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F. C. HACHENEY

ADJUSTABLE WRENCH

Filed May 15, 1922

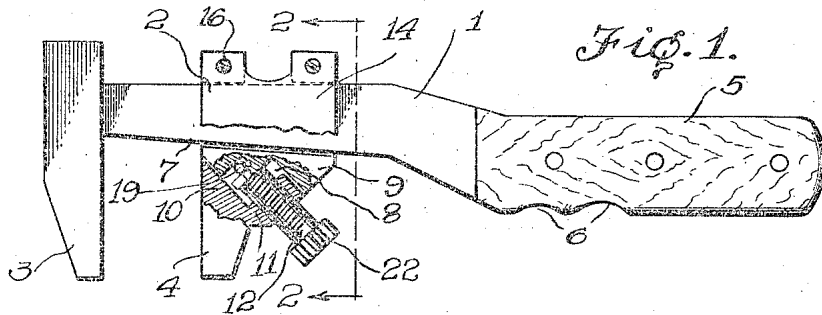


Fig. 1.

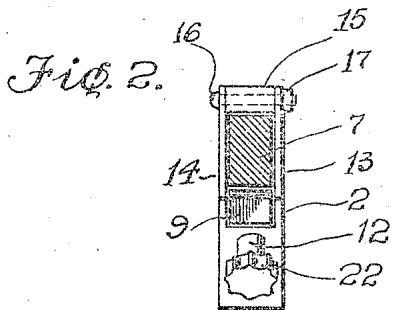


Fig. 2.

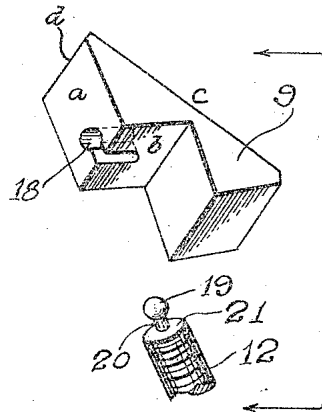


Fig. 3.

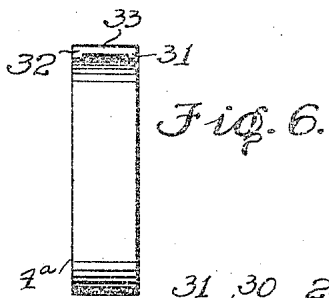
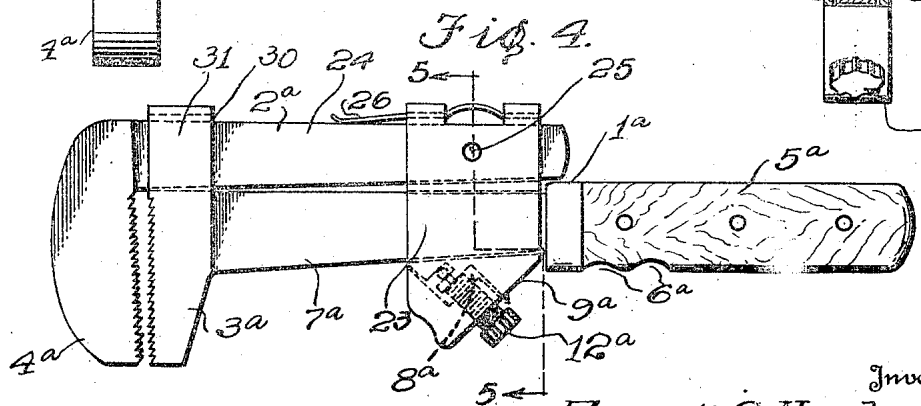
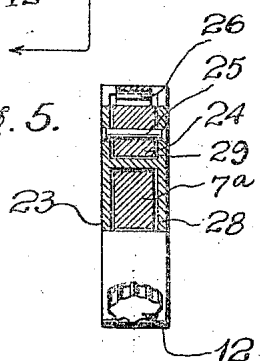


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK C. HACHENEY, OF JOHN DAY, OREGON.

ADJUSTABLE WRENCH.

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To all whom it may concern:

Be it known that I, FRANK C. HACHENEY, a citizen of the United States, residing at John Day, in the county of Grant and State of Oregon, have invented certain new and useful Improvements in Adjustable Wrenches.

My invention relates to wrenches having a slidable jaw and has for its main object the provision of means designed to obviate certain disadvantages heretofore existing in wrenches of this type.

In previous designs of wrenches of this type, attempts have been made to provide means for securing the sliding jaw fixedly in place but such attempts have not been entirely successful and great difficulty has been experienced in providing a securing means that would maintain the jaws of the wrench in the proper relative position, but, on the other hand, it has been found that the jaws would not remain in a fixed position and, under stress, would move. Such movement of the jaws, besides necessitating readjustment, results in the wearing away and destruction of the bolt heads and nuts, especially those of the hexagonal type.

My invention is designed to overcome such defects and this object is brought about by providing the wrench with a shank which is tapered and, cooperating with this tapered shank, a tapered key, the taper of the shank and the cooperating key being substantially in the same direction. In this way, the greater the stress, the greater is the resistance offered to relative movement in a direction opposite the direction of the stress.

Another object of my invention is to provide a new and improved pipe wrench having all of the above desirable features and other advantages that will be hereinafter pointed out.

For a complete understanding of the invention, reference is to be had to the following description and the accompanying drawings in which:

Figure 1 is a view in elevation of a well known type of wrench, partly broken away and partly in section.

Figure 2 is a sectional view on the line 2—2 of Figure 1.

Figure 3 is an enlarged perspective view of the locking key and the adjusting screw associated therewith.

Figure 4 is a view in elevation of my novel pipe wrench.

Figure 5 is a sectional view thereof on the line 5—5 of Figure 4.

Figure 6 is an end elevation seen from the end having the jaws.

Referring to Figure 1 of the drawings, the reference character 1 designates the stationary member and 2 designates the slidable member, said members being provided with the work engaging portions or jaws 3 and 4, respectively. The wrench is provided with a suitable handle 5 having the grooves 6 to permit a good grip of the wrench by the workman. As clearly shown, the stationary member 1 has a tapered shank portion 7.

The slidable member 2 has an angular recess 8, which receives the tapered locking key 9, the tapered end *d* of this locking key being formed by the intersection of the converging faces *a* and *c*. This recess has a side wall 10, inclined preferably at an angle of 45 degrees to the face of the jaw 4, and a lug portion 11 at right angles to the inclined side wall 10, said lug 11 being screw threaded to receive the screw 12 that cooperates with the key 9 and serves as an adjusting means therefor. Screw 12 is parallel to the wall 10 and diagonal to the long axis of the shank, preferably at an angle of 45 degrees thereto. Thus it will be readily seen that by manipulating the screw 12 the locking key 9 may be moved in a direction at right angles as well as parallel to the tapered shank, giving a wider range of adjustability than can be had in the old way of placing the screw. The member 2 has the upstanding sides 13 and 14. The sides 13 and 14 are held in proper relation by the spacer 15 secured to the sides 13 and 14 by bolts 16 having nuts 17.

As before stated, the tapered locking key 9 is received into the recess 8 of the slidable member 2. Figure 3 clearly shows the construction of the locking key and it will be seen that this key comprises a substantially right angled member having a square cut out portion resulting in the construction shown having the surfaces *a* and *b* which are at right angles to each other and the surfaces of the side wall 10 and the lug 11, respectively, and also the flat surface *c* one edge of which is shown in the drawings. The surface *c* cooperates with the shank 7 to hold the sliding member 2 securely in a fixed position. It is important to note that the key 9 and the shank 7 taper in substantially the same direction and consequently any force

acting on the face of the jaw 4 is met by increased resistance that would not be afforded by mere frictional contact even though augmented by clamping action. As the movable jaw 4 is moved to adjust the wrench to different sized work, the wedge shaped key 9 is moved in or out of the recess 8, as the case might be, by means of the screw 12 to compensate for the change in width of the tapered shank, and by means of this construction the face of the jaw 4 is always held in a position parallel to the face of the jaw 3. An inspection of Figure 1 will clearly show the coaction between the shank 7 and the key 9 whereby increased resistance is offered to increased stress.

The key 9 has a key slot opening 18 which receives the ball point 19 and spindle like portion 20 of the adjusting screw 12. An important feature of this invention resides in making the screw 12 of a diameter almost equal to a side of the surface *b* of the locking key 9 so that there may be provided on the shoulder 21 as large a bearing surface as possible. It is obvious that the shoulder 21 supports the key 9 in position in the recess 8 and that the spindle and ball connection with the key merely serves as a retracting means. The screw is provided with a thumb head 22 so that the screw may be readily turned by hand.

The method of manipulating the wrench will be obvious from the above description. To adjust the wrench, it is necessary only to retract the key 9 and place the member 2 in the desired position and then to move the key 9 by the screw 12 in coacting relation with the tapered shank 7. After the key 9 is set into place against the shank, the jaws 3 and 4 will maintain their relative position and will withstand much more than ordinary wrench turning stresses. A solid and "hold tight" adjustment is provided and lost motion between the members is eliminated. The wrench when once adjusted may be laid down and be picked up and applied to the work without further adjustment and such constant relation between the jaws and the effectiveness of the jaws in resisting the wrench turning stresses and by reason of the firm grip so provided between the jaws and bolt heads or nuts, such bolt heads and nuts, especially those of hexagonal shape, are not deleteriously affected in any way, but, on the other hand, the rounding of the corners of such nuts and bolt heads is prevented.

In Figure 4 there is shown my novel pipe wrench comprising the stationary and slidable members represented generally by the reference characters 1^a and 2^a, respectively, provided with the working engaging portions 3^a and 4^a, the member 1^a having a suitable handle 5^a having the grooves 6^a. The stationary member 1^a has the tapered shank

7^a. Cooperating with this tapered shank is the locking key 9^a having the adjusting screw 12^a, the construction of which is the same as the key 9, except it is correspondingly tapered to coact with the tapering of the shank 7^a, which, it will be noticed, is in an opposition direction to the tapering of the shank 7 of the wrench shown by Figure 1. This key 9^a is received in a recess 8^a in the housing 23 which constitutes a part of the member 2^a being connected to the tapered shank 24 which passes therethrough and is pivotally connected therewith by the pin 25. A spring 26 is seated in the top part of the housing 23 and bears on the top surface of the shank 24 of the slidable member 2^a. It will be seen that the housing 23 is a solid piece of metal having the openings 28 and 29 through which pass the shanks 7^a and 24, respectively, and the recess 8^a which is a continuation of the opening 28 and receives the locking key 9^a. The stationary member 1^a has integral therewith the housing 30 which comprises the upstanding projections 31 and 32 and the top part 33 all in a single piece integral with the jaw 3^a and thus provide an opening through which passes the shank 24. The jaws 3^a and 4^a are provided with toothed surfaces, as shown, in order that the work may be readily and securely gripped therebetween.

The manipulation of the wrench is the same as the wrench shown by Figure 1 and needs no detailed description. It will be apparent that the members 1^a and 2^a are at all times held in proper relative position by the locking key 9^a. The opening in the housing 30 is slightly larger than the widest portion of the shank 24 and permits of relative vertical movement of the jaws 3^a and 4^a so that the wrench may be readily removed from the work, as is manifest from the drawing. The provision of extra metal near the jaw 3^a due to the tapered form of the shank, materially strengthens the wrench and increases its life considerably.

While I have shown and described the preferred embodiment of my invention, it will be understood that certain changes may be made without departing from the invention and I do not wish to be limited to the description and illustration except within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. A wrench comprising a stationary member and a slidable member having a recess therein, said stationary member having a tapered shank, said recess having two walls at right angles to each other, a tapered locking key received into said recess and cooperating with said tapered shank to hold said stationary and slidable members in fixed relation, said tapered key hav-

ing two faces at right angles to each other and cooperating with said walls of the recess to properly position said locking key in said recess, and a screw cooperating with said locking key, said screw being diagonally disposed to the long axis of the said tapered shank.

2. A wrench comprising a stationary member and a slidable member, said stationary member having a tapered shank, said slidable member having a recess therein, said recess having two walls at right angle to each other, a tapered locking key in said recess, said locking key having two faces at right angles to each other and a face cooperating with the tapered shank, one of the faces of the key being in sliding contact with one of the walls of the recess, and a screw passing through the other wall of the recess and bearing on the other face of the key to hold said key in position in said recess.

3. A wrench comprising a stationary member and a slidable member, each of said members having a shank and a jaw, the shank of said stationary member being tapered, a housing integral with the stationary member and having slidably disposed therein the shank of the slidable member, a housing pivotally connected to the shank of the slidable member and having slidably disposed therein the shank of the stationary member, a tapered locking key in said last mentioned housing, and a screw diagonally disposed to the long axis of the tapered shank cooperating with said locking key for adjusting the slidable member to position.

4. A wrench comprising a stationary member and a slidable member, each of said members having a jaw and a tapered shank, a housing associated with each of said mem-

bers and acting as a guide for the shank of the other member, a tapered locking key in the housing of the slidable member and cooperating with the shank of the stationary member to hold said members in fixed adjusted relation, and a screw cooperating with said locking key, said screw being diagonally disposed to the long axis of the said tapered shank.

5. A wrench comprising a stationary member and a slidable member, each of said members having a jaw and a shank tapered from the jaw, a housing associated with each of said members and acting as a guide for the shank of the other member, a spring tending to hold said shanks in sliding contact, and means to hold said members in adjusted relation, said means comprising a tapered key and a screw cooperating therewith, said screw being diagonally disposed to the long axis of the stationary member.

6. A wrench comprising a stationary member and a slidable member, said slidable member having a recess therein and screw threads in one wall thereof, said stationary member having a tapered shank, said recess having two walls at right angles to each other and a third wall parallel to one of the other two, a tapered locking key received into said recess having two faces at right angles to cooperate with the aforesaid faces at right angles of the recess and having a third face parallel to one of the other two, a screw passed through said threads diagonally disposed to the long axis of the said stationary member and slidably connected to the said tapered key, whereby the key is adjusted to locking position by sliding over the aforesaid parallel walls of the recess.

In testimony whereof, I have hereunto signed my name to the specification.

FRANK C. HACHENEY.