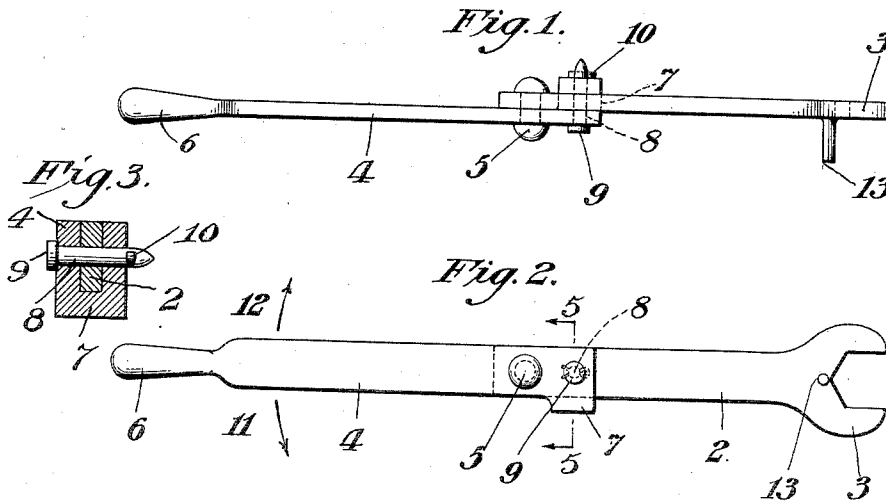


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WRENCH.

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1,099,079.

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WITNESSES:

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WRENCH.

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To all whom it may concern:

Be it known that I, CHARLES A. ALDEN, a citizen of the United States, residing at Steelton, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

Metal bolts, as generally constructed, are longitudinally elastic within certain limits; and when a nut is applied to a bolt and tightened against the structure through which the bolt extends until the bolt is stretched to a point within its elastic limit, the bolt will tend to contract, according to its elastic nature, and thereby press and hold the parts of the bolted structure firmly between the head on one end of the bolt and the nut screwed on to the other end thereof. The object of my invention is to overcome the disadvantage of stretching bolts beyond their elastic limits, by the provision of a wrench which may be applied to a nut on a bolt, and which may act as a lever under hand pressure to tighten the bolt, and which involves in its construction and principle of operation a nut engaging member, a hand operated member or lever and a breakable connection between the two members, the whole being constructed and arranged so that sufficient leverage will be provided to permit the bolt to be properly tightened by hand without the application of excessive muscular force, and so that the breakable connection will give way before sufficient force has been applied to stretch the bolt beyond its elastic limit. The wrench may also be used to insure the application of sufficient force to tighten the bolt to the desired extent by regulating the strength of the breakable connection and requiring that it shall be broken each time a bolt is tightened.

A further object of my invention is to construct a wrench so that when it is applied to a nut and moved in one direction, the breakable connection will be broken for the purpose previously mentioned, and when the wrench is moved in the reverse direction, the breakable connection will be prevented from breaking, causing the two members forming the wrench to move as a unit under any force for loosening nuts and for other purposes; and a further object of my invention is to provide various and advantageous features of construction and com-

binations of parts which will be hereinafter fully described and particularly claimed.

In the accompanying drawings, illustrating my invention: Figure 1, is a top view of a wrench illustrating one form of embodiment of my invention. Fig. 2, is a side view of the wrench shown in Fig. 1. Fig. 3 is a section on line 5—5 of Fig. 2.

2 designates a flat, elongated, nut-engaging member having a nut-embracing part 3 formed on one end thereof. The other end of the member 2 extends adjacent to and overlaps one end of a flat elongated member or lever 4 having its overlapping end portion pivoted on the overlapping end portion of the member 2 by means of a pin or rivet 5 which extends transversely through the member 2 and lever 4 and has heads formed on the ends thereof preventing separation of the member and lever and permitting the lever to move on its pivot. The free outer end of the lever 4 terminates in a suitable handle 6 by means of which the lever may be actuated by hand.

The inner end of the lever 4 extends around one edge of and embraces the member 2 and provides a stop 7 which engages one edge of the member 2 and prevents movement of the lever 4 on its pivot 5 in the direction of the arrow 11, in Fig. 2.

A breakable connection is provided between the member 2 and lever 3, which connection holds the stop part 7 normally in the position shown adjacent the edge of the member 2 and which is adapted to be broken when pressure is applied to the handle 4 in the direction of the arrow 12, in Fig. 2, when the movement of the nut-engaging member 2 is retarded sufficiently to overcome the strength of the breakable connection.

In the present embodiment of my invention, the breakable connection comprises a shear pin 8 extending through aligned openings in the member 2 and the two sides of the part of the lever 4 embracing the member 2. One end of the pin 8 is provided with a head 9 engaging one side of the lever 4 and the other end of the pin 8 is provided with a small cotter pin 10 extending through a transverse opening in the pin 8 and engaging the other side of the lever 4 to hold the shear pin 8 in place. The free end of the pin 8 is pointed to permit it to be easily inserted into the openings in the member 2 and lever 4.

The members 2 and 4, held together as de-

scribed, form my improved wrench which may be operated as follows: In tightening a bolt within its elastic limit, the nut-embracing part 3 is applied to the nut of the
 5 bolt in a manner to tighten the bolt if the lever 4 be moved in the direction of the arrow 12 in Fig. 2. Muscular force is then applied to the handle 6 to move the lever 4 in the direction of the arrow 12 until the
 10 bolt has been sufficiently tightened. The strength of the shear pin 8 is such that if sufficient force be applied to the lever 4 to stretch the bolt beyond its elastic limit the pin 8 will be sheared before the bolt has been
 15 so stretched, thereby permitting the hand lever 4 to move on its pivot and saving the elastic properties of the bolt.

When it is desired to loosen a nut on a bolt or to tighten a bolt to any desired extent, the wrench is applied to the nut in a
 20 manner to turn the nut in the desired direction if force be applied to the lever 4 in the direction of the arrow 11, thereby causing the stop 7 to engage the member 2 and preventing the force applied to the lever 4 from
 25 shearing the pin 8.

It will be seen that by turning the wrench to reverse the faces of the lever 4, the position of the stop 7 with relation to the direction in which the lever 4 is to be moved in
 30 tightening a bolt will also be reversed. Therefore, in order to insure the proper application of the wrench to a nut when it is desired that the breakable connection shall
 35 operate to save the bolt from being stretched beyond its elastic limit, I provide the member 2 with a guard 13. This guard 13 extends laterally from the member 2, adjacent the nut-receiving opening therein, a distance equal to the depth of the nut to be
 40 operated upon, and when an attempt is made

to wrongfully apply the wrench the guard 13 will engage the wall of the bolted structure against which the nut is to be screwed and thereby prevent the application of the wrench to the nut until the faces of the lever 4 have been reversed and the parts brought into the position in which the shearing action upon the pin 8 will not be prevented by the stop 7 when force is applied to the lever to tighten the bolt.

I claim:

In a wrench the combination of a member having a nut-embracing part of permanent configuration, a hand operated member, a breakable connection between said members normally causing the first named member to move with the hand-operated member and breaking under a predetermined pressure against the hand operated member when the movement of the first named member is stopped by the resistance of a nut to further turning, said hand-operated member having a stop part arranged adjacent the first named member and causing it to move with the hand-operated member when it is moved in one direction at right angles to the nut-engaging faces of said nut-embracing part, said connection holding the first named member normally adjacent said stop part, and a guard projecting from the nut-embracing part of the first named member to prevent the application of the wrench to a nut in a manner to tighten a nut by pressure of said stop part against the first named member.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. ALDEN.

Witnesses:

J. N. PEREGOY,
 LOUISE PARK.