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PIVOTED OUTER JAW PIPE WRENCH

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This invention relates to a novel and improved pivoted outer jaw pipe wrench.

The primary object of the invention is to provide a simpler, more easily operated, stronger and more efficient pipe wrench of the kind indicated above which provides a positive non-slip grip on pipe, such as oil-field pipe, to the extent that the pipe embraced by the jaws of the wrench will yield before the jaws will slip around the pipe, when properly applied to the pipe.

Another object of the invention is to provide a pipe wrench of the character indicated above wherein the toothed jaw blocks on the movable jaw are readily replaceable when worn, or for the substitution of other jaw blocks for handling pipes of different sizes.

A still further object of the invention is to provide a pipe wrench of the character indicated above which is easier to apply to pipe, and is more easily removable from the pipe after a pipe-turning operation.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

Figure 1 is a contracted side elevation of a pipe wrench of the invention, the movable jaw being in partially open position;

Figure 2 is a bottom plan view of Figure 1; and

Figure 3 is a fragmentary elevation of the side of the wrench opposite that shown in Figure 1, and showing the jaws applied to turn a pipe positioned between the jaws.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated pipe wrench comprises an elongated rigid, and preferably straight handle or lever bar 12 which has fixed on its rear end a transverse hand grip bar 14. At its forward end the lever bar 12 is widened to provide a flat, longitudinally elongated clevis 16 having parallel spaced legs 18, having free-forward ends 20. A transverse assembling and pivot bolt 22 extends removably through centered and registered holes 34 provided in the clevis legs 18 at their free ends.

Removably and fixedly mounted on the outward sides of the clevis legs 18 and extending forwardly beyond their free ends 20, are similar longitudinally elongated fixed jaw blocks 26 which together define a fixed jaw 28. The blocks 26 have in their rear halves longitudinal grooves 30 which open to the rear ends of the blocks and conformably receive outward side portions of the clevis legs 18, as seen in Figure 2. In addition, pairs of spaced and opposed, laterally inwardly extending lugs 32 on the rear ends of the blocks 26 engage the upper and lower sides 35, 36, respectively, of the clevis 16. In line with the clevis leg bolt holes 34 the blocks 26 have holes 38, through which bolt 22 passes. These arrangements provide rigid, strong, and parallel spaced mountings of the jaw blocks 26 on the clevis legs 18. The jaw blocks 26 have forward portions 40 reaching forwardly beyond the

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clevis legs 18 which are leaf- or spear-head shaped, and have similar longitudinally and convexly curved and forwardly converging upper and lower toothed edges 42, 44, respectively, which meet in points 46 at their forward ends, which are on the centerlines of the jaw blocks 26, and the centerline of the handle bar 12. It is to be noted that the fixed jaw blocks 26 can be reversed to opposite sides of the clevis to present the toothed edges 44 to the movable jaw 48 when desired, as when the toothed edges 42 have become worn.

The illustrated pipe wrench further comprises an L-shaped movable jaw 48, which comprises a longitudinally elongated and straight long arm 50, and a short arm 52 which is rigid on the forward end of the arm 50 and is positioned at right angles thereto, and extends downwardly therefrom, or laterally inwardly and crosswise of the fixed jaw 28. At a point near to and spaced forwardly from the rear end thereof, the arm 50 is provided with a transverse pivot hole 54 which receives the bolt 22 and which positions the movable jaw 48 swingably between the clevis arms 18, with the short arm 52 spaced forwardly from the forward end of the fixed jaw 28. Spacing washers 55 are positioned on the bolt 22 between the opposite sides of the long arm 50 and the inward sides of the clevis legs 18.

For holding the movable jaw 48 away from the related side of the fixed jaw 28, to facilitate application of the wrench to a pipe, a spring arrangement is provided, which comprises an L-shaped, rearwardly extending lug 56 which is fixed on and rises from a middle part of the upper side 58 of the long arm 50; and terminates at its rear end in a clevis 60 across which extends a bolt or rivet 62. An upstanding rigid ear 64 is fixed on the upper side 34 of the clevis 16 at a point near the rear end of the clevis and spaced at a substantial distance behind the fixed jaw 28 and hence from the pivot bolt 22 and the rear end of the movable jaw 48. A threaded shaft 66 slides through an opening 67 in the ear 64 and has a chamfered nut 68 threaded on its rear end for stop engagement, at times, with the rearward side of the ear 64. The shaft 66 is pivotally secured, at its forward end, to the bolt 62 between the arms of the clevis 60. Circumposed on the shaft 66 and compressed between the ear 64 and an annular flange 70 on the shaft 66 is a heavy helical spring 72. The nut 68 is adjustable on the shaft 66 to bear against the ear 64 and hold the movable jaw in a partly open position, as in Figure 1.

For easy opening of the movable jaw 48 to release it from a pipe P gripped between it and the fixed jaw, as shown in Figure 3, and to facilitate disengagement of the jaws from the pipe, an outstanding jaw handle 74 is provided on the forward side of the short arm 52 near its free end 76, and comprises an arm 78 extending at right angles to the arm 52 and terminating at its outer end in a lateral hand stop 80 which is directed downwardly or away from the long arm 50. Pulling up on the jaw handle 74 opens the movable jaw 48 against the resistance of the spring 72.

Fixed on and extending rearwardly at right angles to the short jaw arm 52 at the free end thereof is a nose 82 which has a flat inward side 84 facing and parallel to the inward or lower side 86 of the long arm 50, and the inward or rearward side 88 of the short arm 52 is flat and at right angles to the sides 84 and 86. In the sides 84 and 86 are formed lengthwise, centered squared grooves 90 and 92, respectively, in which are seated the lengthwise, centered ribs 94 on the inner sides of removable jaw blocks 96 and 98, respectively, which have longitudinally spaced, pipe-gripping teeth 100 on the outward sides. The toothed outer sides of the jaw blocks 96, 98 are flat or rectilinear as compared to the longitudinal curvature of the toothed sides of the fixed jaw blocks 26. The jaw

blocks 96, 98 are fixed removably in place by means of screws or pins 102, 104 which pass through the related jaw arms and through the related jaw block ribs. Further, the jaw blocks 96, 98 abut each other and the inward side 84 of the nose 82 at related ends, whereby these blocks are further stabilized in their positions.

As indicated in Figure 3, the wrench is applied to rotate a pipe P by pulling the movable jaw 48 away from the fixed jaw 28, against the resistance of the spring 72 or by forcing the jaws onto the pipe, utilizing the angled cam surface 106 on the inward corner of the movable jaw nose 82 and the angularity of the related toothed edge of the fixed jaw 28, so that the toothed sides of both of the movable jaw blocks 96 and 98 engage the pipe P at two circumferentially spaced points, and the toothed edges of the fixed jaw blocks 26 engage the opposite side of the pipe from the movable jaw block. Thereupon, swinging of the lever bar 12 in the appropriate direction tightens the jaws on the pipe P and causes their teeth to bite into and attain a positive, firm-grip on the pipe.

Although there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A pipe tongs comprising an elongated lever having a forward end, a pair of laterally spaced fixed longitudinal jaws mounted on said forward end and having longitudinally and convexly curved toothed edges, an L-shaped movable jaw having a longitudinal arm, said longitudinal arm being disposed between said fixed jaws, a short arm on the forward end of said longitudinal arm and being at right angles to said longitudinal arm and spaced forwardly from the forward end of the fixed jaws, means pivoting said longitudinal arm at a point intermediate its ends on said lever at a point behind said fixed jaws, said longitudinal arm and said short arm having intersecting inward gripping sides facing the curved toothed edges of the fixed jaws, and expanding spring means acting between said lever and said movable jaw at a point rearwardly of the fixed jaws and a point intermediate the ends of the longitudinal arm thereof and urging said movable jaw toward said fixed jaws.

2. A pipe tongs comprising an elongated lever having a forward end, a pair of laterally spaced fixed longitudinal jaws mounted on said forward end and having longitudinally and convexly curved toothed edges, an L-shaped movable jaw having a longitudinal arm, said longitudinal arm being disposed between the fixed jaws, a short arm on the forward end of the longitudinal arm and being at right angles to said longitudinal arm and extending crosswise of said fixed jaws, means pivoting said longitudinal arm at a point intermediate its ends on said lever at a point rearward of the fixed jaws, said longitudinal arm and said short arm having inward gripping sides facing the curved toothed edges of the fixed jaws, spring means acting between said lever and said movable jaw at a point rearwardly of the fixed jaws and at a point intermediate the ends of the longitudinal arm thereof and urging said movable jaw toward said fixed jaws, and

outstanding jaw-opening handle means on the short arm of the movable jaw for opening the movable jaw against the resistance of said spring means.

3. A pipe tongs comprising an elongated handle lever having a longitudinal clevis on its forward end, said clevis having laterally spaced legs having free forward ends, fixed longitudinal jaw blocks removably fixed on the outward sides of said legs and extending forwardly from the legs, means preventing rotation of the fixed jaw blocks on the legs, an assembling and pivot bolt extending through the fixed jaw blocks in the clevis legs and holding the fixed jaw blocks in place thereon, said fixed jaw blocks having longitudinally and convexly curved toothed edges, an L-shaped movable jaw having a longitudinal arm and having a short lateral arm on its forward end extending crosswise of said fixed jaw blocks, said arms having inward sides, said longitudinal arm being journaled on said bolt between the clevis legs at a point intermediate the ends of the longitudinal arm with said short arm spaced forwardly from the fixed jaw blocks, an outstanding lug on the outward side of said longitudinal arm, a fixed outstanding ear on said clevis at a point spaced rearwardly from the fixed jaw blocks and the rear end of the longitudinal arm, a spring secured to and compressed between said lug and said ear and urging said movable jaw away from said fixed jaw blocks.

4. A pipe tongs comprising an elongated handle lever having a longitudinal clevis on its forward end, said clevis having laterally spaced legs having free forward ends, a fixed jaw comprising a pair of fixed longitudinal jaw blocks removably engaged with the outward sides of said legs, means preventing rotation of the fixed jaw blocks on the legs, an assembling and pivot bolt extending through the fixed jaw blocks and the clevis legs and holding the fixed jaw blocks in place thereon, said fixed jaw blocks having longitudinally and convexly curved toothed edges, an L-shaped movable jaw having a longitudinal arm having a short lateral arm on its forward end extending crosswise of said fixed jaw, said arms having inward sides, said longitudinal arm being journaled on said bolt between the clevis legs at a point intermediate the ends of the long arms, with said short arm spaced forwardly from the fixed jaws, an outstanding lug on the outward side of said long arm, a fixed outstanding ear on said clevis at a point spaced rearwardly from the fixed jaw and the rear end of the long arm, a spring secured to and compressed between said lug and said ear and urging said movable jaw away from said fixed jaws, said fixed jaw blocks having grooves in their inward sides receiving portions of the outward sides of the clevis legs and constituting said rotation preventing means.

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