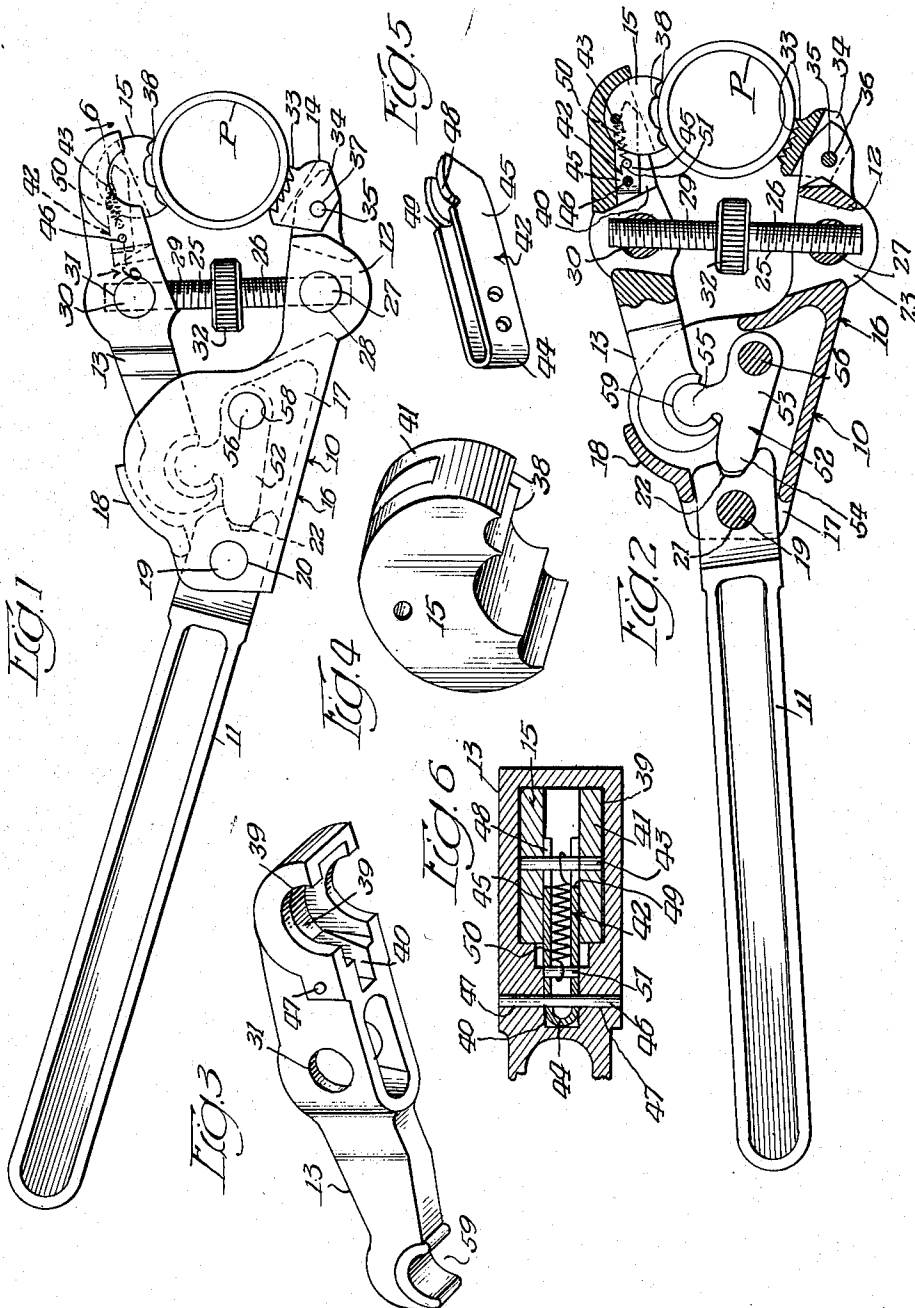


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PIPE WRENCH HAVING ARM WITH A RECESS THEREIN
AND A PIVOTALLY-MOUNTED SPRING-BIASED
PIPE-ENGAGING JAW IN THE RECESS
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PIPE WRENCH HAVING ARM WITH A RECESS
THEREIN AND A PIVOTALLY MOUNTED
SPRING-BIASED PIPE-ENGAGING JAW IN
THE RECESS

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2 Claims. (Cl. 81-179)

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The present invention relates generally to wrenches. More particularly the invention relates to that type of wrench which is designed primarily for use in turning a pipe or like article and as its principal components or parts comprises: (1) an elongated housing-like body; (2) a handle which projects inwards from the inner end of the body; (3) a first arm which is connected fixedly to, and projects outwards from, the outer end of the body and is provided at its outer end with a laterally extending, pivotally mounted, pipe-engaging jaw; (4) a second arm which is disposed in opposed relation with the first arm and embodies at its outer end a laterally extending, pivotally mounted, pipe-engaging jaw; (5) an adjusting screw which is adapted to move the second arm to and from the first arm for the purpose of adjusting the wrench to grip pipes of different diameters or sizes and has its ends pivotally connected by pivot pins to the central portions of the arms respectively, and (6) mechanism operative automatically in response to swinging of the handle in a direction away from the second arm after application of the jaws to a pipe to move the second arm outwards away from the body and also to swing or tilt the second arm in such direction as to cause its jaw to move towards the jaw on the first arm.

The primary object of the invention is to provide a pipe wrench of the aforementioned type in which the pipe-engaging jaw on the outer end of the second arm is mounted in a novel manner for limited pivotal movement and has associated with it a spring whereby the jaw is urged rotatively in the direction of its inner end in order that its pipe-engaging surface is most advantageously positioned for reception of the pipe to be turned by the wrench.

Another object of the invention is to provide a pipe wrench which, due to the arrangement and manner of mounting of the jaw in the outer end of the second arm, is generally of new and improved construction, may be manufactured or fabricated at a comparatively low cost, effectively and efficiently fulfills its intended purpose, and is so constructed that it may be quickly and readily applied to, and removed from, a pipe or like article to be turned.

Other objects of the invention and the various advantages and characteristics of the present pipe wrench will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

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In the drawing which accompanies and forms a part of this specification or disclosure and in which like letters and numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a side elevation showing a pipe wrench embodying the invention with the handle swung toward the second arm and in the position it normally assumes preparatory to application of the jaws of the wrench to a pipe to be turned;

Figure 2 is a view partly in section and partly in side elevation showing the wrench after the handle has been swung relatively to the body in a direction away from the second arm so as to move the second arm outwards away from the body and also to tilt the arm so as to cause the jaw thereon to move towards the jaw on the first arm;

Figure 3 is a bottom perspective of the second arm, i. e., the arm that is movable to and from the fixed arm in response to manipulation of the adjusting screw;

Figure 4 is a perspective of the jaw that is pivotally mounted on the outer end of the second arm;

Figure 5 is a perspective of the pin equipped U-shaped clip which serves to anchor one end of the spring for retracting the jaw on the second arm and also to hold such jaw in pivotally connected relation with the outer end of the second arm; and

Figure 6 is an enlarged horizontal section on the line 6-6 of Figure 1.

The wrench which is shown in the drawings constitutes the preferred form or embodiment of the invention. It is primarily designed or adapted for use in turning a pipe *p* and as its principal parts comprises an elongated housing-like body 10, a handle 11, a pair of oppositely disposed arms 12 and 13, and a pair of pipe engaging jaws 14 and 15.

The body 10 is preferably in the form of a one-piece metallic casting and consists of a bottom wall 16, a pair of side walls 17 and a top wall 18. The two side walls are spaced a small distance apart and have the lower portions thereof joined to the side margins of the bottom wall and their upper portions joined to the side margins of the top wall. As shown in Figures 1 and 2 the body is horizontally elongated and is open at its ends.

The handle 11 is in the form of a one-piece forging or metallic casting and is adapted to have one end thereof gripped by the user in connection with use of the wrench for pipe turn-

ing purposes. The other end of the handle extends into the inner end portion of the interior of the body 10 and is pivotally connected to the adjacent portion of the body by way of a horizontal pivot pin 19. The latter permits the handle to swing up and down to a limited extent relatively to the body 10 of the wrench and has its ends fixedly mounted within aligned or registering circular holes 20 in the inner end portions of the side walls 17 of the body. The central portion of the pivot pin 19 extends loosely through a circular hole 21 in the adjacent or proximal end of the handle 11. The hole 21 is located a small distance inwards of the extremity of the proximal end of the handle and such extremity is provided with a notch 22. As shown in Figure 2 the notch is arcuate and extends lengthwise of the handle.

The arm 12 projects outwards from the outer lower corner of the wrench body 10 and has its inner end formed integrally with the outer end of the bottom wall 16 and the outer lower portions of the side walls 17 of the body. The central portion of the arm 12 is shaped to form a substantially vertical socket 23. The latter extends completely through the arm 12 and has open ends. The outer end of the arm 12 is of reduced width or thickness, as shown in Figures 1 and 2.

The arm 13 overlies the arm 12 and is movable to and from the latter, as hereinafter described. The inner end of the arm 13 extends through the open outer end of the body and is disposed in the upper central portion of the interior of the body. The central portion of the arm 13 is shaped to form a substantially vertical socket 24 and this extends completely through the arm and is substantially vertically aligned with the socket 23 in the central portion of the arm 12. As will be noted from Figures 1 and 2 of the drawings, the movable arm 13 projects outwards a comparatively small distance beyond the fixed arm 12. An upstanding adjusting screw 25 serves as a medium or instrumentality for moving the arm 13 to and from the arm 12. This screw has its lower end disposed in the socket 23 and its upper end disposed in the socket 24. The lower end of the screw 25 has a right hand screw thread 26 and extends through a threaded hole in the central portion of a transversely extending pivot pin 27. The ends of this pivot pin are journaled or rotatably mounted in a pair of coaxial or aligned circular holes 28 in the sides of the socket defining central portion of the fixed arm 12. The pivot pin 27 permits the adjusting screw 25 to swing back and forth between the outer end of the arm 12 and the outer end of the body 10. The upper end of the adjusting screw is provided with a left hand screw thread 29 and extends through a threaded hole in the central portion of a transversely extending pivot pin 30. The ends of the pivot pin 30 are journaled or rotatably mounted in a pair of coaxial holes 31 in the sides of the socket defining central portion of the arm 13. The central portion of the adjusting screw 25 is provided with an enlarged cylindrical knob 32 for screw turning purposes. When the screw is turned in one direction the arm 13 moves towards the fixed arm 12 and when the screw is reversely turned or rotated the arm 13 is moved away from the fixed arm 13. By turning the adjusting screw 25 the arms 12 and 13 may be adjusted to receive pipes of different diameters. The pivot pin 30 permits the movable arm 13 to rock or tilt relatively to the adjusting screw 25.

The jaw 14 is associated with, and carried by, the fixed arm 12. It is located at the outer end of such arm and has a convex upper face and a flat bottom face. The upper face of the jaw 13 is provided from the front end thereof to the rear end with transversely extending pipe-engaging teeth 33. The bottom portion of the jaw 14 is provided with a pair of laterally spaced, depending integral lugs 34 and these straddle the outer end of the fixed arm 12. A pin 35 extends through, and is fixed within, a transverse hole 36 in the outer end of the fixed arm 12. The ends of the pin project beyond the sides of the outer end of the arm 12 and fit within holes 37 in the depending lugs 34 on the jaw 14 in order to permit such jaw to rock or tilt outwards and inwards with respect to the fixed arm 12. The outer portion of the upper surface of the fixed arm 12 is downwardly inclined with respect to the contiguous portion of the upper surface of the fixed arm in order to permit the desired rocking or tilting of the jaw 34. As shown in my aforementioned patent, each of the holes 37 in the depending lugs 34 of the jaw 14 may have a greater diameter than the pin 35 in order to provide proper looseness and enable the jaw readily to seat itself when it is applied to the pipe p.

The jaw 15 is associated with, and carried by, the movable arm 13. It underlies the outer end of the last-mentioned arm and is disposed slightly outwards or forwards of the jaw 14. As shown in Fig. 4, the jaw 15 is substantially semi-cylindrical and has a concave bottom face with downwardly extending transverse teeth 38. The curved or arcuate peripheral portion of the jaw 15 fits within a semi-circular recess 39 in the lower portion of the outer end of the movable arm 13. This recess extends lengthwise or longitudinally of the movable arm and has its rear or inner end portion in communication with a pocket 40. The latter is of less width than the recess 39 and is located between the recess and the socket 24 in the central portion of the movable arm 13. The recess 39 has the same radius as the jaw 15 and permits the jaw to turn or rotate back and forth about the axis or center thereof. The upper central portion of the jaw 15 has a longitudinally extending semi-cylindrical cutout 41 as shown in Figure 4. A U-shaped clip 42 and a pin 43 serve to hold the jaw 15 in connected relation with the outer end of the movable arm 13 while at the same time permitting the jaw to rock or rotate about its axis. The clip 42 is preferably in the form of a stamping of heavy gauge metal and consists of a crosspiece 44 and a pair of side pieces 45. It is so positioned or arranged that the crosspiece 44 and the adjacent ends of the side pieces 45 are disposed in the pocket 40 and the outer or free ends of the side pieces project into the cutout 41 in the upper central portion of the jaw 15. A transversely extending pin 46 holds the clip immovably in place. This pin has its ends fixedly mounted in aligned holes 47 in the portions of the movable arm 13 that define the pocket 40. The central portions of the pin extend through aligned holes in the ends of the clip side pieces 45 that are connected to the crosspiece 44. The outer or free ends of the side pieces of the clip 42 have the upper corners thereof cut away in such manner as to form fingers 48, the upper surfaces of which are convexly curved. The pin 43 extends transversely across the upper central portion of the jaw 15 and has its ends fixedly mounted in

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aligned holes in the jaw. The central portion of the pin 43 extends across the cutout 41 and rests on, and engages slidably, the convexly curved upper surfaces of the fingers 48. The pin 43 coacts with the fingers 48 on the free ends of the side pieces 45 of the clip 42 to hold the jaw 15 in connected relation with the outer end of the arm 13 while at the same time permitting the arm to rock or rotate about its center. The outer upper corners of the clip side pieces 45 define shoulders 49 which coact with the pin 43 to limit counterclockwise turning or rotation of the jaw 15 as viewed in Figures 1 and 2. The jaw 15 is urged in a counterclockwise direction by way of a helical tension spring 50. The latter is located between the side pieces 45 of the clip 42 and has one end thereof anchored to the central portion of the pin 43. The other end of the spring is anchored to a transversely extending pin 51 which is located outwards of the clip retaining pin 46 and has its ends mounted in aligned holes in the inner ends of the clip side pieces 45. When the wrench is not in use the spring 50 rotates the jaw 15 in a counterclockwise direction until the pin 43 strikes against the shoulders 49. When the pin is in abutment with the shoulder the tooth equipped bottom surface of the jaw faces forwards and downwards and hence may readily be manipulated into gripping relation with the pipe *p*. In connection with application of the wrench to the pipe the jaw 15 is caused to rotate in a clockwise direction as viewed in Figures 1 and 2 until the teeth 38 are in firm gripping relation with the pipe.

In addition to the parts heretofore mentioned the wrench comprises an inverted T-shaped lever 52 which, after application of the jaws 14 and 15 of the pipe *p* and in connection with downward swinging of the handle 11 relatively to the body 10, automatically causes the movable arm 13 to move outwards a small distance from the body and also to tilt in such direction as to cause the jaw 15 thereon to move towards the jaw 14. This lever 52 is located in the central portion of the interior of the body 10 and is preferably in the form of a one-piece heavy metal stamping. It consists of an outwardly extending leg 53, an inwardly extending leg 54 and an upwardly extending leg 55. The outwardly extending leg 53 is located a small distance above the outer end of the bottom wall 16 of the body 10 and is pivotally supported by way of a transversely extending pivot pin 56. The latter extends loosely through a circular hole 57 in the outwardly extending leg 53 of the lever 52 and has its ends fixedly mounted in coaxial circular holes 58 in the side walls 17 of the wrench body 10. It forms the articulation point for the lever and permits the latter to swing upwards and downwards. The inwardly extending leg 54 has a rounded or curved outer extremity and this fits within the notch 22 in the extremity of the pivoted end of the handle 11. When the handle is swung downwards, i. e., in a counterclockwise direction as viewed in Figures 1 and 2, the lever 52 is caused to swing upwards relatively to the body. Reverse or upward swinging of the lever 11 results in the lever 52 swinging downwards. The upwardly extending leg 55 of the lever has a rounded upper end and this fits pivotally within a three-quarter round socket 59 in the inner end of the movable arm 13 of the wrench. In response to downward swinging of the handle 11 relatively to the body 10 the arm 13 is caused to move outwards and also tilt in a clockwise direction as viewed in Figures 1 and 2. When the lever 52 is swung downwards in re-

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sponse to upward swinging of the handle 11 with respect to the body 10 the movable arm 13 is caused to move inwards and also to tilt in a counterclockwise direction.

When it is desired to use the wrench to turn the pipe *p* the user first adjusts the movable arm 13 so as to space apart the jaws 14 and 15 to the proper extent to receive the pipe. The adjustment is effected by turning the screw 25 in one direction or the other, depending upon whether it is desired to move the arm 13 to or from the fixed arm 12. After the arm 13 is properly adjusted so that the jaws are set or positioned to receive the pipe the handle 11 is swung into the position shown in Figure 1 and the wrench is shifted bodily toward the pipe in order to bring the jaws into gripping relation with opposite portions of the pipe. Following shift of the wrench towards the pipe the handle 11 is swung downwards. In connection with initial downward swinging of the handle the handle swings relatively to the body 10 and operates through the medium of the inverted T-shaped lever 52 to cause the movable arm 13 to move outwards from the body 10 and also to tilt in such direction as to cause the jaw 15 firmly to grip the adjacent portion of the pipe. After the jaw 15 is in firm gripping relation with the pipe further downward swinging of the handle will result in corresponding turning of the pipe *p*. To remove the wrench it is only necessary to swing the arm 11 upwards relatively to the body. Such swinging movement of the arm results in the lever 52 tilting the movable arm 13 so as to withdraw the jaw 15 from the pipe and also to move such arm bodily towards the body. If it is desired to turn the pipe *p* in a clockwise direction as viewed in the drawings instead of a counterclockwise direction the wrench is reversed, i. e., it is turned upside down.

The herein described wrench effectively and efficiently fulfills its intended purpose by reason of the fact that it includes the inverted T-shaped lever 52 which in response to swinging movement of the handle 11 relatively to the body 10 in a direction away from the arm, causes the arm to move outwards and also to tilt to such an extent that its jaw 15 firmly grips the pipe. Due to its specific construction and design the wrench may be produced at a comparatively low cost. The adjusting screw 25 permits the movable arm 13 to be quickly adjusted to and from the fixed arm 12 in connection with application of the wrench to pipes of different diameters.

Whereas the wrench has been described as a medium for turning a pipe it is to be understood that it may be used to turn any other article. It is also to be understood that the invention is not to be restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

This application is a division of application Serial No. 88,581, filed by me on April 20, 1949, and now Patent No. 2,579,594, dated December 25, 1951.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A pipe wrench comprising an arm provided at its outer end with a longitudinal arcuate recess and also a pocket in communication with the recess, a substantially semi-cylindrical jaw seated in the recess and slidable on the arcuate wall of the recess, said jaw being pro-

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vided exteriorly of said recess with a teeth-equipped pipe-engaging face, and having a cutout in its inner portion and a pin extending transversely across the cutout, and an elongated clip having one end thereof disposed and anchored within the pocket and its other end disposed in the cutout and provided with a finger having a convex surface spaced from, and in concentric relation with, said arcuate wall for sliding engagement with the pin to hold the semi-cylindrical jaw in the recess while at the same time permitting it to slide back and forth along said arcuate wall.

2. A pipe wrench comprising an elongated arm provided at its outer end with a longitudinally extending arcuate recess and also a pocket in communication with the recess, a substantially semi-circular jaw seated in the recess and slidable on the arcuate wall of said recess, said jaw being provided exteriorly of said recess with a teeth-equipped pipe-engaging face, and having a cutout in its inner portion and a pin extending transversely across the cutout, an elongated U-shaped clip consisting of a crosspiece and a pair

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of side pieces, the crosspiece of the clip being disposed and anchored within the pocket, a transversely extending pin anchored in the side pieces of the clip and spaced from the crosspiece, the free ends of said side pieces being disposed in the cutout and provided with fingers having convex surfaces spaced from, and in concentric relation with, said arcuate wall and arranged in such sliding engagement with the jaw pin as to hold the jaw in the recess while at the same time permitting said jaw to slide along said arcuate wall, and a helical tension spring anchored at one end to the clip pin and at its other end to said jaw pin, and adapted to urge the jaw in the direction of said pocket.

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