J. P. McBRIDE.

BOLTING UP AND PLATE TIGHTENING MACHINE.

APPLICATION FILED NOV. 26, 1918.

1,387,895.

Patented Aug. 16, 1921.

2 SHEETS—SHEET 1.

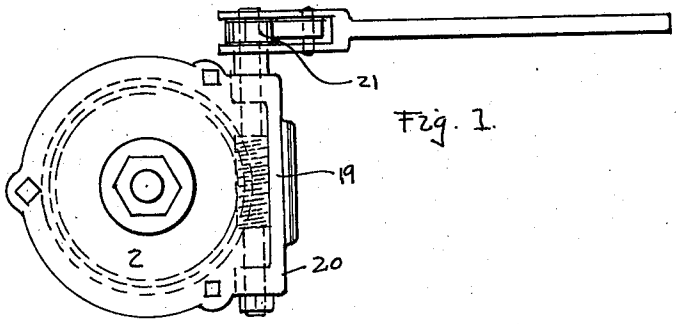


Fig. 1.

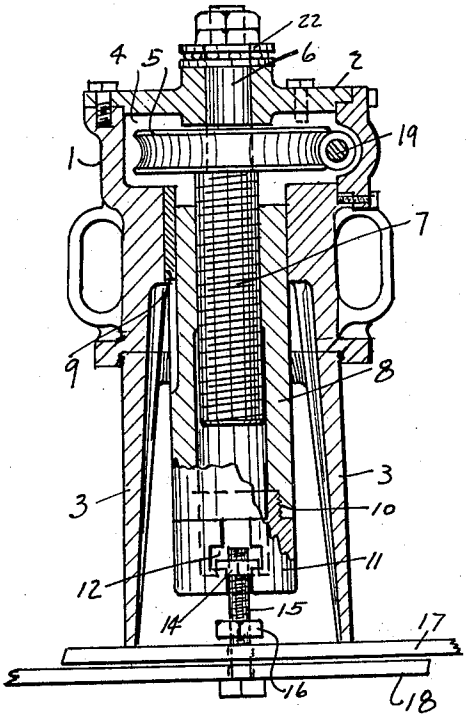


Fig. 3.

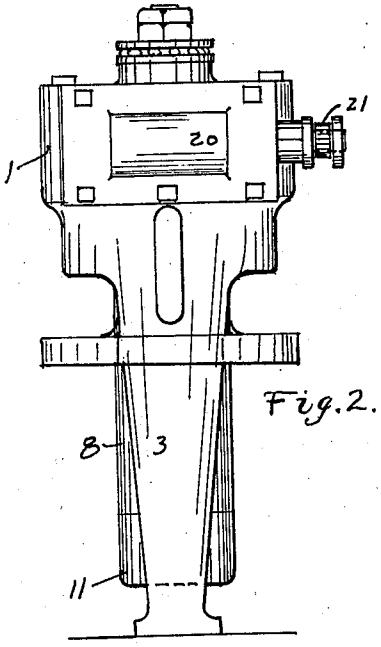


Fig. 2.

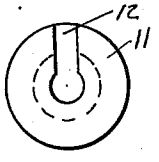
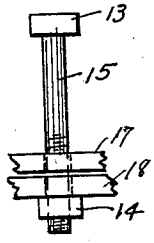


Fig. 5



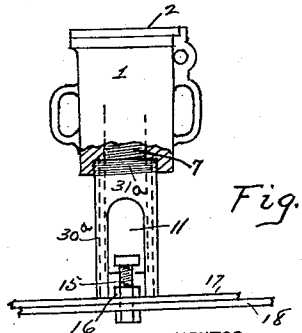


Fig. 8.

Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 6.

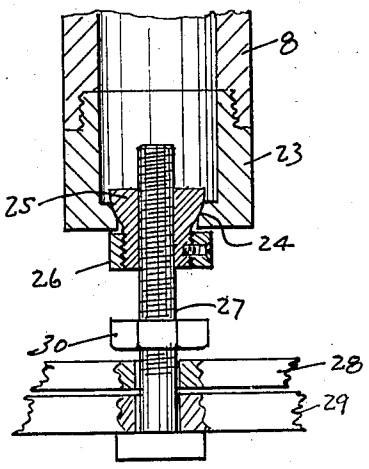
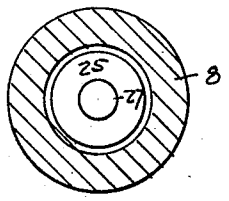


Fig. 7.



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BOLTING-UP AND PLATE-TIGHTENING MACHINE.

1,387,895. Specification of Letters Patent. Patented Aug. 16, 1921.

Application filed November 26, 1918. Serial No. 264,448.

To all whom it may concern:

Be it known that I, JAMES P. McBRIDE, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Improvement in Bolting-Up and Plate-Tightening Machines, of which the following is a specification.

This invention relates to improvements in bolting-up and plate-tightening machines, and has for its principal object to provide an improved and novel device of the class described, and to improve upon my previous United States application, filed August 14, 1918, Serial No. 249,920, in that a simpler and cheaper construction, and a device which is more easily operated by unskilled labor, is provided as herein described.

Another object of my device is to provide simple, adjustable and removable insert chucks for engaging the threaded end of a bolt, or the nut on a bolt, as the case may be.

Still another object of my device is to provide ratchet means for turning a nut on the bolt while the bolt is held in a tightened position.

Other objects will be apparent as my device is more minutely described in the following specification, the appended claims and attached drawings.

In the drawings, Figure 1 is a plan view of my device; Fig. 2 is a side elevation of the same; Fig. 3 is a central vertical section through the device, showing it engaging a pair of plates; Fig. 4 illustrates a bolt engaging a pair of plates with the head in position to engage the chuck of my device; Fig. 5 is a bottom plan view of a nut engaging chuck; and Fig. 6 illustrates a modified form of chuck for engaging the threaded end of a bolt; Fig. 7 is a bottom plan view of Fig. 6, and Fig. 8 is a modified form of Fig. 2.

Referring more particularly to the drawings, Figs. 1 to 7 inclusive, the numeral 1 indicates a housing which is provided with a cover 2 upon its upper end, and projecting legs 3 on its lower end. The housing 1 is cored out, as at 4, to receive a worm wheel 5. The worm wheel 5 is secured to a shaft 6, which takes bearing in the cover 2, and the lower portion of which is threaded, as at 7, and engages an internally threaded cylinder 8. The cylinder 8 is slidably mounted within an opening in the lower portion of housing 1 and is provided with a feather key 9, which prevents its rotation with respect to the said housing. The lower end of cylinder 8 is recessed and threaded, as at 10, to receive a similarly threaded chuck 11. Chuck 11 is hollow and is provided with a cross shaped opening 12 in its side. The head 13 or nut 14 of a bolt 15 is adapted to pass through the wider portion of the opening 12 while the stem of the bolt passes through the narrower portion, thus permitting the nut and bolt to be engaged centrally with respect to the chuck 11 and at the same time to be easily disengaged from the chuck.

In Fig. 1 the bolt 15 is provided with a second nut 16, which is below the nut 14, and which is adapted to be screwed down tightly against a plate 17 after the device has pulled plate 17 against a plate 18, through both of which the bolt 15 passes.

A worm 19 engages the worm wheel 5 and takes bearing in a cap 20, which is held to the housing 1 by means of bolts. The shaft of worm 19 extends beyond the cover 20 and is provided with a ratchet handle 21. The handle 21 is used to rotate the worm, which in turn rotates the worm wheel and consequently the stem 6. The rotation of the stem 6 raises the cylinder 8 with respect to the housing 1, while the lower end of the legs 3 bear against the plate 17. It will thus be seen that when the bolt is gripped by the chuck that the raising of the cylinder 8 will draw the plate 18 tightly against the plate 17 and permit of the nut 16 being screwed down against plate 17. The object of holding the plates tightly together is for the purpose of riveting, as in ship construction and the like.

The upper end of stem 6 is provided with ball bearings 22, which acts as a thrust collar to reduce the friction.

Referring more particularly to Figs. 6 and 7, the cyclinder 8 is provided with a chuck 23, which has a cone shaped bearing 24 at its lower end. An internally threaded nut 25 has a ball shaped bearing which engages the bearing 24, thus permitting accurate alinement of the nut with respect to the cylinder. A collar 26 prevents the nut from becoming disengaged from the chuck.

In this construction of the device the nut 25 engages the threaded end of a bolt 27

and thus pulls directly upon the bolt which has previously been passed through plates 28 and 29. An ordinary nut 30 which is screwed on to the bolt intermediate the plates and the nut 25 is set down tightly against the plate 28 after the device has pulled the plates solidly together. The difference in the construction of the chuck in Figs. 6 and 3 lies in the fact that the former engages the threaded end of the bolt direct while the latter engages the nut upon the bolt.

Referring particularly to Fig. 8, which illustrates a modification of Fig. 2 in that the legs 3 may be removed below the line of separation, as shown in Fig. 2, and a pipe leg 30^a screwed into the lower end of the housing 1. This feature of the device is particularly applicable where the space is somewhat limited and it is desired to bear evenly against the plate 17 all around the circumference of the bolt and nut. In ship work the pipe leg is particularly applicable for use on curved or rounded surfaces, such as the bilge strake, etc., where is would be difficult to bring the angular legs to a satisfactory bearing. The legs as shown in Fig. 2 are screwed into the lower end of the housing 1 and are easily removable. It will be noted that the pipe leg 30^a is cut away to permit of its being easily set over the nut and that it is threaded, as at 31^a, to engage the lower end of the housing 1.

It will be understood that while I have shown a nut and screw mechanism for moving the cylinder 8 longitudinally of the housing it will be obvious that other means could be employed for moving an element the equivalent of the cylinder 8 longitudinally of the housing, such as a fluid operated piston as shown in my application Serial Number 249,920 of which the present application is a continuation in part. Under such conditions the essence of my invention would still remain in the provision of means associated with the member, which is movable longitudinally of the housing, engageable through perforations of the plates and with the plate remote from the housing whereby sliding of the member in one direction will exert a pulling force against the plate remote from the housing while reacting through the housing against the other plate to clamp said plates together.

What I claim, and desire to protect by Letters Patent, is:

1. In a portable tool for clamping together a pair of perforated plates, a housing, and a nut and screw mechanism carried by said housing including means engageable through perforations of the plates and with the plate remote from the housing, and operable to clamp the plates together.

2. In a portable tool for clamping together a pair of perforated plates, a housing, a member slidable in the housing, a rotatable element mounted in the housing and operatively connected with the member to effect sliding movement of the latter, means for rotating the element, and means associated with the member engageable through perforations of the plates and with the plate remote from the housing operable by sliding movement of the member to clamp the plates together.

3. In a portable tool for clamping together a pair of perforated plates, a housing, a member slidable in the housing, a rotatable element mounted in the housing, a screw connection between the element and member whereby rotation of the element will slide the member, means for rotating the element, and means associated with the member engageable through perforations of the plates and with the plate remote from the housing operable by sliding movement of the member to clamp the plates together.

4. In a device of the class described, the combination of a housing, an internally threaded member slidably mounted within the housing, a threaded stem engaging the internal threads of the member, means for rotating said stem to move the member longitudinally with respect to the housing, and means on said member for engaging a bolt whereby the bolt may be drawn toward the housing.

5. In a device of the class described a combination of an internally cored housing, legs extending outwardly from the said housing and adapted to engage the surface of a plate, an internally threaded cylinder slidably mounted within the said housing, means for moving the cylinder longitudinally with respect to the said housing, means upon the lower end of the said cylinder for engaging a bolt, whereby the bolt may be drawn toward the said housing.

6. In a device of the class described a combination of an internally cored housing, legs extending outwardly from the said housing and adapted to engage the surface of a plate, an internally threaded cylinder slidably mounted within the said housing, a threaded stem engaging coöperating threads within the said cylinder and supported at its upper end by the said housing, a worm wheel secured to the said stem, a worm engaging the said worm wheel and mounted within the said housing, whereby when the worm is rotated longitudinal motion is transmitted to the said cylinder, and means on said cylinder for engaging a bolt whereby the bolt may be drawn toward the housing.

7. In a device of the class described a combination of an internally cored housing, legs extending outwardly from the said housing and adapted to engage the surface of a plate, an internally threaded cylinder slidably mounted within the said housing,

a threaded stem engaging coöperating threads within the said cylinder and supported at its upper end by the said housing, a worm wheel secured to the said stem, a worm engaging the said worm wheel and mounted within the said housing, whereby when the worm is rotated longitudinal motion is transmitted to the said cylinder, chuck means removably secured to the lower end of the said cylinder, said chuck means including a hollowed radially slotted member, whereby a bolt and nut may be engaged laterally.

8. In a device of the class described a combination of an internally cored housing, legs extending outwardly from the said housing and adapted to engage the surface of a plate, an internally threaded cylinder slidably mounted within the said housing, a threaded stem engaging coöperating threads within the said cylinder and supported at its upper end by the said housing, a worm wheel secured to the said stem, a worm engaging the said worm wheel and mounted within the said housing, whereby when the worm is rotated longitudinal motion is transmitted to the said cylinder, chuck means removably secured to the lower end of said cylinder, said chuck means including a hollowed member having spherical socket bearing, a spherical nut engaging the said bearing and internally threaded, whereby the threaded stem of a bolt may be engaged.

9. In a portable tool for clamping together a pair of overlying perforated plates, a housing, a member slidable in the housing and extending through one end thereof, means for sliding the member with respect to the housing, and means associated with the member engageable through perforations of the plates and with the plate remote from the housing whereby sliding of the member in one direction will exert a pulling force against the plate remote from the housing which reacts through the housing against the other plate to clamp said plates together.

Signed by me at Seattle, Washington, this 16th day of November, 1918.

JAMES P. McBRIDE.

Witnesses:

FRANK H. FOWLER,

D. E. KUHNS.