No. 712,655. Patented Nov. 4, 1902.

C. J. COULTER & N. F. ADAMSON.

WRENCH.

(Application filed July 2, 1902.)

(No Model.) 2 Sheets—Sheet 1.

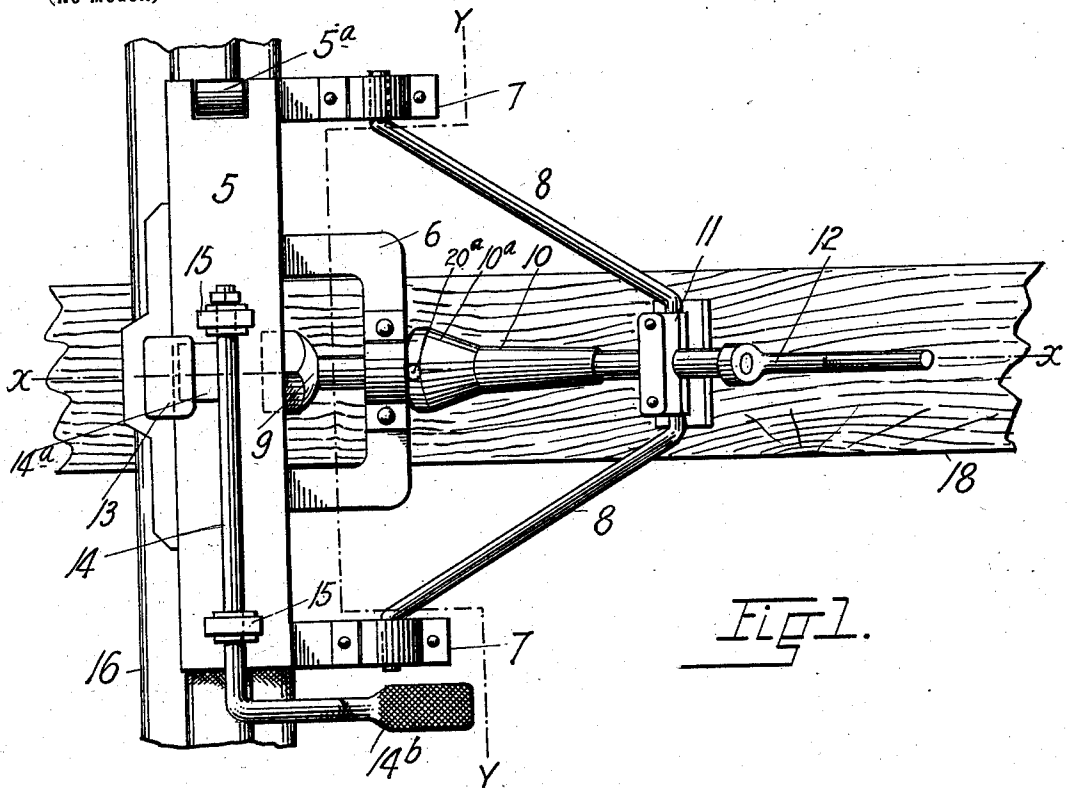
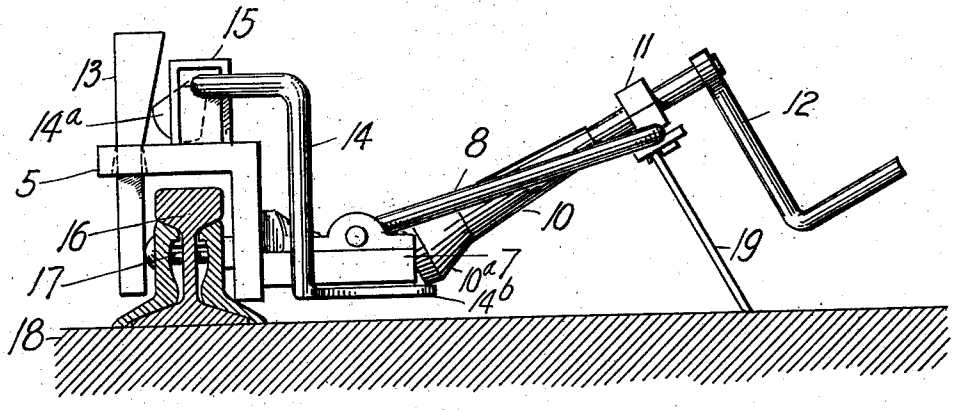


Fig 1.

Fig 2.



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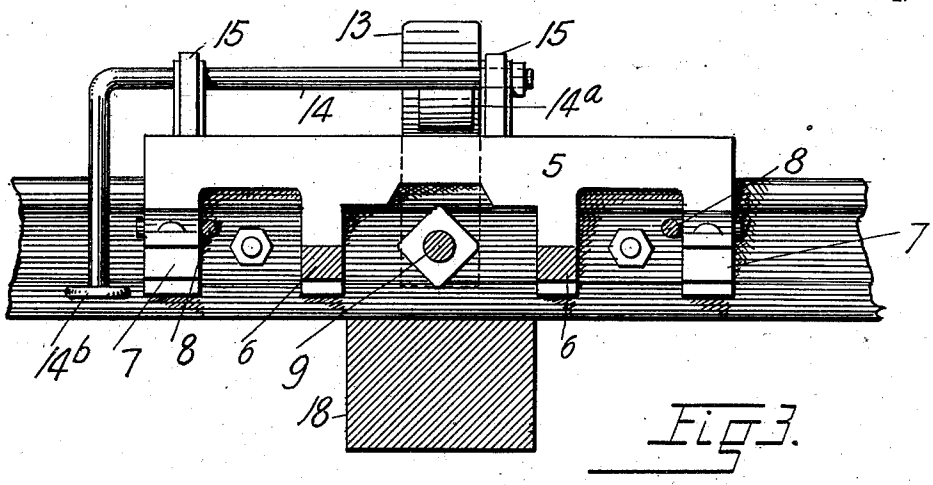


Fig 3.

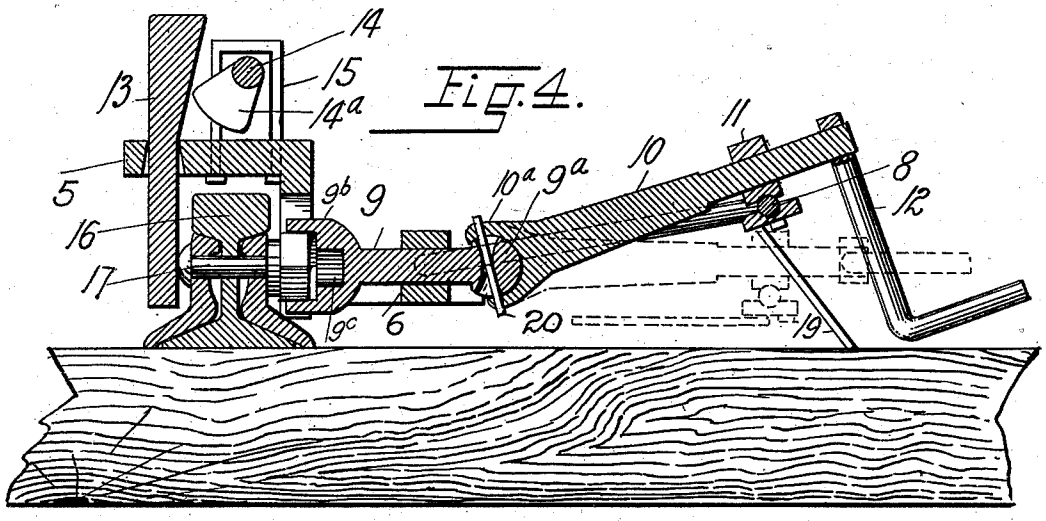


Fig. 4.

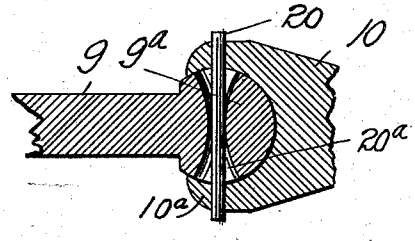


Fig 5.

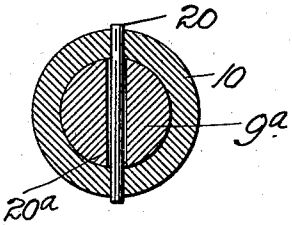


Fig 6.

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UNITED STATES PATENT OFFICE.

CHARLES J. COULTER AND NILS F. ADAMSON, OF DENVER, COLORADO.

WRENCH.

SPECIFICATION forming part of Letters Patent No. 712,655, dated November 4, 1902.

Application filed July 2, 1902. Serial No. 114,098. (No model.)

To all whom it may concern:

Be it known that we, CHARLES J. COULTER and NILS F. ADAMSON, citizens of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Wrenches; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to wrench-machines, and more especially to that class thereof known as "bolt-holding," wherein the nut or the bolt is held by the mechanism while the nut is being applied to or removed from the bolt.

The object of the invention is to improve the details of construction of machines of this character in order to produce one in which bolts can be quickly applied—as, for instance, to railway-rail joints, in connection with which it is illustrated in the accompanying drawings—to which end the invention consists in the details set forth below and more particularly pointed out in the claims appended, all as shown in the accompanying drawings, wherein—

Figure 1 is a plan view, and Fig. 2 an end view, of this machine in use. Fig. 3 is a side view, partly in section. Fig. 4 is a transverse sectional view, and Figs. 5 and 6 are sectional details.

Referring to the drawings, 16 designates the rail, mounted on ties, as usual, and the extremities of the rails are lapped by fish-plates in the well-known manner, and 17 is the customary bolt which passes through said plates and rail ends and receives a nut. The proposition is to apply these nuts to the bolts in a rapid and effectual manner, more so than by hand, which is now the usual practice. We do not, however, limit ourselves to this use of the machine described below, though for purposes of illustration the same is shown and described in connection with a rail-joint.

5 is the body, which is an L-shaped casting of sufficient length to cover all the bolts at an ordinary rail-joint. The top of this body stands above the tread of the rail and may have rollers 5^a, so that it can be moved longitudinally thereon with ease. The upright side of this body is preferably divided into fingers, as best seen in Fig. 3, the two outermost fingers carrying bearings 7 for a yoke 8, described below, and the two innermost fingers carrying a bearing or bearings 6, also for a purpose to appear below.

13 designates an upright clamp passed through an aperture in the top of the body 5. 15 designates bearings rising from said body and in which is mounted a cam-shaft 14, having a handle 14^b at a suitable point and a cam 14^a preferably between said bearings, and this cam when turned by the cam-shaft presses the upper end of the clamp outward and throws its lower end inward, whereby it not only presses against the head of the bolts 17, but also clamps the body upon the rail. The latter, it is understood, may be any member through which it is desired to insert the bolt.

The bearing 6, carried by the innermost fingers of the body, supports a main or driven shaft 9, having at its inner end a cup 9^b, shaped to receive the nut, and at the bottom of said cup is a recess or depression 9^c to receive the threaded end of the bolt when the nut has been screwed thereonto. This shaft stands in axial alinement with the axis of the bolt, being mounted in its bearing 6 at a point to correspond with the height of the bolt and being moved longitudinally, so as to correspond with the linear disposition of the bolt.

10 is the power-shaft, having rotary means, such as a crank-handle 12, at its outer end, and these may be disposed as preferred, so long as they impart rotary movement to the main shaft, but as the latter when employed on railway-rails is rather low we preferably make use of the following mechanism.

In the bearings 7, carried by the outer fingers of the body and on a line through the center of the bearing 6, is pivoted a yoke 8, which in turn carries at its center a single bearing 11, (preferably journaled upon the yoke 8 and supported by a leg 19, as seen in Fig. 4,) and through this bearing is journaled a power-shaft 10, having a crank-handle 12 at its outer end by which it may be turned. The leg 19 usually raises the outer end of this shaft so high that some form of flexible joint is needed between the inner end of the power or driving shaft and the outer end of the

main shaft or driven shaft, and for this purpose we have devised an improved form of ball-and-socket joint, although it is to be understood that any form of flexible joint which will answer may be used at this point without departing from the spirit of our invention.

By special reference to Figs. 5 and 6 of the drawings it will be seen that 10^a designates a socket at the inner end of the power-shaft 10, through which socket passes transversely a pin 20. At the outer end of the driven shaft 9 is a head or ball 9^a, through which is formed a peculiarly-shaped hole 20^a, which is exactly round at the center of its length, where it fits closely around the pin 20, and is slotted at each end in a plane through the axial center of the shaft 9, its walls curving outward from its center toward each end, as best seen in Fig. 5. This permits flexible movement in all directions of one shaft 9 with respect to the other, 10, yet causes the former to be rotated by the revolution of the latter no matter what the angle between the two within prescribed limits.

In use the machine is adjusted over the rail-joint where the bolts are to be applied, the bodies of these bolts having first been inserted through the fish-plates and the rail ends and their nuts applied. The cam 14^a or other locking means is then adjusted, as will be clear, to push the bolt-bodies into place and to lock the machine in position. The yoke 8 is then raised to such a height that the crank 12 may be rotated without bringing the operator's hand into contact with the ground or the ties, and the leg 19 holds it elevated. The main shaft 9 is then slipped forward through its bearing 6 until its cup engages the nut, and thereafter the crank 12 is turned in the proper direction to screw said nut onto the threaded end of the bolt-body, its tip passing into the recess 9^c, as will be clear. The handle 14^b is then manipulated so as to move the cam and loosen the clamp 13, after which the entire body is slid along the rail (on the rollers 5^a, if employed) until the cup comes opposite another nut, when the operation is repeated. It is obvious that the machine may be used for tightening nuts that are simply loose instead of being initially applied and also that by reversal of the movement of the crank 12 the machine may be employed for removing nuts.

We do not desire to be limited to the precise details of construction, nor to the use of all the features herein set forth at one and the same time. It is clear that the rollers might be omitted, other forms of clamp could be employed, as well as other forms of flexible joint or even gearing between the two shafts, and various changes could be made in the details or in the proportions, shapes, or the materials of parts without departing from the spirit of the invention.

What is claimed as new is—

1. In a wrench, the combination with a body adapted to rest on the article to be bolted, rollers therein for supporting it, bearings on said body, a shaft journaled in such bearings and having a handle, a cam on said shaft, and a clamp pivoted to the body and adapted to be operated by the cam to clamp the body to said article; of a main shaft with means for rotating it, a support for said shaft carried by the body, and a cup on the shaft for embracing the nut.

2. In a wrench, the combination with a body of L-shaped cross-section whose top is adapted to lie upon a rail, bearings rising from the body, and a cam-shaft journaled in such bearings and having a cam and an operating device; of a clamp passing loosely through the top of said body with its upper end adapted to be thrown by said cam to press its lower end toward the rail, a main shaft mounted in supports on the body with means for rotating it, and a cup on such shaft for embracing the nut.

3. In a wrench, the combination with devices for clamping the article which is to receive the bolt, and a fixed and a movable bearing carried by such devices; of a shaft mounted for rotation and longitudinal movement in such fixed bearing, a nut-receiving cup at the inner end of said shaft and having a recess for the tip of the bolt, and means mounted in the movable bearing for operating the shaft.

4. In a wrench of the character described, the combination with an L-shaped body whose top is adapted to engage the tread of a rail and whose side has fingers with intervening spaces exposing the nuts at a rail-joint, a clamp carried by said body and adapted to press the bolt-body into place, and means on the top of the body for operating said clamp; of a bearing carried by certain of said fingers, a driven shaft mounted therein and having a nut-receiving cup, a second bearing supported from certain other fingers, a power-shaft mounted in this bearing, and a connection between the two shafts.

5. In a wrench of the character described, the combination with a body having fingers with intervening spaces exposing the nuts at a rail-joint, and means for clamping the body in place; of a bearing carried by the innermost fingers, a driven shaft mounted therein and having a nut-receiving cup, a second bearing supported from the outermost fingers, a power-shaft mounted in this bearing, means for sustaining the latter bearing at various heights for the purpose set forth, and a flexible connection between the two shafts.

6. In a wrench of the character described, the combination with a body, and means for clamping it to a rail; of two bearings supported by the body, one in line with the axis of a bolt and the other at an angle to such axis, means for supporting the last-mentioned bearing movably so as to permit the varying of such angle, shafts mounted for rotary and longitudinal movements in both these bearings, a flexible connection between their meet-

ing ends, a nut-receiving cup at the end of the inner shaft, and a power device on the outer shaft.

7. In a wrench of the character described, the combination with two bearings, and pivotal connections between them permitting the raising and lowering of the outer bearing in an arc around and in the vertical plane of the inner bearing while the axis of the latter stands horizontal; of shafts mounted for rotary and longitudinal movements in both these bearings, a flexible connection between their meeting ends, a nut-receiving cup at the end of one shaft, and a power device on the other shaft.

8. In a wrench of the character described, the combination with a body, a bearing rigidly carried thereby, a yoke pivoted to the body and encompassing said bearing, a second bearing pivoted to such yoke in the upright plane of the first, and a leg for supporting the pivoted bearing; of shafts mounted for rotary and longitudinal movements in said bearings, a flexible connection between them, a nut-receiving cup on one shaft, and a power device on the other.

9. In a wrench of the character described, the combination with the body, means for clamping it to a rail, a yoke pivoted to said body, a bearing carried by the yoke, and a leg for supporting such bearing at the desired height; of a power-shaft mounted in the bearing for rotary and longitudinal movements, a driven shaft with a nut-receiving cup at its inner end, and a flexible connection between the meeting ends of the shafts.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES J. COULTER.
NILS F. ADAMSON.

Witnesses:
CHAS. H. CHASE,
HENRY C. HAMILL.