WRENCH FOR INSERTABLE TEETH IN SAWs


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38 Claims. (Cl. 76—80)

1. This invention relates to wrenches for insertable teeth in circular saws and more particularly to such wrenches by which leverage may be exerted to manipulate an insertable and removable tooth in a circular saw.

Circular disc saws for sawing large timbers and for cutting into boards are well known, as is also the fact that the teeth of said saws are separately removable and replaceable, the teeth being usually of crescent disc plates mountable in circular sockets in the peripheral edge of the saw disc or blade. These teeth are frequently chipped and broken in use and also must be frequently sharpened. The desirability of facility in removal and replacement is therefore obvious. Since the teeth must be firmly secured in the sockets, and since in use the resin of the wood hardens in the crevice between the tooth disc and the saw socket, a suitable and convenient wrench for manipulating the teeth in removal or replacement thereof is highly desirable.

The invention comprises a wrench for engaging and exerting leverage on a disc tooth in a rotary saw blade in which an extended handle for leverage is offset from the plane of the saw blade when the wrench is in engagement with the tooth. At one end of the handle is an integral retroverted flanged clevis-like hook at one side of the handle, the hook being turned perpendicular to the plane of the handle and having its terminal tongue end portion spaced parallel with the plane of the handle, the tongue and handle having aligned openings therethrough. On the opposite side of the handle adjacent the hook there is a spring loaded pin which passes through the hook openings and across the opening of the hook, the pin being adapted for passing through the eye in a saw tooth disc, and the retroverted flanged portion of the hook providing a fulcrum to engage in the inner arc of the crescent of the saw tooth for exerting leverage to rotate the outer arc of the crescent in a circular socket in which it is mounted. The pin is supported in a frame at said opposite face of the handle and the pin is actuated into engagement through the openings of the hook by a coil spring mounted on the shank of the pin. The pin is moved out of engagement with the walls of the hook by a pivotally mounted lifting lever mounted pivotally centrally intermediate the ends of the handle.

One form in which the invention may be exemplified is described in the specification herein and illustrated in the accompanying drawings in which:

Fig. 1 is a fragmentary side elevation of a saw blade illustrative of an application of the invention, showing the handle portion of the wrench in dotted lines.

Fig. 2 is a side edge view of the wrench of the invention.

Fig. 3 is a plan view of Fig. 1.

Fig. 4 is a fragmentary enlarged view of detail of a portion of Fig. 2, partly in section.

Fig. 5 is a plan view on line 5—5 of Fig. 4.

Referring to the drawings in which like reference characters indicate corresponding parts of the several views, 10 is a rotary circular disc saw blade having in its circumferential edge spaced sockets 11 which are open at the periphery of the saw disc, each socket being provided with an inverted V track 12. Into these sockets are mounted insertable and removable teeth disc 13 of crescent form and having the outer arc of the crescent circular and grooved to conform to the socket tracks 12. The inner arc of the tooth discs is usually irregularly arcuate as at 14. These tooth discs may integral include the tooth portion or may have the tooth portion 15 as a separately insertable and replaceable member, as shown in Fig. 1, in which event the tooth is provided with a shank 16 grooved at an arcuate edge similarly to the tooth disc, the tooth member being clamped in place in the saw blade socket by rotation of the tooth disc 13 on the track 12.

The tooth disc is usually provided with one or more holes 17 therethrough for engagement by a tool for tightening or loosening the tooth disc in its mounting. If desired, the tooth disc may also be provided with a slit 18 through its body to provide a degree of resilience in the clamping of an insertable tooth in the socket. The foregoing features of a circular wood saw blade are well known.

The difficulty to be overcome by the wrench of this invention is to provide a wrench manipulable with facility from the side face of the saw and within the outer periphery of a circular saw blade for tightly seating the tooth disc in the socket and in removing it to sharpen, repair, or replace the worn or damaged tooth.

The wrench of the invention comprises an elongated handle 20 of strong strip material having at one end a hand grip portion 21 and having at one side of its opposite or forward end a hook structure generally indicated 23 for engaging a saw tooth disc, as will be further described. Adjacent spaced from said forward opposite or hook end the handle strip has an offset in its plane at 22, so that the hand grip portion 21 is spaced from the planar face of a saw blade.
when the hook engages a tooth disc, whereby the fingers of the operator have ample space for manipulation without being injured against the planar face of the saw body. 

Promoting the offset 22 and the hook end 23 and adjacent to the latter the handle strip member is angular turned and preferably curved laterally from its alignment as at 24, whereby operation of the outer peripheral circumference of the saw blade and teeth, as shown in broken lines in Fig. 1. The hook 23 is formed at the terminal end of said curved or angularly turned portion by flanging the strip substantially perpendicularly upon itself as at 25, and retrotending the end of the flange again perpendicularly to provide a terminal tongue 26 which is in a plane substantially parallel with the plane of the curved portion 24 of the handle strip and spaced therefrom by end bridge flange 25 sufficiently to receive therebetween the tooth disc 19 of the saw. Each side wall of the hook member has a perforation there through indicated 27, 23 for receiving there through a lock pin bar 29. This hook is therefore a clevis-like member being U-shaped or horse shoe in form and having the bar of pin 29 across its opening. The pin bar 29 is reciprocable in the openings 27, 23 perpendicularly to the walls of hook 23 and is provided at the opposite face of the handle strip with an extended shank 30 of greater diameter which has fixedly mounted thereto a flanged shoulder 21 at its end adjacent the hook end and the bar 29 of the pin being normally urged through the perforations 27, 29 by coil spring 32 compressed by bearing at one end against the flanged shoulder 21 and bearing at its opposite end against the cross bar or plate 33 of a pin frame 24 which comprises a pair of relatively spaced parallel strips 34a which are upstandingly footed on the handle member at the side face of the handle member opposite the hook. The cross bar or plate 33 spaces the strips 34a at the outer end thereof, and is securely mounted adjacentely spaced from said outer end of the strips 34a by pins 35a through the strips 34a. The enlarged end portion of the shank of the pin passes snugly sidelybly through an opening 36 in the cross bar 33 of the frame and is guided thereby in stabilized alignment with perforations 27, 29, which are aligned with the opening 35. At the outer end of the pin shank beyond the cross bar of the frame, the pin is provided with a flattened head 36.

While the pin bar 29 is normally urged through the perforations 27, 29 responsive to the tension of coil spring 32, it must be retracted from the perforation 26 of the tongue 25 in order that the saw tooth disc may be inserted in the hook socket opening 31 for operation of the wrench in either inserting or removing the tooth disc in the saw socket. The means for removing the pin bar 29 from the perforation 27 comprises an elongated lifting lever 38 mounted along the handle strip and having one end portion 38a conveniently accessible to the operator's hand in gripping the hand grip portion 21 of the handle. Intermediate its length this lifting lever is pivotally fulcrumed at an upwardly position on the handle strip as at 35 and its opposite end is provided with a claw 40 which straddles and engages the pin 29 between the flanged shoulder 21 and the reverse face of the handle strip, the claw being normally maintained in contact with said adja-

cent reverse face of the handle strip by the tension of spring 32.

Upon manual pressure on the hand grip 38a of the lever simultaneously with gripping the hand grip of the handle, the pin bar 29 will be lifted free of the hook socket opening 31 for insertion of a tooth disc as shown in broken lines in Figs. 2 and 4. When the tooth disc is within the socket opening 31 of the hook, manual release of the lever 36 permits the coil spring 32 to urge the pin bar 29 through the openings 21 and 29 of the hook, whereupon the wrench is in position to move up or down parallel to the face of the saw blade to rotate the tooth disc on the axis of said disc and either tighten it or loosen it in its socket 11. The leverage moment arm of the wrench on the inner arc of the crescent tooth disc is from the pin bar 29 in the opening 17 to the inner face of hook flange 25 which bears against the edge of the inner arc of the tooth disc, as indicated 41 for tightening a tooth disc and indicated 41a for removing a tooth disc as shown in Fig. 1.

The head 35 of the pin frame 24 provides a means whereby the pin bar 29 may be forcibly driven through the opening 17 of the tooth disc in the event that the opening 17 becomes filled with hardened resin to such an extent that the compression of coil spring 32 is not sufficient to drive the pin bar through such opening, the head 35 having a diameter greater than the space between upright strips 34a and width of plate 33, so that if a forcible blow is struck upon the head for said purpose the thrust of the force will be by contact of the head upon the ends of side strips 34a rather than upon the crossbar member 33.

The laterally curved or angularly turned end portion 24, in the alignment of handle 20, adjacent to the hook 23, provides a handgrip handle portion 21 within the outer periphery of the plane of the blade and the teeth of a circular saw when the wrench is gripping a saw tooth, as shown in Fig. 1, and thus avoids the possible danger of injuring the hands of the operator against the sharp points of the teeth 15, which factor, taken in connection with the planar offset 22, greatly facilitates speed and safety of operation of the wrench.

Having described the invention what is claimed as new and patentable is:

1. A wrench for manipulating insertable disc teeth in peripheral sockets of circular saws, comprising a handle member having a handle grip portion at one end and having at its opposite end a hook at one side of the handle, said hook having a pair of spaced substantially parallel walls connected at one end by an end bridge flange therebetween providing a hook socket open at one end for receiving therein the disc plate of a saw tooth, and the hook sidewalls each having a relatively aligned perforation therethrough spaced from said end bridge, a pin having a bar portion reciprocable through said parallel walls and through a perforation of the saw tooth disc, and means for reciprocating said pin, said handle member having a lateral angular end portion adjacent to the hook end offsetting the hook from alignment with the hand grip portion of the handle, whereby the hand grip portion of the handle may be positioned within the outer periphery of a circular saw when the hook is engaged with a saw tooth at said periphery.

2. A device of the character described having
5 the elements of claim 1, and in which the handle has an offset in its plane intermediate the hand grip portion and the lateral angular turned portion of the handle.

3. A device of the character described having the elements of claim 1 and in which the means to reciprocate the pin includes a lever for lifting the pin, a pin frame mounted on the handle at the face of the handle opposite the hook and having a guide opening aligned with the perforations in the hook, the pin having a shank slidable passing through the opening in the frame providing a guide for the shank, and a coil spring mounted on the pin lifting lever and being under compression between the pin frame and the end of the shank adjacent the pin bar.

4. A device of the character described having the elements of claim 1 and in which the handle has an offset in its plane intermediate its ends, and the means to reciprocate the pin includes a lever for lifting the pin, a pin frame mounted on the handle at the face of the handle opposite the hook and having a guide opening aligned with the perforations in the hook, the pin having a shank slidable passing through the opening in the frame providing a guide for the shank, and a coil spring mounted on the pin shank and being under compression between the pin frame and the end of the lifting lever adjacent the pin bar.

5. A wrench for axially rotating a perforated disc saw tooth in a peripheral socket in a circular saw blade, comprising a handle member having a hand grip portion at one end and having at its opposite end an integral retroverted hook at one side of the handle, said hook having a pair of spaced substantially parallel walls connected at one end by an end bridge therebetween providing a socket open at one end for receiving therein the disc plate of a saw tooth, said hook walls each having a perforation relatively aligned therethrough and spaced from said end bridge, a pin having a bar portion reciprocable through said perforations and through the perforation of the saw tooth disc, spring means tensioned to urge the pin bar through said perforations and a lifting lever having one end portion extending along the hand grip portion of the handle and having its opposite ends engaging the pin for reciprocating the pin against the tension of said spring means, said handle member having a lateral angular end portion adjacent to the hook end offsetting the hook from alignment with the hand grip portion of the handle, whereby the hand grip portion of the handle may be positioned within the outer periphery of a circular saw when the hook is engaged with a saw tooth at said periphery.

6. A device of the character described having the elements of claim 5, and in which the handle has an offset in its plane intermediate the hand grip portion and the lateral angular turned portion of the handle.

7. A device of the character described having the elements of claim 5, and in which there is a pin frame mounted on the handle at the face of the handle opposite the hook and having a guide opening aligned with the perforations in the hook, the pin having a shank slidably passing through the opening in the frame providing a guide for the shank, and the spring means includes a coil spring mounted on the pin shank and being under compression between the pin frame and the end of the lifting lever adjacent the pin bar.

8. A wrench for manipulating insertable disc teeth in circular saws having the elements of claim 5, and in which the handle has an offset in its plane intermediate its ends, and there is a pin frame perpendicularly upstanding from the face of the handle opposite the hook and comprising a pair of parallelly spaced strips and a cross-bar adjacently spaced from the free end of the strips, said cross-bar having a guide opening therethrough aligned with the perforations of the hook, the pin having a shank slidably passing through said opening in the cross-bar providing a guide for the shank of the pin; and said spring means comprises a coil spring mounted on the pin shank and being compressible between said cross-bar and the end of the lifting lever which is adjacent to the pin bar.

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