Aug. 20, 1935. C. L. ERICKSON ET AL 2,011,622

TOOL

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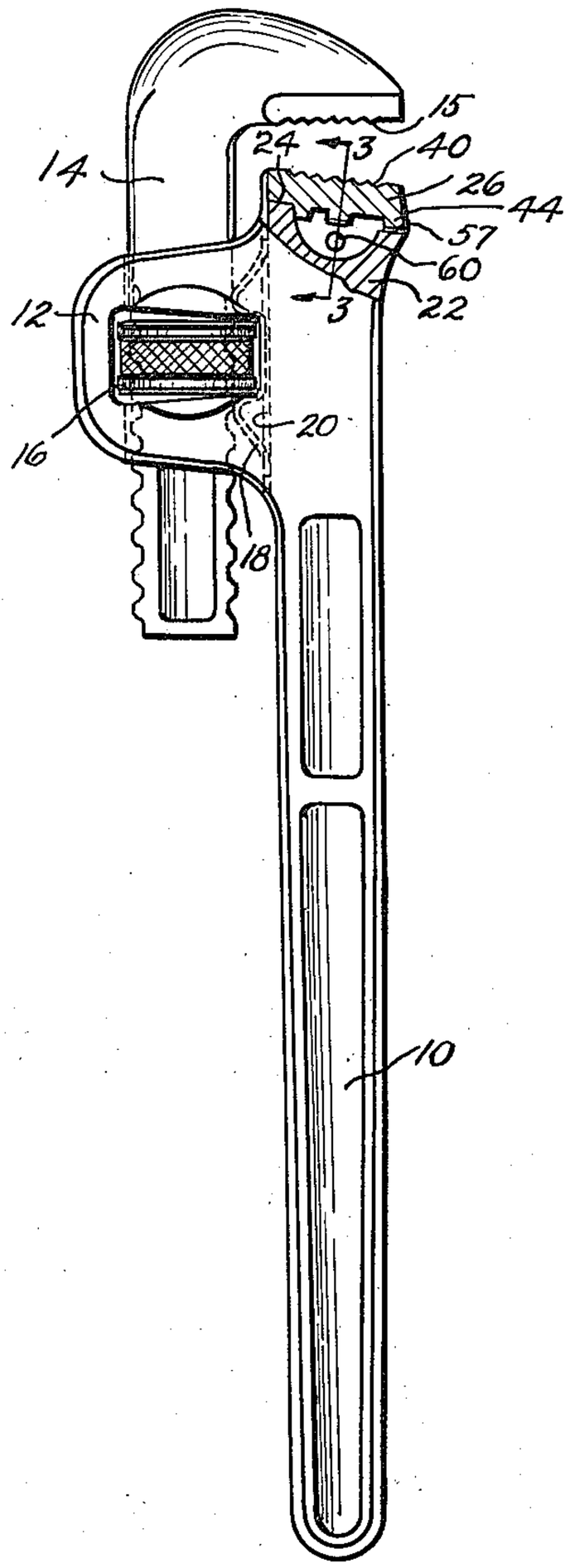

Fig. 1.

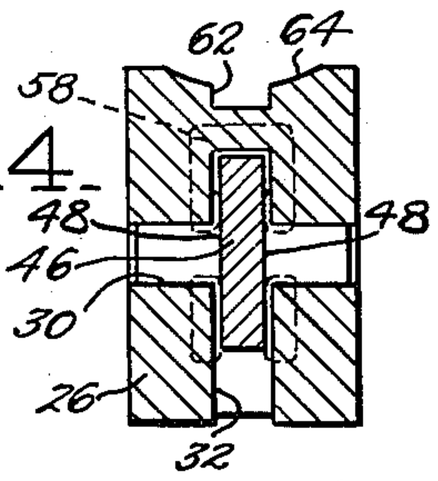

Fig. 4.

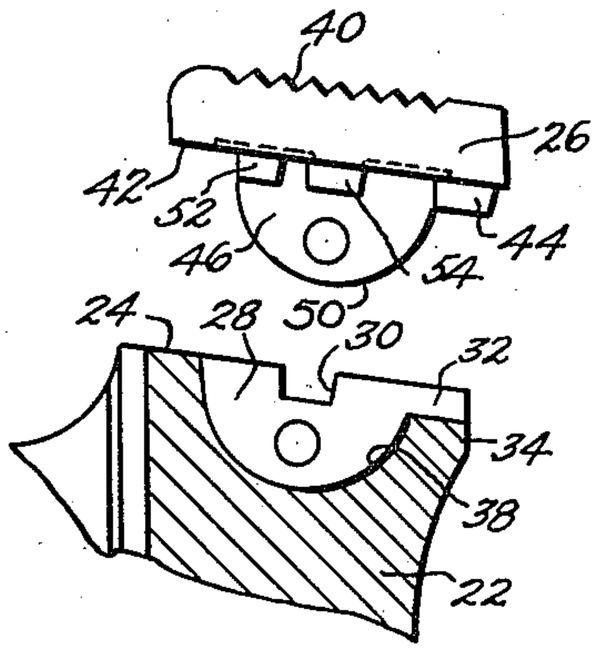

Fig. 2.

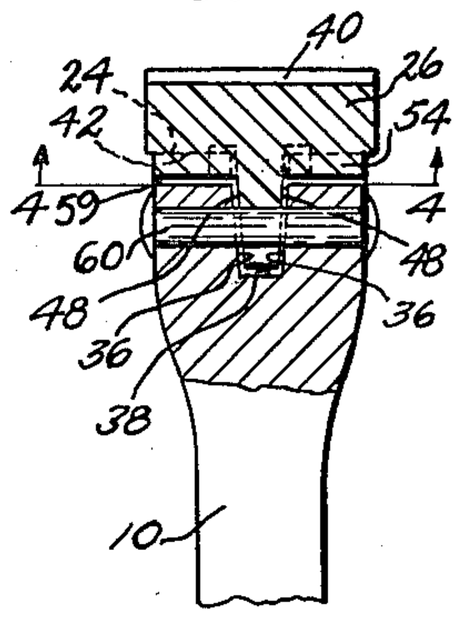

Fig. 3.

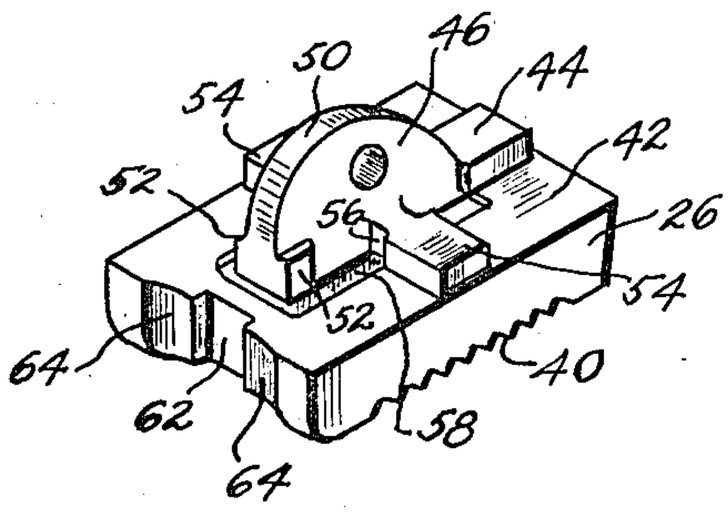

Fig. 5.

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TOOL

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Application July 8, 1933, Serial No. 679,540

4 Claims. (Cl. 81—180)

This invention relates to gripping tools, such as wrenches, vises and the like and more particularly to improvements in removable jaw faces therefor.

Gripping tools of the class described are often provided with one or more detachable jaw faces in which the gripping teeth are formed, so that when the teeth become worn or broken the jaw face can be discarded and a new one inserted in the tool. The usual means of retaining the jaw face in the tool is by means of a rivet or pin which is inserted through both the jaw face and the supporting portion of the tool upon which the jaw face is seated.

The jaw faces of these gripping tools are required to withstand considerable thrust during the use of the tool, which in the case of wrenches and like tools subjected to a turning force, tends to displace the jaw face from its seat. It will be apparent that if this thrust is taken solely by the retaining pin the life of this member will be short. This is a common source of failure in tools of this description and is the cause of much annoyance and expense to those concerned.

An object of this invention is to relieve the jaw face holding pin from strain.

Another object of this invention is to carry the load placed upon the jaw face upon means which will be strong enough to withstand it.

Another object of the invention is to prevent unauthorized movement of the jaw face on its seat.

Another object of the invention is to insure ready removal of the jaw face when desired.

Another object of the invention is to form the jaw face in one piece which can readily and inexpensively be manufactured.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is a front elevation of a pipe wrench showing the stationary jaw portion partly in section with the improved jaw face in position.

Fig. 2 is an enlarged fragmentary front elevation partly in section of the stationary jaw shown in Fig. 1 with the jaw face separated therefrom.

Fig. 3 is a section taken on the line 3—3 of Fig. 1 looking in the direction indicated by the arrows.

Fig. 4 is a section taken on the line 4—4 of Fig. 3 looking in the direction indicated by the arrows and

Fig. 5 is a perspective view of the jaw face.

Although this invention is shown and will be described in connection with a pipe wrench it will be understood that this is merely for the purpose of illustration and that the invention is not limited to tools of this class but may be applied with equal facility to other types of wrenches, vises and the like with or without minor changes in construction falling within the scope of appended claims.

Referring more particularly to the drawing, the pipe wrench shown as a whole in Fig. 1 is of the well known "Walco" type constructed in accordance with the teachings of Brungardt Patent No. 1,862,002. Accordingly, the wrench is provided with a bar portion 10 having an integral frame 12 for the reception of a movable jaw 14. The movable jaw 14 may be adjusted relatively to the bar 10 by means of a nut 16 and is positioned within the frame 12 by means of a spring 18 which in the gripping position of the movable jaw is adapted to be housed within a slot 20 formed along the inner side of the bar 10. The usual teeth 15 are formed in the movable jaw 14 as shown.

The bar 10 is further provided with a stationary jaw 22 which in the aforementioned Brungardt patent had gripping teeth formed directly therein. However, as this present invention contemplates the provision of a detachable jaw face for the stationary jaw 22, these gripping teeth are not formed directly in the bar but the end surface of the jaw 22 is provided with a flat seat 24. In order to retain the conventional angle between the stationary and movable jaws the seat 24 is inclined with reference to the length of the bar as shown in Fig. 1. On the flat seat thus formed is seated the detachable jaw face designated by the numeral 26.

In accordance with this invention means are provided to support the detachable jaw face 26 against displacement under load and to relieve from strain the means holding said jaw face in position. To this end, seat 24 is provided with a cruciform recess comprising a slot 30 extending across the width of the seat 24 and a slot 32 extending from the outer edge 34 of the jaw 22 partly across the length of the seat 24. The slot 32 is interrupted by a recessed portion 28 having in this instance, flat sides 36 converging toward and bounded by a concave bottom surface 38, which extends into the seat 24 adjacent the inner side of the bar as shown clearly in Fig. 2. It will be apparent that the slots 30 and 32 form the arms of the cruciform recess and that the arm formed by the slot 32 is deeper

for a portion of its length by reason of the recess 28 than the arm formed by the slot 30.

The detachable jaw face 26 is preferably formed from a single piece of material and has on one face thereof suitable teeth 40 adapted to cooperate with the teeth 15 on the movable jaw, in gripping pipe or other objects. The opposite face is formed with a flat seating surface 42 for engagement with the seat 24. Extending from the surface 42 is a cruciform projecting portion comprising an arm 44 extending partly across the length of the face 42 and having a projecting portion 46 therein. This projecting portion 46 is preferably of less width than the arm 44 and has flat sides 48 converging toward and bounded by a convex bottom surface 50. As shown in Fig. 5 the arm 44 extends beyond the projecting portion 46 at one end while forming pads 52 on each side thereof at the other end.

Extending transversely of the arm 44 is the other arm 54 of the cruciform portion, this latter arm extending across the width of the jaw face on each side of the projecting portion 46. If desired, the inner portions of the arm 54 adjacent the projecting portion 46 may be reduced to form a neck 56, thus providing a clearance to insure seating of the jaw face and, furthermore, a depression 58 may be formed in the face 42 around the projecting portion 46 for a similar purpose. Preferably, the arms 44 and 54 are of less depth than the slots 32 and 30, as shown, to insure that when the jaw face 26 is assembled on the stationary jaw 22 the surface 42 of the jaw face will engage the seat 24 while a clearance 57 is formed between the arm 44 and bottom of slot 32 (Fig. 1) and a clearance 59 is formed between the arm 54 and the bottom of slot 30 (Fig. 3). The cruciform projecting portion of the jaw face when assembled in the tool enters the cruciform recess in the seat 24. The pads 52 closely engage the upper portion of the recess 28 while the related arm 44 closely fits the slot 32. The transverse arm 54 closely engages the slot 30 while the converging sides 48 of the projection 46 are spaced from the sides 36 of the recess 28.

In order to retain the jaw face in position both the stationary jaw 22 of the wrench and the projecting portion 46 of the jaw face may be perforated for reception of a pin 60 which is preferably made a tight fit and headed over at each end as shown in Fig. 3. In this manner the jaw face is held against unauthorized displacement from its seat at any time while being unable to tilt or shift under load by reason of the cruciform portion closely engaging the cruciform recess in the seat as described.

In order to accommodate the end of the spring 18 when it is housed within the slot 20, a continuation 62 of this slot may be formed in the jaw face 26. The jaw face may also be cut away as at 64 to provide clearance for the movable jaw when positioned against the bar 10 in the gripping position.

During use of the wrench a considerable thrust will be placed upon the detachable jaw face 26 but it will be apparent that none of this thrust is taken by the pin 60. The entire thrust on the jaw face is carried by the interengaging cruciform portions and the pin 60 merely retains the jaw face in position. It will be apparent that when the wrench is set squarely on a pipe or other object and a load is placed upon the bar 10 the tangential force tending to revolve the pipe will react upon the detachable jaw face 26 tending to slide it out of jaw 22. Hence, larger portion of the thrust will fall upon the arm 54 of the jaw face. It often happens, however, that the wrench is not set thus squarely on the pipe and a thrust in a diagonal direction is exerted. In such a case the strain will be borne by both the arms 54 and 44 which are strong enough to withstand it and no damage will result from this kind of usage. The jaw face is positively retained against displacement under load while the holding pin is relieved from all strain and is not damaged. The pin can readily be removed when it is necessary to replace the jaw face and the annoyance and expense of broken or loosened pins is avoided.

We claim:

1. In a gripping tool, the combination of a pair of relatively movable jaws adapted to receive an object therebetween, one of said jaws having a seat provided with a cruciform recess therein, a detachable jaw face having a seating surface engaging said seat, a projecting portion on the seating surface having cruciform arms closely engaging the sides of the recess, one of said arms and its complemental recess extending laterally of said seat and thus tranversely of the direction of the force which in normal use tends to slide the jaw face across said seat, and means extending parallel to the arm and recess for securing the face on the seat, said means being relieved of stress during normal use by the aforementioned engagement of said arm and recess.

2. In a gripping tool, the combination of a pair of relatively movable jaws adapted to receive an object therebetween, one of said jaws having a seat provided with a cruciform recess therein, a detachable jaw face having a seating surface engaging said seat, a projecting portion on the seating surface having cruciform arms closely engaging the sides of the recess, one of said arms and its complemental recess extending laterally of said seat and thus transversely of the direction of the force which in normal use tends to slide the jaw face across the seat, the other said arm and its complemental recess extending longitudinally of said seat and thus transversely of the first said arm, said last-named recess being deepened for a portion of its length, a raised portion on said longitudinally extending arm and complementary to said deepened portion within which it is received, and means extending through the raised portion and recessed jaw and parallel to the laterally extending arm for securing the face on the seat, said means being relieved of stress during normal use by the afore-mentioned engagement of said arms and recess.

3. A jaw face for gripping tools, said jaw face comprising a generally rectangular plate having a seating surface on one side, a plurality of teeth extending laterally across the side of said plate opposite said seating surface, a projecting portion having cruciform arms extending laterally and longitudinally across the seating surface, and a raised portion on said longitudinally extending arm having a perforation extending transversely therethrough.

4. In a gripping tool, the combination of a pair of relatively movable jaws adapted to receive an object therebetween, one of said jaws having a seating surface thereon, a detachable jaw face having a seating surface engaging the seating surface of said jaw, one of said seating surfaces having a projecting portion and the other hav-

ing a cruciform recess therein, said projecting portion having cruciform arms closely engaging the sides of the recess, one of said arms and its complemental recess extending laterally of said seating surfaces and thus transversely of the direction of the force which in normal use tends to slide the jaw face across the sealing surface of the jaw, and means extending parallel to the arm and recess for securing the face on the seating surface of the jaw, said means being relieved of stress during normal use by the aforementioned engagement of said arm and recess.

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