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PIVOTED OUTER JAW PIPE WRENCH

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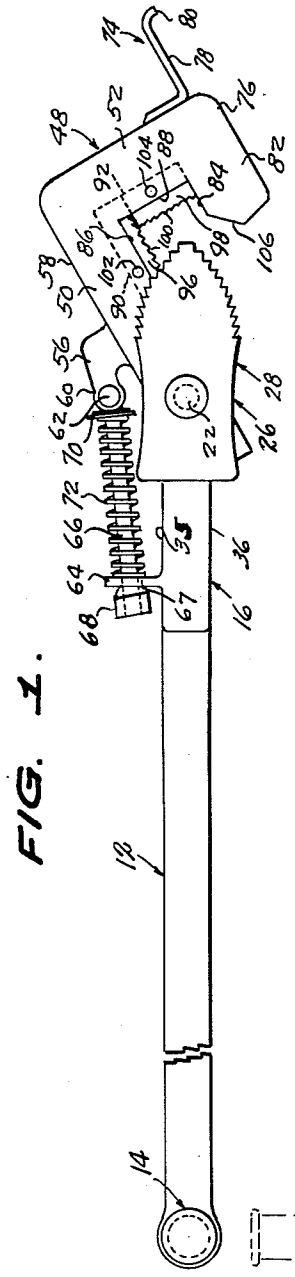

FIG. 1.

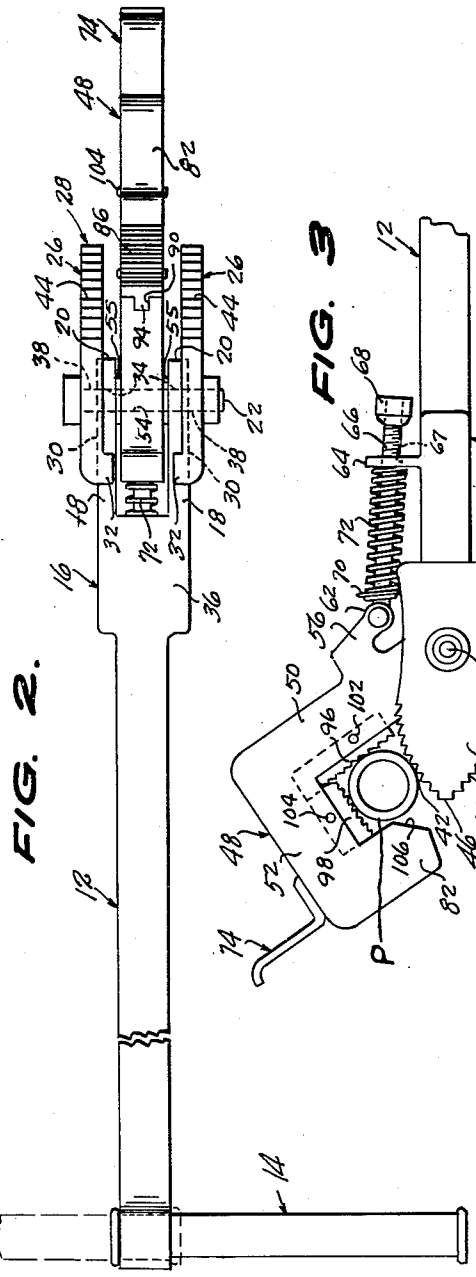

FIG. 2.

FIG. 3

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PIVOTED OUTER JAW PIPE WRENCH

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4 Claims. (Cl. 81—99)

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

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 **16** 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 appropirate 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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