July 7, 1953 L. C. OSBORN 2,644,358

SAFETY WRENCH FOR TUBES AND PIPES

Filed Jan. 3, 1950

FIG. 1.

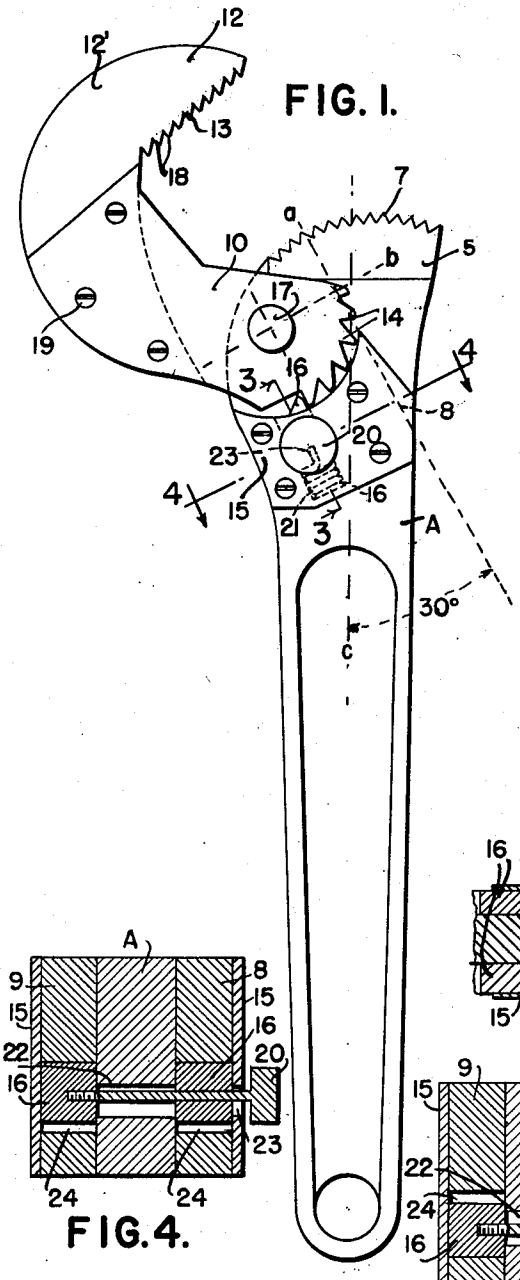


FIG. 2.

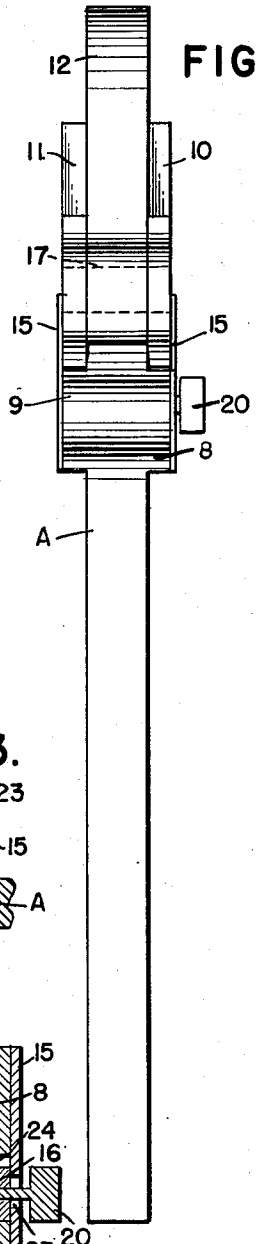


FIG. 3.

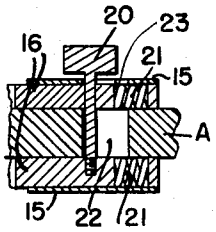


FIG. 4.

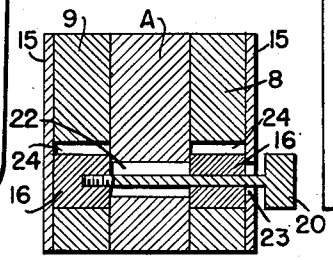


FIG. 5.

INVENTOR.

BY Leonard C. Osborn

his Attorney

John L. Woodward

Patented July 7, 1953 2,644,358

UNITED STATES PATENT OFFICE

2,644,358

SAFETY WRENCH FOR TUBES AND PIPES

Leonard C. Osborn, Salt Lake City, Utah

Application January 3, 1950, Serial No. 136,452

6 Claims. (Cl. 81—98)

1

My invention relates to wrenches, and more particularly to pipe wrenches, and has for its object to provide a new and highly efficient automatically self-adjusting, all purpose wrench adapted for use as a pipe wrench or as a wrench to turn nuts, bolts or other articles which it is desired to turn, such as line shafts and the like.

A further object of my invention is the provision of a wrench of the character indicated in which a minimum-gap limiting device is employed to allow the wrench to be used on thin tubing yet preventing it from crushing this tubing by limiting the amount of closure of the movable jaw when the minimum-gap limiting device is set into play. This minimum-gap limiting device may or may not be used as the need requires, thus providing a wrench of many purposes and utilities.

These objects I accomplish with the wrench shown in the drawings in which Figure 1 is a side elevation of a preferred embodiment of the wrench;

Figure 2 is an edge view thereof;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a detail sectional view of the wrench taken on the line 4—4 in Figure 1; and

Figure 5 is a detail sectional view of the wrench taken parallel to Figure 4 but with the minimum-gap limiting device locked in retracted position.

In the drawings Figure 1 shows the wrench with the handle A as made of a single casting with the end forming the head 5. The head 5 is made substantially circular in form when viewed from the flat side with an arc cut where the handle is joined to the head.

The circular face of the head 5 is formed with teeth 7 and on each side of the head there are raised sections 8 and 9, which may be formed integral with handle A, as shown in Fig. 2, or separate therefrom, as shown in Figs. 3 to 5, the outside surfaces of said raised sections lying flush with the bifurcated legs 10 and 11 of the pivoted jaw 12. The jaw 12 is formed so as to have an outer perimeter 12', the curve of the greater portion of which for example is circular, and the two sides or legs 10 and 11 extend down from each side of the jaw and are secured to the jaw by screws 19 or by other suitable means.

The jaw is formed to appear like a parrot beak when viewed from the side, and the central portion of the jaw is cut away as an arc shown in dotted lines in Figure 1 to permit pivotal movement of the jaw on the head. The legs 10 and 11 are formed with sufficient distance therebetween to encompass the central pivot portion of the head

2

5 and a pivot pin or screw 17 is passed through the head and the two legs to pivot the jaw to the head. This screw 17 passes through both legs and the head to engage the jaw to the head in operative relationship thereto. The flat jaw portion 13 of the jaw is formed with teeth or notches 18 adapted to engage the perimeter of the pipe or nut and the teeth slant in a direction opposed to the teeth in the head 5, the slope of the notches being in such a manner that they will automatically grip upon a surface when the handle is moved in a counter-clockwise direction and will slide over the surface when the handle direction is reversed. This direction of rotation of the handle is described when looking at the wrench as shown in Figure 1 and would be the reverse when viewed from the opposite side.

The head and the jaw are preferably made of laminated metal for greater strength. The flat surface of the jaw may be formed with teeth or not as desired.

The ends of the legs 10 and 11 which engage over the sides of the wrench head are provided with notches 14, and the raised sides 8 and 9 of the handle head adjacent the legs are provided with cover plates 15 and with grooves 24 which slidably mount dogs 16 operable by a movable rod 20 for withdrawal of the dogs from the notches when desired. Each dog is spring held in contact with the notches by springs 21 which are carried back of the dogs in the grooves 24 which are cut in the side sections 8 and 9. A slot 22 is cut through the handle A to permit for passage of the rod 20 when movement is needed, or when adjustment of the dog is desired. The notches 14 are each formed by two walls, one wall being radially directed and the other wall making an acute angle therewith when measured clockwise (as viewed in Figure 1); and each dog 16 is formed with two converging surfaces complementary to said walls, so that the angular wall will depress and ride over the dog 16, when either the outer jaw 12 or the handle is moved so as to increase the gap between the jaws, and so that the radially directed wall will be blocked by the dog 16 (unless the latter is manually retracted by the button 20) when said jaw and handle are relatively moved in gap-decreasing directions, whereby the crushing of thin tubing is either prevented or minimized. If it is desired to withdraw the dog from the notches in order to use the wrench in the conventional manner, the rod is moved back, thus disengaging the dogs from the teeth, the rod then being engaged in a bayonet slot 23 in the plate 15.

The pivot 17 of the wrench is set at a predetermined point in relationship to the angled relationship of the handle to the head and this is done for example by setting the pivot down one half inch from the arc of the head 5 on a center line which is drawn through the exact diameter of the head 5 and offset one half inch to one side on a line at right angles to the center line. This center line is shown as the dotted line *a* and the offset pivot is shown on the line *b* at right angles to the line *a*. When this is done the angle of the handle A is substantially 30° from the center line as shown by the dotted line *c*.

As many possible embodiments of my invention may be made and as many changes may be made in the embodiment hereinbefore set forth, it will be distinctly understood that all matter described herein is to be interpreted as illustrative and not as a limitation.

Having thus described my invention I claim:

1. A minimum-gap limiting wrench comprising in combination, a handle having a head at one end thereof, a movable jaw overlapping said handle and pivoted to the same at said head end for relative pivotal movement and having a work-engaging surface confronting a work-engaging face of said head so as to grip an object therebetween upon operation of said handle, and a series of stops and co-acting manually retractable latch means on said handle and movable jaw to restrict closing movement of said jaw to a minimum-gap as determined by setting said latch means in advance of one of said series of stops.

2. A minimum-gap limiting wrench comprising in combination, a handle having a head at one end thereof, a movable jaw overlapping said handle and pivoted to the same at said head end for relative pivotal movement and having a work-engaging surface confronting a work-engaging face of said head so as to grip an object therebetween upon operation of said handle, and a series of teeth and co-acting manually retractable latch means on said handle and movable jaw, said teeth having faces so inclined as to block relative closing movement of said jaw and the head end of said handle when any of said teeth abut said latch means, and having opposite faces so inclined as to ratchet freely past said latch means during relative opening movement of said jaw and head.

3. A minimum-gap limiting wrench comprising in combination, a handle having an outwardly curved head at one end thereof, a movable jaw overlapping said handle and pivoted to the same at said curved head end for relative pivotal movement and having a work-engaging surface confronting the curved face of said outwardly curved head for plying to and from the same by operation of said handle, a series of teeth and co-acting longitudinally movable dog means provided individually on said handle and movable jaw, said teeth having faces so inclined as to block closing movement of said jaw when any of said teeth abut said dog means, and having opposite faces so inclined as to ratchet freely past said dog means during movement of said jaw in an opening direction, and spring means resiliently urging said dog means to engagement with said teeth.

4. A minimum-gap limiting wrench comprising in combination, a handle having an outwardly curved head at one end thereof, a movable jaw having legs straddling said handle and pivoted to the same at said curved head end and having a substantially flat work-engaging face confronting said outwardly curved head for plying to and from the same by operation of said handle, dogs mounted for longitudinal sliding movement on opposite sides of said handle, and manually operable means extending through an opening in said handle and interconnecting said dogs for movement in unison, a series of stops on each of the legs of said movable jaw for selective engagement by said dogs to restrict the ply movement of said jaw to a minimum-gap, as determined by setting said dogs in advance of a selected stop in each of said series of stops, and spring means urging said dogs to any selected position in said series of stops, said spring means being yieldable upon operation of said manually operable means, so that said dogs may be moved clear of said series of stops.

5. A minimum-gap limiting wrench comprising in combination, a handle having an outwardly curved head at one end thereof, a movable jaw having legs straddling said handle and pivoted to the same at said curved head end and having a substantially flat work-engaging face confronting the curved face of said outwardly curved head for plying to and from the same by operation of said handle, dogs mounted for longitudinal sliding movement on opposite sides of said handle and means extending through an opening in said handle and interconnecting said dogs for movement in unison, a series of teeth on each of the legs of said movable jaw for selective engagement by said dogs, said teeth having faces so inclined as to block closing movement of said jaw when any of said teeth abut said dogs, and having opposite faces so inclined as to ratchet freely past said dogs during opening movement of said jaw, and spring means resiliently urging said dogs to engagement with said teeth.

6. A minimum-gap limiting wrench comprising in combination, a handle having a head at one end thereof, a movable jaw overlapping said handle and pivoted to the same at said head end for relative pivotal movement and having a work-engaging surface confronting a work-engaging face of said head so as to grip an object therebetween upon operation of said handle, a series of stops and co-acting manually retractable latch means on said handle and movable jaw to restrict closing movement of said jaw to a minimum-gap, as determined by setting said latch means in advance of a selected stop in said series of stops, spring means resiliently urging said latch means to any selected position in said series of stops, said spring means being yieldable, upon manual retraction of said latch means, so that said latch means may be moved clear of said series of stops, and means for locking said latch means in that retracted position in which it clears said series of stops.

LEONARD C. OSBORN.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
189,567	Mathews	Apr. 17, 1877
506,070	Plante	Oct. 3, 1893
728,945	Levy	May 26, 1903
891,683	Flowers	June 23, 1908
1,138,728	Cavanna	May 11, 1915
1,421,206	Galbraith	June 27, 1922