Sept. 1, 1925. 1,552,091

W. O. THEWES

PIPE WRENCH

Filed April 23, 1924 2 Sheets-Sheet 1

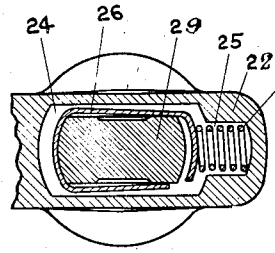


Fig. 3

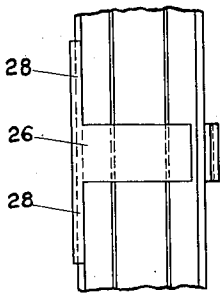


Fig. 4

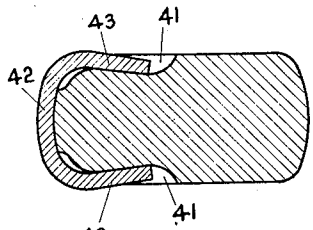


Fig. 5

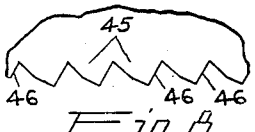


Fig. 8



Fig. 9

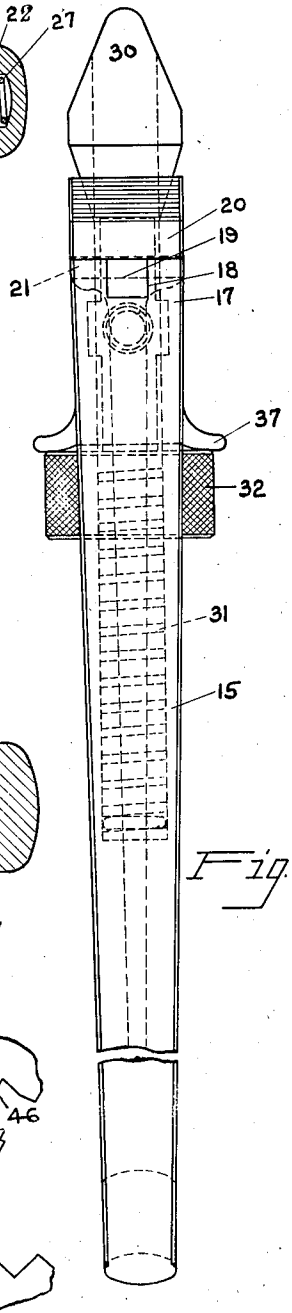


Fig. 2

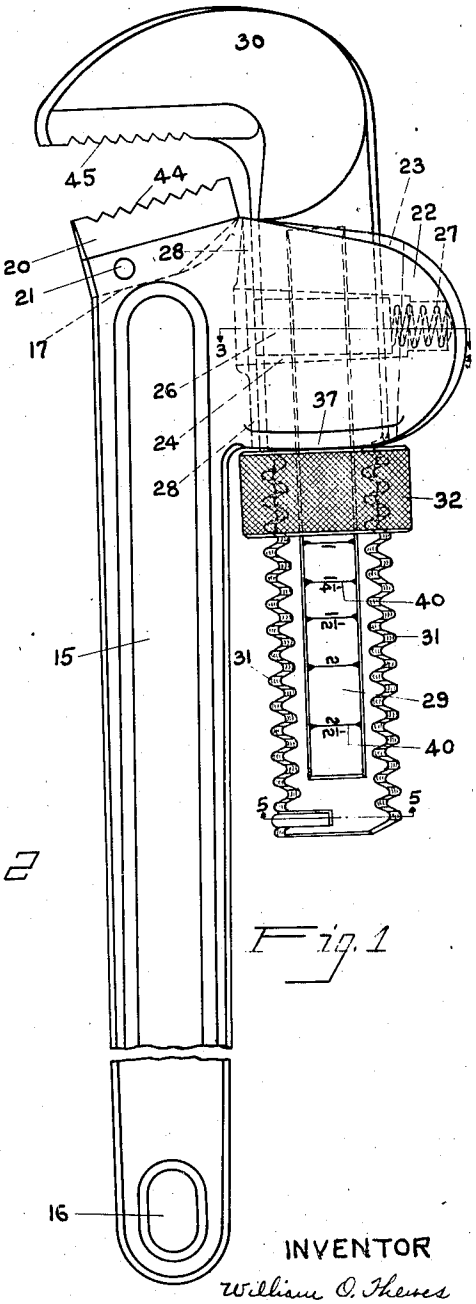


Fig. 1

INVENTOR
William O. Thewes
BY
Richey, Slough & Watts
ATTORNEYS

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W. O. THEWES

PIPE WRENCH

Filed April 23, 1924 2 Sheets-Sheet 2

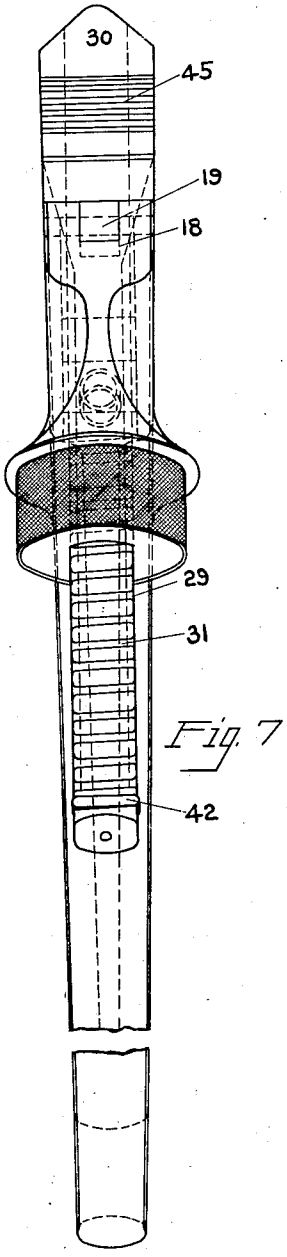


Fig. 7

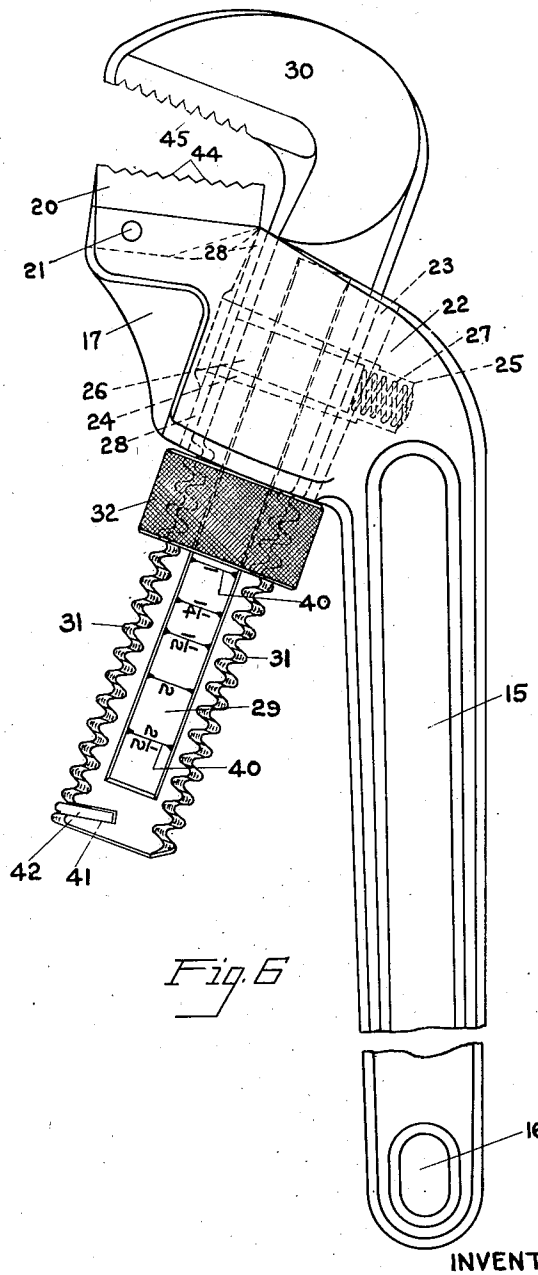


Fig. 6

INVENTOR

William O. Thewes

BY

Richey, Clough & Watts.

ATTORNEYS

Patented Sept. 1, 1925. 1,552,091

UNITED STATES PATENT OFFICE.

WILLIAM O. THEWES, OF NORTH RIDGEVILLE, OHIO, ASSIGNOR TO THE RIDGE TOOL COMPANY, OF NORTH RIDGEVILLE, OHIO, A CORPORATION OF OHIO.

PIPE WRENCH.

Application filed April 23, 1924. Serial No. 708,417.

To all whom it may concern:

Be it known that I, WILLIAM O. THEWES, a citizen of the United States, residing at North Ridgeville, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in a Pipe Wrench, of which the following is a specification.

This invention relates to wrenches and more particularly to wrenches of the type known as pipe wrenches.

An object of my invention is to provide a wrench which can be adjusted and operated by the same hand of a user, while held in either a normal or extended position.

Another object of my invention is to provide a casing through which a threaded jaw carrying shank can be slidably adjusted with a minimum resistance, the casing exerting frictional pressure against the shank to normally maintain it stationary when not being adjusted.

Another object of my invention resides in providing a removable clip which can be quickly assembled with or removed from a threaded jaw carrying shank to retain the nut thereupon or to permit quick assembly or removal of the nut from the shank.

Another object of my invention is to provide jaw teeth for a wrench which are found to withstand a maximum amount of usage and strain.

Another object of my invention is to provide a scale on one of the wrench shanks so that the user can determine the distance between the jaws by the relation of the nut with such shank, in any position of operative adjustment.

These and other objects, and the invention itself will be more readily understood from the following specification.

In the accompanying drawings, illustrating embodiments of my invention—

Fig. 1 is a side elevation of a straight wrench embodying my invention;

Fig. 2 is a front elevational view of the same;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1, showing the casing associated with the shank;

Fig. 4 is a fragmentary side elevation of the slidable shank removed from the wrench with the casing associated therewith;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1 illustrating the removable clip;

Fig. 6 is a side elevational view of an angle wrench embodying my invention;

Fig. 7 is a front elevation of the same;

Fig. 8 is a fragmentary side elevation of the teeth of the slidable jaw; and

Fig. 9 is a side elevation of the teeth of the stationary jaw.

Referring to the drawings by characters of reference 15 represents a handle shank formed preferably of metal. One end of the shank is provided with straight sides adapted to be gripped by the operator, and the other end of the shank has a jaw fixed thereto. A slot 16 is provided in the handle portion of the shank, so that the wrench can be hung up while not in use. A slot 18 is provided transversely and centrally in the end of the jaw end 17 of the handle shank and is adapted to receive a tongue 19 projecting from the jaw 20. The tongue of the jaw is secured in the slot by a pin 21. The jaw end of the shank extends rearwardly at an angle and the jaw also assumes a similar angle.

A housing 22 is fixed to the handle shank adjacent the jaw 20 and is preferably formed integrally with the shank. In Figs. 1 to 4, the housing 22 extends from the rear end of the straight shank, adjacent the fixed jaw 20, while in Figs. 6 and 7 the housing is formed intermediate the ends of an angular shank adjacent the fixed jaw. A slot 23 extends through the housings in both instances, to receive the adjustable jaw carrying shank 29. This slot is rectangular in outline and the wall within the housing 22, forming the rear side of the slot, tapers outwardly from the bottom of the wrench. A recess 24 extends inwardly around the slot intermediate its ends, and a pocket 25 extends into the housing from the rear portion of the slot. The portion of the slot 23 above the recess is larger in outline than the portion of the slot below the recess.

The casing 26 is preferably formed of a single piece of sheet metal bent to a form similar to, but smaller than the slot in the upper portion of the housing 22 and larger than the lower portion of the slot. This casing is inserted through the upper por-

tion of the slot in the housing and when the casing is expanded, as will presently be described, it will seat itself within the recess 24 in the housing. A tongue 28 extends from opposite ends of the front wall of the casing, being of a width less than that of the slot, and of a length such that they extend to the ends of the slot when the casing is assembled in the recess 24. The sides of the casing 26 normally extend toward each other, at their separated ends, and when the sliding shank 29 extends therethrough they are expanded so that they will engage the shoulders formed by the recess 24, thereby preventing removal of the casing from the slot. The casing is of less length than the recess, and a coil spring 27 is seated in the pocket 25 and bears against the rear wall of the casing, normally maintaining it centrally within the recess. The tongues 28 bearing against the wall forming the front of the slot prevent the front portion of the casing from entering the front portion of the recess, so that the casing will not become distorted when the wrench housing is used as a hammer. The recess 24 is longer than the casing, so that the casing will have a limited movement therein. The casing is inserted in the slot in the housing so that the tongues 28 will lie against the front wall forming the slot in the housing. The rear end of the casing does not extend to the rear of the adjacent recess and the coil spring 27 bears against this portion of the casing. The ends of the casing are similar so that the casing can be reversed end for end for assembly within the recess.

A slidable rectangular shank 29 extends through the slot in the housing and is provided at one end with a hook jaw 30, which extends forwardly so that it will cooperate with the jaw fixed to the handle shank. The front and rear walls of the shank are formed with curved threads 31, upon which a round nut 32 is rotatably mounted. The shank 29 is slidably mounted in the casing 26, and the free ends of the sides of the casing will normally exert friction against the shank, due to their resiliency, so that the shank will be maintained against sliding movement therethrough unless moved by the operator. The forward threaded portion of the shank bears against the front portion of the casing and the tongues extending therefrom, while the rear threaded portion of the slidable shank is spaced from the inner rear wall of the casing. The spring 27 bearing against the rear wall of the casing will normally tend to maintain the casing and the jaw end of the slidable shank in their forward position toward the jaw on the handle shank. The tapered slot 23 through the housing will permit the shank to be tilted back or forth, and as the casing is of smaller size than the recess, it will therefore be seen that the casing is tiltable within the recess 24 in which it is seated and that it provides the sole bearing for the slidable shank.

The lower end of the housing terminates in an outwardly extending flange 37, preferably of an area such that it extends beyond the nut 32 which engages thereagainst. The end face of the flange is curved convexly, providing a bearing for the nut on two sides of the housing in any position in which the shank is tilted. The nut is freely rotatable on the end of the threaded shank which extends through the slot, and is spun or rotated into and from engagement with the flanged end of the housing to maintain the jaws in spaced relation, or to permit the slidable shank to be moved to space the jaws the desired distance apart. The nut will rock against the curved flanged end 37 of the housing and maintain the jaws in spaced relation when the shank is tilted either forward or rearward.

In order to definitely indicate to the operator the distance between the jaws, I provide scale markings 40 lengthwise upon the sides of the slidable shank. There are several ways in which such markings can be arranged to indicate the distance between the jaws, and in the drawings they are shown arranged so that the position of the upper edge of the nut 32 relative thereto, when in engagement with the housing, will determine exactly the distance between the jaws. Thus the operator can observe the distance between the jaws when in any operative relation, and the nut can be set at a position on the shank relative to the scale thereon, prior to adjustment of the slidable shank, so that the jaws will be the desired distance apart when the slidable shank is moved to a position so that the set nut engages with the end of the housing. Thus if it is desired to space the jaws for two inch pipe, the nut is rotated upon the shank until its upper end is parallel with the indication "2" on the shank, and the slidable shank is then moved to operative position so that the nut will engage the flanged end of the housing.

The sides of the end of the shank 29 are provided with grooves 41 Figure 5 which extend from between the two end threads on sides of the shank. A U-shaped clip 42, preferably formed of wire, is adapted to extend between such threads with its ends 43 seated within the grooves 41. The legs of the clip are of sufficient resiliency and are spaced apart so that when sprung over the sides of the shank, in position in the grooves, they will retain the clip upon the shank. The clip can be readily assembled with or removed from the shank when desired. The nut can be rotated upon or from the end of the shank when the clip is re-

moved, and when assembled, the clip will prevent the nut from rotating off of the end of the shank.

It will be observed that the line of the points of the jaw teeth are in angular relation when the jaws are in normal position. Wrench teeth, and particularly pipe wrench teeth are subjected to severe strain and hard usage. They operate upon hard metal, generally grip a smooth surface, and are generally placed under severe strain before the object held therebetween is satisfactorily positional. When in operation the teeth of the sliding jaw are subject to a pulling strain, and I have provided teeth therefor which are of a construction to withstand maximum strain and usage. In Fig. 9 I have illustrated the teeth of the stationary jaw, which teeth 44 are formed with straight faces extending at the same angle from the base to provide the joint. In Fig. 8, I have illustrated the teeth of the slidable jaw which teeth 45 are constructed so that the joints will withstand severe usage and strain. The rear faces 46 of the teeth 45 extend to an angle of substantially 30 degrees from a line perpendicular to the base, while the front face of such teeth extend at two angles from such line. Such front faces extend from the base at an angle of 50 degrees and at their outer ends extend at an angle of 70-degrees, which last mentioned face portions form the engaging edge with the rear faces. The outline of such teeth are in the form of a trapezium. In forming the teeth in such manner I add body and strength to the teeth immediately at the front of the edges of the teeth which engage the work, thereby reinforcing the edges and increasing their life. The faces of the teeth 45 can be formed at different angles and shape than those described as long as the material forming the tooth body extends forwardly adjacent the engaging edge of the teeth to reinforce the same.

Various changes can be made in the construction described without departing from the spirit of my invention and the scope of the appended claims.

What I claim is:—

1. A wrench comprising a handle shank having a jaw fixed at one end thereof, a housing having a slot extending therethrough, said housing being fixed to said handle shank adjacent said fixed jaw, a removable casing retained within the slot in said housing, said casing being reversible endwise, a threaded shank extending through the slot in said housing and said casing, a jaw fixed to said threaded shank adapted to cooperate with said jaw fixed to said handle shank, said casing exerting pressure against said jaw to normally maintain it stationary, and means for maintaining said sliding shank in position to secure said jaws in desired space relation for operation.

2. A wrench comprising a handle shank having an integral portion thereof formed as a housing, said housing having a slot therethrough, a jaw fixed to the end of said handle shank adjacent to said housing, a resilient casing mounted within the slot in said housing, a threaded shank slidable through said casing and the slot in said housing, said casing frictionally engaging said shank to normally maintain it stationary relative thereto, a jaw fixed to one end of said slidable shank adapted to cooperate with said jaw fixed to said handle shank, and a nut freely rotatable on the end of the threaded shank extending through said housing adapted to engage with said housing to maintain said jaws in desired spaced relation while in operation.

3. A wrench comprising a handle shank having an integral portion providing a housing, said housing having a slot therethrough and a convexly curved end face, a jaw fixed to one end of said handle shank adjacent said housing, a resilient casing removably mounted within the slot in said housing, a threaded shank slidable through the slot in said housing and said casing, said casing normally creating pressure against said shank to maintain it stationary therewith, a jaw carried by said slidable shank adapted to cooperate with said fixed jaw, a spring within said housing engaging said casing to tilt the jaw-carrying end of said slidable shank toward said fixed jaw, and a nut freely rotatable on said threaded shank adapted to engage the curved end face of said casing through which said shank extends to maintain said jaws in desired spaced relation while in operation.

4. A wrench comprising a handle shank having an integral portion providing a housing, said housing having a slot therethrough, a jaw fixed to one end of said handle shank adjacent said housing, a resilient casing removably mounted within the slot in said housing, a threaded shank slidable through the slot in said housing and said casing, said shank expanding said casing to prevent its removal from said housing, said casing normally creating pressure against said shank to maintain it stationary therewith, a jaw carried by said slidable shank adapted to cooperate with said fixed jaw, and means to secure said jaws in spaced relation.

5. A wrench comprising a handle shank having a jaw fixed at one end thereof, a housing fixed to said shank adjacent said jaw, said housing having a slot therethrough and a recess extending inwardly around a portion of said slot, a resilient cas-

ing removably mounted within the recess in said housing, a threaded shank slidable through said casing and the slot in said housing, said shank expanding said casing within said recess to prevent its removal, a jaw fixed to the end of said slidable shank adapted to cooperate with the fixed jaw, said resilient casing normally exerting pressure against said shank to maintain it stationary therewith, and means for securing said slidable shank to maintain said jaws in desired spaced relation for operation.

6. A wrench comprising a handle shank having a jaw fixed at one end thereof, a housing fixed to said shank adjacent said jaw having a slot therethrough, a resilient casing carried within the slot in said housing intermediate the ends thereof, tongues extending from said casing along the side of the slot in said housing adjacent the jaw fixed to the handle shank and extending to the ends thereof, a shank having two opposite threaded sides extending through said casing and the slot in said housing and slidably mounted therein, said casing frictionally engaging said shank to normally maintain it stationary, said tongues being arranged intermediate the housing and one of the threaded sides of said slidable shank to prevent contact therebetween, a jaw carried by said slidable shank adapted to cooperate with the jaw on said handle shank, and means to secure said slidable shank to maintain said jaws in spaced relation while in operation.

7. A wrench comprising a handle shank having a jaw fixed at one end thereof, a housing fixed to said shank adjacent said jaw having a slot extending therethrough, a threaded shank extending through the slot in said housing, said shank being mounted to slide through said housing and to be tilted therein, a jaw carried by said threaded shank adapted to cooperate with the jaw on said handle shank, a casing retained within said slot through which said threaded shank is frictionally held to normally prevent sliding movement thereof, said casing being arranged to tilt with said shank and to prevent contact of the teeth of said shank with said housing, a spring within said housing bearing against said casing to normally maintain the jaw end of said threaded shank in its forward position toward the jaw of said handle shank, and means to secure said slidable shank with said casing to maintain said jaws in desired spaced relation for operation.

8. In a wrench, a handle shank having a jaw fixed at one end thereof, a housing having a slot extending therethrough fixed to said handle shank adjacent said jaw, a threaded shank extending through the slot in said housing and slidable therein, a jaw fixed to said threaded shank adapted to cooperate with the jaw on said handle shank, a nut rotatable on the portion of said threaded shank extending through the slot in said housing, and a self-retaining clip removably attached to said shank intermediate two of the threads thereon to prevent removal of said nut from the end of said shank.

9. In a wrench, a handle shank having a jaw fixed at one end thereof, a housing having a slot extending therethrough fixed to said handle shank adjacent said jaw, a threaded shank extending through the slot in said housing and slidable therein, a jaw fixed to said threaded shank adapted to cooperate with the jaw on said handle shank, a nut rotatable on the portion of said threaded shank extending through the slot in said housing, said shank having a slot in each side thereof extending from between a pair of threads, and a removable resilient clip extending between said pair of threads and having its ends engaging within the grooves in the sides of said shank, said clip when attached preventing the removal of said nut from said shank.

10. In a wrench, a handle shank having a jaw fixed at one end thereof, a housing having a slot extending therethrough fixed to said handle shank adjacent said jaw, an adjustable shank extending through the slot in said housing and slidable therein, said adjustable shank having a groove extending partially around the lower extremity thereof, a jaw fixed to said adjustable shank adapted to cooperate with the jaw on said handle shank, means carried by said adjustable shank for adjusting the jaw carried thereby with respect to the jaw on the handle shank, and a substantially U-shaped resilient clip adapted to be removably seated in the grooves of said adjustable shank.

In testimony whereof I hereunto affix my signature this 21st day of April, 1924.

WILLIAM O. THEWES.