

(No Model.)

H. C. LONG.
AXLE NUT WRENCH.

No. 567,987.

Patented Sept. 22, 1896.

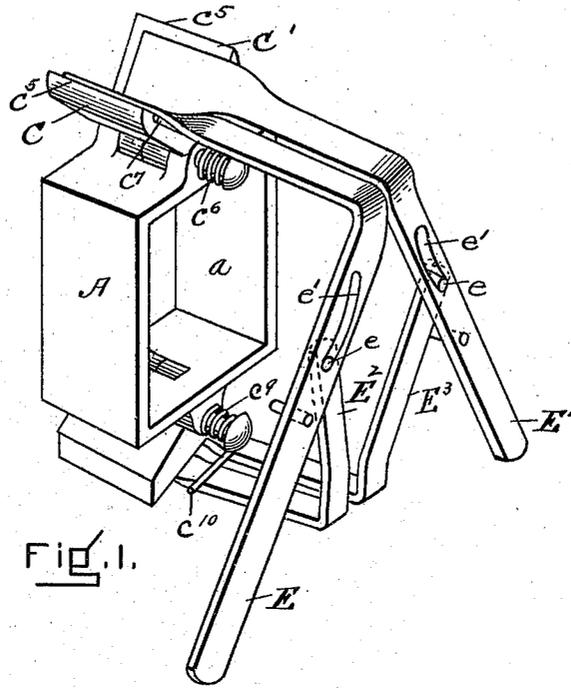


Fig. 1.

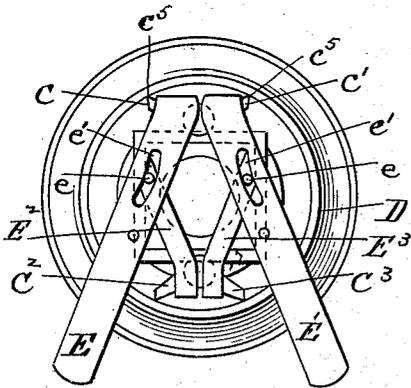


Fig. 2.

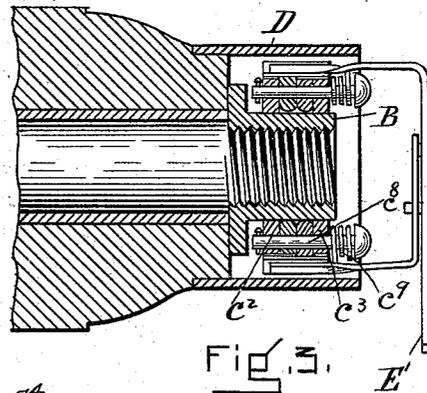


Fig. 3.

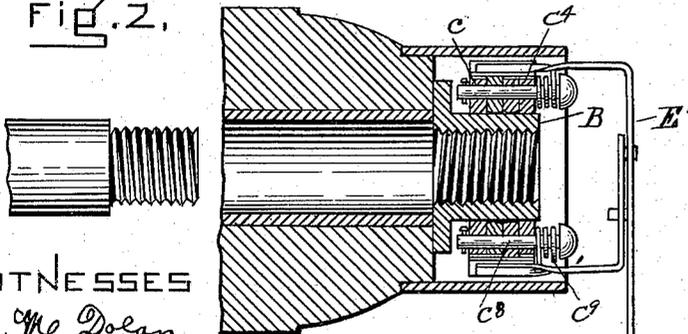


Fig. 4.

WITNESSES

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HENRY CRAWFORD LONG, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO R. CURRIE GROVESTEN, OF SAME PLACE.

AXLE-NUT WRENCH.

SPECIFICATION forming part of Letters Patent No. 567,987, dated September 22, 1896.

Application filed February 24, 1896. Serial No. 580,368. (No model.)

To all whom it may concern:

Be it known that I, HENRY CRAWFORD LONG, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Axle-Nut Wrenches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a wrench for the removal of axle-nuts by the wheel, comprising a metallic housing or casing of the shape of the nut for inclosing it or surrounding it upon its sides, and to which automatically-actuating devices in the form of oppositely arranged and acting dogs to lay hold of or engage the inner surface of the hub-ring are attached, the dogs being provided with means whereby they are opened or separated for the purpose of permitting the placing of the wrench upon the nut and within the cavity of the hub, and with springs by which upon the release of these means the dogs automatically connect the housing or boxing with the hub-ring.

In the drawings, Figure 1 is a view in perspective of my improved wrench. Fig. 2 represents it in elevation engaged with a nut and with the rim of a hub. Fig. 3 is a view in vertical section taken through a part of the hub, the axle-nut, and wrench. Fig. 4 shows the hub, nut, and wrench as detached from the end of the axle.

Referring to the drawings, A represents a metallic housing or box having an interior space or cavity a of a size to fit loosely upon the axle-nut B. This box or nut-holder has formed upon its outer space in opposed relation to each other two pairs of ears c' and c^2 . The ears c' hold the pivot c^4 , to which are pivoted the dogs C C' in opposed relation to each other and each of which has the sharp engaging edge c^5 . The pivot c^4 is extended beyond one ear sufficiently to receive the coiled spring c^6 , the ends c^7 of which bear against the dogs and tend to move them toward each other. The ears c^2 support the pivot c^8 , to which the dogs C² C³ are hinged. These dogs are similar in shape to the dogs

C C', and the pivot c^8 carries the coil-spring c^9 , the ends c^{10} of which act upon the dogs C² C³ to move them toward each other.

To insert the nut-holder and dogs within the recess formed by the rim D of a wheel, it is necessary that the dogs be opened or brought to a flat position in relation to the sides of the holder and in opposition to the stress of their closing-springs, and one way of accomplishing this is provided by means of the arms E E', preferably made of flat metal and having their ends bent inwardly at an angle and attached, respectively, to the outer surfaces of the dogs C C'. (See Fig. 1.) The movement of these arms toward each other will flatten or open the two dogs C C'. To flatten or open the dogs C² C³, arms E² E³ are connected with them by arms E² E³, which are attached to the outer surface of the dogs and also to the arms E E' by the pins e , which enter the slots e' in the arms. (See Fig. 2.) The slots are preferably curved, and the pins e may have frictional rolls. The arms E E' also have stationary pins e^2 to close against the outer edges of the arms E² E³, whereby the action of the arms is made uniform and equalized and the four dogs uniformly opened or moved.

The nut-holder A may be of any desired size and is adapted to receive, within a limited range, nuts varying in diameter. Any suitable form of dog-closing spring may be used in lieu of that described, and any other equivalent means for opening them and holding them open against the spring-pressure may be employed.

It will be seen that the dogs are arranged in opposing pairs and that each dog of each pair also opposes the action of the other, and to use the same the dogs are flattened sufficiently to permit the nut-holder to be placed upon the nut and the dogs to be entered in the recess inclosed by the hub-rim, and that the dogs are then released and, moving outwardly, close upon the inner surface of the rim, gripping it tightly and confining the nut-holder within its wall, so that it is rigidly locked to it and cannot be moved in either direction, and consequently upon the turning of the wheel in the proper direction, it having been lifted from the ground, the nut, being locked by the holder and dogs to the hub,

will be rotated with the wheel and unscrewed from the axle end.

It will also be seen that the nut-holder maintains its connection or grip upon the hub-rim after the removal of the nut, and then serves to hold the detached nut to the hub, as the nut cannot be moved laterally from the hub end because of the hub and the flange on the nut, and it is therefore in a position to be restored to the axle, with the wheel to which it is attached, by turning the wheel in the desired direction for screwing the nut upon the axle end. It will be seen that this affords a powerful and desirable means for removing the nut, and that it also does away with the necessity for handling the nut.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The axle-nut wrench herein described, the same comprising a nut-holder and two pairs of oppositely-arranged dogs pivoted to the holder in opposed relation to each other, springs for closing or moving outwardly said dogs, the said dogs being adapted to lock the holder to the inner surface of a hub-rim, as and for the purposes described.

2. An axle-nut wrench having a nut-holder, the dogs C, C' secured thereto by the pivot c^4 and their actuating-springs and the dogs C², C³ pivoted to the holder by the pivot c^3 , and their actuating-springs, as and for the purposes described.

3. The combination of the nut-holder A having the two pairs of ears c , c' and c^2 , c^3 , the dogs C, C' secured to the pivots c , c' by the pivot c^4 , the said pivot having an exten-

sion upon which is mounted a coiled spring, the ends of which bear against the said dogs C, C', the dogs C², C³ attached to the ears c^2 , c^3 by the pivot c^3 , the said pivot extending beyond one ear and carrying a coiled spring, the ends of which bear against said dogs C², C³, all as and for the purposes described.

4. The axle-nut wrench having a nut-holder, the spring-actuated gripping-dogs arranged in opposed relation to each other, and attached to the holder, and adapted to secure the holder to the inner rim of the hub, with devices connected with the dogs for opening or flattening them in opposition to the stress of their closing-springs, as and for the purposes described.

5. The combination in a wrench of the character specified, of the nut-holder, the oppositely-arranged spring-actuated gripping-dogs, arms extending from the dogs connected with each other, whereby their movement toward each other opens or flattens the dogs, and their reverse movement permits the springs to actuate them.

6. The combination in a wrench of the character specified, of the nut-holder, the dogs C, C' and C², C³ attached thereto, as specified, springs for moving them in one direction and the arms E, E' connected with the dogs C, C' and having slots e' with the arms E², E³ connected with the dogs C², C³, having pins e to enter the slots e' of the arms E, E', respectively, as and for the purposes described.

HENRY CRAWFORD LONG.

In presence of—

J. M. DOLAN,

F. F. RAYMOND, 2d.