



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WRENCH FOR LOCK NUTS

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4 Claims. (Cl. 81—90)

The invention relates to wrenches for lock-nuts.

The object of the invention is to provide an improved wrench which is adapted for use with lock-nut of the type in which resilient tongues are used to lock the nut against backward rotation. It is desirable to provide a single tool whereby the tongues of a nut of this type will be flexed to disengage them from the screw-thread when the nut is to be removed from the screw and whereby rigid portions of the nut will be engaged in turning the nut on the screw to engage the work.

Another object of the invention is to provide the wrench which is adapted to release the tongues when the nut is to be turned off the screw, with abutments for engaging rigid portions of the nut after the tongues have been flexed a predetermined extent and released from the screw so that, in the event of excessive resistance of the nut to rotation of the screw, the tongues will be relieved of excess stresses.

Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawing: Fig. 1 is a perspective of a wrench embodying the invention. Fig. 2 is a section of the wrench applied to a nut. Fig. 3 is a section taken on line 3—3 of Fig. 2, illustrating the operation of the wrench in turning the nut onto a screw and to engage the work. Fig. 4 is a similar section illustrating the wrench in turning the nut to release the tongues and removing the nut from the screw.

The invention is exemplified in a wrench, which comprises a body 7, which is provided with a handle 8 of any suitable form for turning purposes. The body 7 is provided in its under-face with a cylindrical socket 9 for receiving the screw *a*.

The wrench is adapted for use with a lock-nut which is formed of sheet metal and comprises a plate *b* for engaging the work, hexagonally-arranged up-turned integral flanges *b*¹ forming sides, and resilient tongues *b*² which are integral with the flanges *b*¹ and provided with V-shaped teeth *b*³ for engaging the angular side-faces of the screw-thread on a screw *c*. Tongues *b*² and teeth *b*³ extend inwardly from flanges *b*¹ in such angular directions that, when the inner toothed ends of the tongues engage the side-faces of the screw-thread and rotative

stresses are applied to the nut in the direction necessary to remove the nut from the screw, the tongues will be stressed toward their dead-centers between their outer ends and the axis of the screw and, when rotated in the opposite direction, the tongues will be free to flex and slide around the screw-thread. When it is desired to unscrew the nut, it is necessary to flex the tongues *b*² away from their dead-centers to permit the nut to be removed from the screw.

The plate *b* is formed with a hole through which the screw *a* can pass and this hole has a helical rim *b*⁴ for engaging the thread on said screw.

The wall of the body 7 surrounding the socket 9 is provided with a series of slots which extend upwardly from the bottom-face of the body and are adapted to receive the tongues *b*² of the nut. The members 11 of the body between slots 10 are adapted to differentially engage the nut for turning it onto or off the screw. Members 11 are each shaped to form an abutment 12 which is adapted to engage the nut adjacent the end of a flange *b*¹ which forms the root of the flexible tongue *b*² when the wrench is turned to force the nut onto the screw and against the work. These abutments 12, during this turning of the nut, are arranged to thus engage the nut at rigid portions thereof so force can be positively applied through the wrench to jam the nut against the work. Each member 11, at its other end, is provided with an abutment 13, which is adapted to engage the inner or flexible end of the tongue *b*² when the wrench is turned to remove the nut from the screw. Each member 11 is also provided with an abutment 14 which is shaped and adapted to engage the inner face of a flange *b*¹ which is rigid with the nut after the abutment 13 has flexed the tongue sufficiently to disengage its inner end from the screw when the wrench is turned to remove the nut from the screw. In Fig. 2, the nut is shown as used for locking an ordinary nut *d* on the screw *a*.

In the use of the wrench, the members 11 are placed between tongues *b*² and flanges *b*¹, as shown in Figs. 3 and 4. The outer end of screw *c* will pass into socket 9 and position the wrench for rotation around the screw. When the nut is to be turned onto the screw and into engagement with the work, the wrench will be correspondingly turned and abutments 12 will engage the contiguous ends of flanges *b*¹ and apply force substantially in the plane of said flanges, which are rigid with the nut, so that the necessary force for turning the nut and

jamming it against the work can be positively applied through the wrench.

When the nut is to be unscrewed, the wrench will be rotated in the opposite direction and abutments 13 will engage the side-faces of tongues b^2 near their free ends and teeth b^3 and flex them away from the screw a sufficient distance to disengage the teeth therefrom and release the nut so it can be readily turned off the screw. After the necessary flexing of the tongues b^2 by abutments 13 for releasing them from the screw has been effected, if the nut is jammed on the screw or against the work, abutments 14 will engage the inner faces of flanges b^1 which are rigid with the nut during the turning of the wrench in unscrewing the nut from the screw. As a result, in the event that the nut is tightly jammed against the work or rusted onto the screw, the abutments 14 will engage rigid portions of the nut after the tongues have been released and thereby prevent excessive bending or breaking of the tongues. There is sufficient clearance between the abutments 12, 13 and 14 and the portions of the nut engaged thereby to render them effective alternately according to the direction in which the wrench is turned.

The invention exemplifies a wrench which is adapted to release the resilient tongues of the nut so the nut can be turned off the screw and is also adapted to engage rigid portions of the nut for turning it on the screw and against the work. It also exemplifies a wrench with means for preventing excessive flexing of the tongues by the wrench during the turning of the nut off the screw.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

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

1. A wrench for use on a lock-nut which is provided with resilient tongues having their outer ends united to the nut and their inner ends adapted to secure the nut against rotation off the screw and to slide around the screw when the nut is turned onto the screw and with substantially rigid portions adjacent the outer margin of the nut, comprising a body having a socket to receive the screw and spaced nut-engaging members on the body circumferentially arranged around the screw and shaped for endwise insertion, and so as to permit limited rotation, between the resilient tongues, said members being each shaped to form a pair of abutments, one of which is disposed in close proximity to the periphery of the screw and adapted to engage one side of a tongue and to flex the tongue away from the screw, and the other disposed outwardly from the periphery of the screw a sufficient distance to engage a rigid portion adjacent the margin of the nut when the nut is turned onto the screw, the rotation of the members in opposite directions alternately producing release of the inner ends of the tongues from the screw

and positive rotation while the tongues remain engaged with the screw.

2. A wrench for use on a lock nut which is provided with resilient tongues having their outer ends united to the nut and their inner ends adapted to secure the nut against rotation off the screw and to slide around the screw when the nut is turned onto the screw and with substantially rigid portions adjacent the outer margin of the nut, comprising a body having a socket to receive the screw and spaced nut-engaging members on the body circumferentially arranged around the screw, and shaped for endwise insertion and so as to permit limited rotation between the resilient tongues, each of said members being shaped to form a pair of relatively angled abutments, one of which is disposed in close proximity to the periphery of the screw and adapted to engage one side of a tongue and to flex the tongue away from the screw, and the other disposed outwardly from the periphery of the screw sufficiently to engage a rigid portion of the nut adjacent the margin of the nut and positively rotate the nut when it is turned off the screw, and after the inner end of the tongue has been flexed a predetermined distance away from the screw.

3. A wrench for use on a lock-nut which is provided with upstanding substantially rigid marginal flanges and resilient tongues extending radially inward from the flanges for securing the nut against rotation off the screw and adapted to slide around the screw when the nut is turned onto the screw, comprising a body provided with a socket to receive the screw and nut-engaging members circumferentially arranged around the screw with slots between them for receiving the tongues and shaped for endwise insertion between the tongues and within the flanges, said members being each shaped to form an abutment which is disposed to engage the inner end of a tongue and to flex the tongue away from the screw, and an abutment adapted to engage the outer portion of the tongue adjacent a flange for positive rotation of the nut onto the screw.

4. A wrench for use on a lock-nut which is provided with upstanding marginal flanges and resilient tongues extending radially inward from the flanges for securing the nut against rotation off the screw and adapted to slide around the screw when the nut is turned onto the screw, comprising a body provided with a socket to receive the screw and nut-engaged members circumferentially arranged around the screw with slots between them for receiving the tongues and shaped for endwise insertion between the tongues and within the flanges, said members being each provided with an abutment which is disposed to engage the inner end of a tongue and to flex the tongue away from the screw, an abutment adapted to engage the inner side of the flange when the tongue has been flexed a predetermined extent in turning the nut off the screw, and an abutment adapted to engage the outer portion of the tongue adjacent a flange for positive rotation of the nut onto the screw.

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