Aug. 23, 1966 W. D. BEARD 3,267,973

CHAIN SAW BAR ADJUSTING DEVICE

Filed June 1, 1964 2 Sheets-Sheet 1

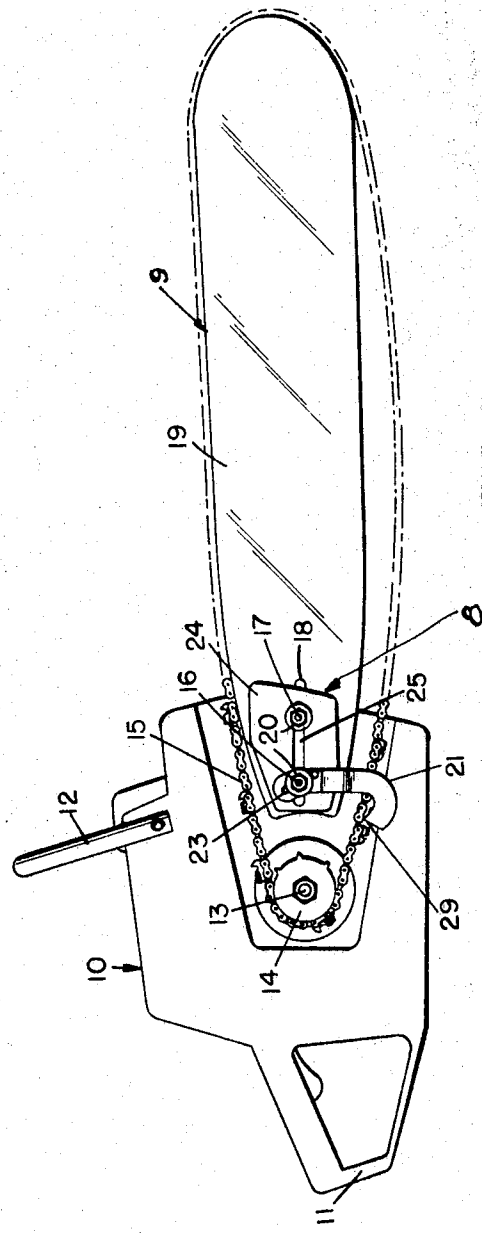


Fig. 1

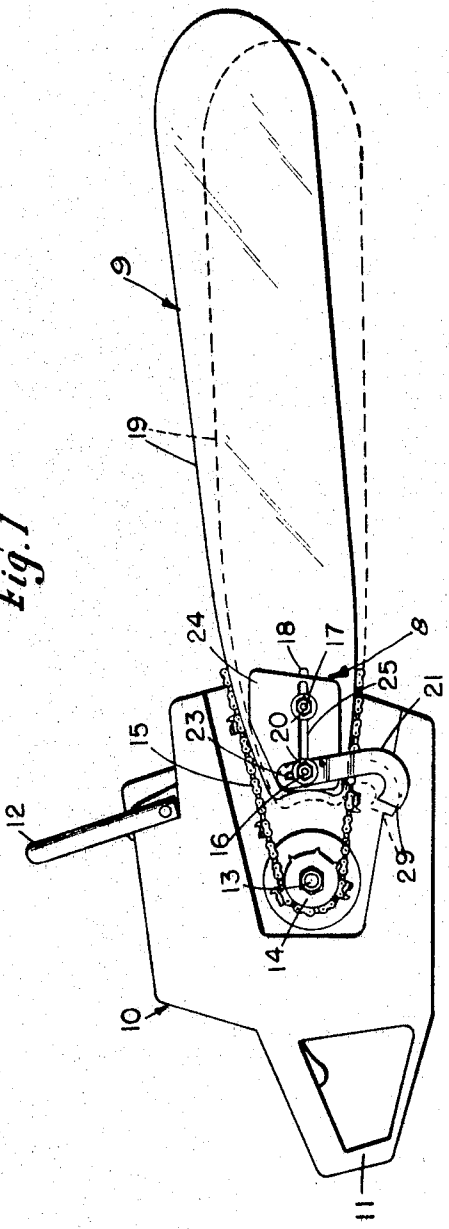


Fig. 2

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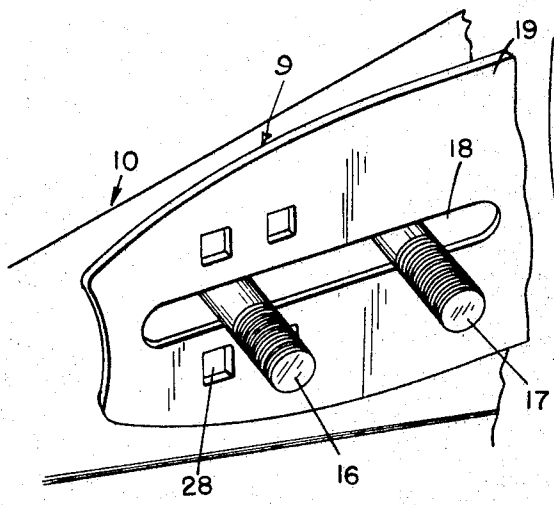


Fig. 3

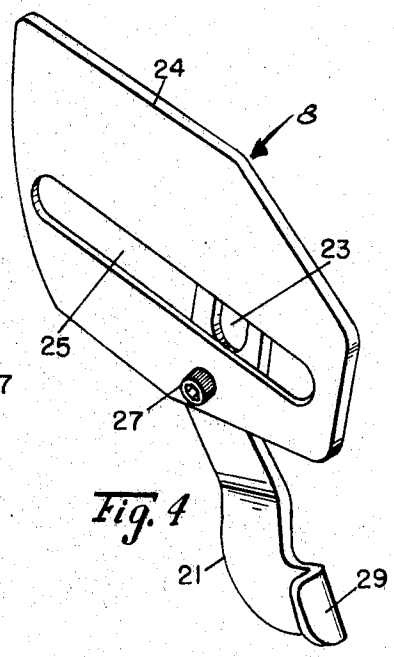


Fig. 4

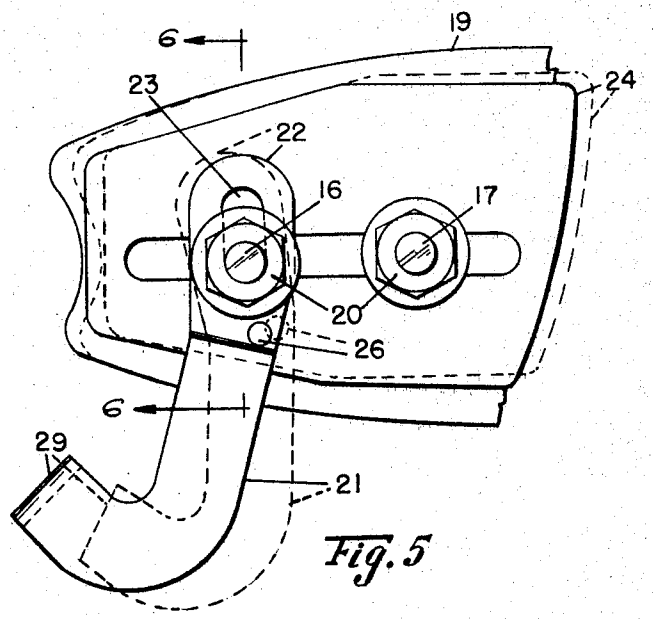


Fig. 5

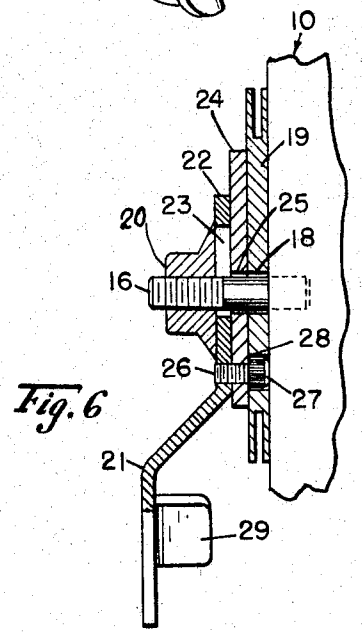


Fig. 6

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3,267,973

# CHAIN SAW BAR ADJUSTING DEVICE

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5 Claims. (Cl. 143—32)

This invention relates to chain saws and more particularly to a device for adjusting a guide bar within a chain saw to assure that the endless chain which forms the cutting blade of the saw is properly tensioned and tightened.

Chain saws have achieved wide spread usage in the lumber and logging industry because of their ease of operation, light weight, and their extreme versatility in wood severing operations. Such chain saws customarily include a lightweight driving motor, such as a small gasoline engine, an elongated guide bar extending away from the motor, and an endless articulated chain carrying spaced teeth thereon and serving as the cutting blade for the saw. The chain is designed to track peripherally of the guide bar and to have one end thereof looped over a sprocket which is driven by the motor. Thus, when the motor is operated, the sprocket drives the chain and causes it to traverse along the guide bar and to thereby perform the desired sawing or severing operation.

It has been found that when a chain saw of the type previously described is used over a period of time, the chain tends to stretch or elongate to such a degree that it no longer travels contiguously to the guide. As a result, the chain becomes slack and has a tendency to jump off the track along the periphery of the guide bar. Naturally, such a saw is unsafe to operate, until the chain is once again tensioned for its desired tracking along the guide bar. Since it can, therefore, be seen that the chains on such saws must be periodically adjusted or tensioned, it should be obvious that it would be both useful and beneficial to provide a means or device for accomplishing such adjustment.

Heretofore, attempts have been made in the prior art to provide such a device, but these attempts have generally taken the form of a screw adjustment mechanism, which can be engaged by a screw driver or wrench and turned to cause the guide bar to move forward to take up the slack in the chain. Exemplary of such prior art devices are those disclosed in U.S. Patents 2,624,379 and 2,765,821. While these devices do produce a tensioning of the chain, they, nontheless, have certain attendant shortcomings which can be beneficially eliminated. For example, to operate the screw adjustment devices of the prior art, a special tool is needed and the tool must be manually operated with the handle in close proximity to the chain itself. The highly sharpened teeth of the chain saw present a safety hazard, since the operator's hand can be easily cut thereby while performing the adjustment. Also, in all chain saws, the guide bar is mounted by lock nuts which must be loosened before adjustment can be effected. In the loosening of such nuts, the forward or outermost end of the guide bar tends to drop or sag. Thus, in order to properly adjust the tension on the chain, it was necessary in these prior art devices to manually lift the forward end of the guide bar and to hold it in an elevated position, during the adjustment operation. It is apparent that this necessitated some difficult manual manipulations during adjustment, and it further presented the likelihood that the operator's hand could contact and be injured by the chain. Finally, the prior art adjustment devices for chain saws are somewhat slow and cumbersome in their operation.

With the foregoing in mind, it is, therefore, an object of the present invention to overcome any shortcomings associated with the prior art and to provide in lieu thereof an improved device for adjusting a guide bar in a chain



saw to assure that the cutting chain thereof is properly tensioned.

Another object is to provide an adjustment means for tightening the chain in a chain saw, wherein the means can be pedally, as well as manually, operated.

A further object is the provision of a device for adjusting a guide bar in a chain saw, which includes a safety shield to protect the operator in the event the chain should be disengaged from the guide bar.

Still another object is to provide a device for adjusting a guide bar in a chain saw, which will simultaneously elevate and extend the guide bar to properly tension the chain of the saw.

Further objects of the present invention include the provision of a chain saw adjustment device which is compact and inexpensive; which can be easily and quickly operated by hand or by foot; which is durable and rugged enough to stand protracted and rough usage; and which is of exceedingly simple and efficient design.

These and other objects, advantages and salient features will become apparent as the following specification is considered with the accompanying drawings, wherein

FIGURE 1 is a side elevational view of a chain saw embodying the adjusting device and illustrating the chain in a slack position;

FIGURE 2 is a side elevational view, similar to FIGURE 1, but showing the adjusting device in operative position to tension the chain and remove the slack therefrom;

FIGURE 3 is a fragmentary perspective view of the rear end of the chain saw guide bar, and illustrating its manner of mounting;

FIGURE 4 is a perspective view of the inner surface of the adjusting device;

FIGURE 5 is a side elevational view of the adjusting means of FIGURE 4 coupled to the guide bar of FIGURE 3; and

FIGURE 6 is a transverse sectional view, taken substantially along the line 6—6 of FIGURE 5.

Referring more particularly to the drawings, wherein similar reference characters designate like parts throughout the several views and as best seen in FIGURES 1 and 2, there is provided an adjusting means or device generally designated 8, which is designed to move a guide bar generally designated 9, movably mounted upon a frame 10. The latter customarily forms a portion of a housing in which a gasoline engine, or the like, is suitably disposed.

The frame 10 includes an integral rear hand grip 11 and a pivotal upper hand grip 12, which allows an operator to properly hold and position the chain saw during operation thereof. A drive shaft or spindle 13 projects laterally from the frame 10 and has mounted upon its outer end a conventional chain sprocket 14. The chain sprocket is designed to accommodate a saw chain 15, which forms the cutting blade of the saw. As is conventional, the chain 15 is an articulated endless belt or loop having spaced teeth thereon. When the motor is operated to cause the sprocket 14 to rotate, the chain 15 is driven peripherally along a track or groove in the edge of the guide bar 9.

As can best be seen in FIGURES 1 and 2, and in greater detail in FIGURES 3 and 5, a pair of spaced threaded studs 16 and 17 extend in aligned relationship from the frame 10 forwardly of the sprocket 14. The purpose of these studs is to provide a means for mounting the guide bar 9 to the frame 10. The guide bar itself is an elongated flat blade member 19 having its rounded forward end and a slot 18 adjacent its rearward end. The slot 18 is designed to fit over the studs 16 and 17, as shown in FIGURE 3, and, after the adjusting means

8 is similarly disposed over the studs, as hereinafter described, a pair of locking or clamping nuts 20 may be threaded onto the studs to retain the parts in their proper relationship. It will be appreciated that the chain 15 has its forward end looped over the rounded forward end of the guide bar 19 and its rearward end looped over the sprocket 14. That portion of the chain between its ends is to fit contiguously to the periphery of the guide bar 19. This is accomplished by sliding the guide bar forwardly until the chain is properly tensioned into peripheral tracking contact with the guide bar 19. At this point, the nuts 20 are tightened to prevent the slot 18 from slidably moving along the studs 16 and 17, which locks the guide bar against movement.

The adjusting device 8 is provided to perform the desired movement of the guide bar 19. As such, the device 8 includes a lever 21 having an upper end 22 with a short slot 23 extending longitudinally thereof. Also included in the device 8 is a flat plate member 24, formed with an elongated slot 25 therein, corresponding substantially in size and shape to the guide bar slot 18. The lever 21 and plate member 24 are pivotally attached to one another by a pivot pin 26 having an enlarged projecting head 27. The location of the pivot point is beneath the slots 23 and 25 and serves to connect the members of the adjusting device 8 so that the lower end of the slot 23 is substantially aligned with the lower edge of the slot 25, when the lever 21 is in its normal position, as best seen in FIGURE 4. The head portion 27 of the pivot pin 26 is disposed on that side of the plate member 24 opposite to the side on which the lever 21 is mounted.

In assembling the adjusting device 8 on the chain saw, the plate member 24 is positioned with the lever 21 facing outwardly and is juxtaposed to the rear end of the guide bar 9. This is accomplished by placing the slot 25 parallel to the slot 18 and slipping it over the studs 16 and 17. Lever slot 23 is aligned so it too receives the stud 16. A shaped recess or aperture 28 is formed within the guide bar 19 beneath the slot 18 to receive and accommodate the enlarged head 27 of the pivot pin. In normal assembly, the parts assume the position of FIGURE 6, wherein the guide bar 19 abuts against the frame 10, the plate member 24 abuts the guide bar, and the nut 20 on the stud 16 abuts the lever 21, while the nut 20 on the stud 17 engages the plate member 24. When the nuts 20 are tightened, the parts are rendered immovable and no adjustment can occur. In this condition, the chain 15 should ride contiguously along the periphery of the guide bar 19 and should thus provide the desired cutting or sawing action. However, after continued sawing operations, the chain tends to stretch or elongate and thereby assumes the slack position of FIGURE 1, wherein it hangs away from the guide bar 19. When this occurs, the adjusting device 8 must be operated to move the guide bar 19 to a position wherein the chain 15 once again fits contiguously to its periphery and tracks therealong under tension.

To operate the adjusting device 8 and thereby tighten the chain 15, the nuts 20 are initially loosened to permit of the guide bar being moved relatively to the frame 10. Lever 21 is then engaged and moved forwardly by either the hand or foot of the operator. This movement is facilitated by providing the lower end of the lever 21 with an inwardly extending ear 29 which serves as an engagement surface. As forward pressure is applied to the ear 29, the upper end 22 of the lever is pivoted toward the rear end of the guide bar 19. However, as the slot 23 surrounds the fixed stud 16 it acts to resist any rearward movement of the upper end 22. Consequently, as such rearward movement is attempted, the stud abuts against the lower forward edge of the slot 23, which serves as the pivot point. Thus, the lower pivot pin 26 is shifted forwardly, during continued pivoting pressure to the ear 29. As the pivot pin 26 moves, its head portion 27 moves within the recess 28 to thus move the entire guide bar 19



in a forward and slightly upward direction. If the pivoting pressure continues to be applied to the lever 21, the stud gradually rides along the forward edge of the slot 23 from the lower end to the upper end thereof. Simultaneously, the guide bar is forced further forwardly and upwardly by action of the head 27 within the recess 28. It will thus be appreciated that merely by applying a pivoting force to the lever 21, the guide bar 19 will be moved from the position shown in dotted lines in FIGURE 2 to that position shown in solid lines therein. As the guide bar moves, it takes up the slack in the saw chain 15 and assures that the chain will track contiguously to the bar periphery. with the proper amount of tension. When the bar 19 has been properly adjusted, the nuts 20 are again tightened.

It should be apparent that the extreme simplicity of the adjustment device 8, having only two moving parts pivotally attached to one another, in no way hampers its efficiency, or its ability to quickly and easily adjust the guide bar 19 to its desired position. After the nuts 20 are loosened, the adjustment can be performed by hand, but it may be performed by foot to eliminate the possibility of cutting a hand on the sharpened saw chain 15. Since the pivoting force applied to the lever 21 is translated into both a forward and an upward movement of the guide bar 19, it is unnecessary to manually raise the forward end of the bar and, hence, the hands of the operator are free to hold the saw and to quickly manipulate the nuts 20 with a wrench, in an obvious manner. Finally, it will be noted that the lever 21 depends beneath the bottom of the guide bar 19 and, in this position, it will serve as a safety shield, in the event the chain 15 should accidentally be disengaged from or jump off its track in the guide bar periphery.

While I have shown and described a preferred form of my novel saw adjusting means, it is to be understood that various changes and improvements may be made therein, without departing from the scope and spirit of the appended claims.

What I claim is:

1. For use in combination with a chain saw having a frame with a pair of spaced laterally extending studs, a guide bar having an elongated slot at its rear end for slidably receiving said studs, a saw chain extending peripherally along said guide bar, and locking nuts mounted upon said studs to clamp said guide bar to said frame, an adjusting device interposed between said guide bar and said locking nuts for selectively shifting said guide bar in a chain tightening direction, said adjusting device comprising

a plate member having an elongated slot therein similar to said guide bar slot,

an adjusting lever having a slot at one end and an engagement surface at its other end, and

means pivotally connecting said adjusting lever and said plate member to each other with their respective slots at least partially overlying and intersecting one another,

said adjusting device being mountable upon said chain saw with one end of said studs extending through said plate member and said adjusting lever slots,

said means engaging said guide bar for movement thereof when said adjusting device is mounted upon said chain saw,

said adjusting lever being pivotable in response to an actuating force applied to its engagement surface to thereby move said means and cause said guide bar to move both forwardly and upwardly to tighten said saw chain.

2. An adjusting device as defined in claim 1, wherein said means includes a pivot pin extending through said plate member and said adjusting lever beneath their respective slots, said means having an enlarged head projecting beyond said plate member on the side thereof opposite said adjusting lever.

3. An adjusting device as defined in claim 2, wherein said guide bar has a shaped recess therein, and said enlarged head is disposed within said recess and is engageable with at least part of the walls thereof upon actuation of said adjusting lever to thereby allow said head to move said guide bar in its desired adjustment direction.

4. An adjusting device as defined in claim 1, wherein said lever engagement surface projects beyond the periphery of said guide bar when said adjusting device is mounted upon said chain saw to thereby act as a safety shield should said chain become disengaged from its track.

5. An adjusting device for use in combination with a chain saw of the type having at least two spaced stud bolts projecting laterally from its frame, a guide bar having an elongated slot at one end thereof with said stud bolts being disposed therein to allow said guide bar to be moved relatively to said frame for adjustment thereof, a saw chain disposed peripherally of said guide bar and adapted to operate in tight tracking engagement with the edge thereof, and lock nuts engageable with said studs to attach said adjusting device to maintain said guide bar in its adjusted position, said adjusting device comprising:

a plate member having an elongated slot therein for receiving said stud bolts when said plate member is juxtaposed to the slotted end of said guide bar,

an adjusting lever having a slot at its upper end and an engagement surface at its lower end,

said adjusting lever having an aperture disposed between said slot and said engagement surface,



said plate member having a similar aperture disposed beneath its elongated slot, and

a pivot pin extending between said adjusting lever and said plate member apertures for pivotally attaching said adjusting lever to the side of said plate opposite to that side which is juxtaposed to said guide bar,

said pivot pin having a head portion projecting beyond said plate member on its guide bar side,

said guide bar having a recess aligned with said pivot pin head for reception and accommodation thereof,

said adjusting lever slot having one of said stud bolts extending therethrough,

said adjusting lever engagement surface depending beneath the lower periphery of said guide bar to serve as a safety guard for said saw chain,

said adjusting device being operable upon loosening of said lock nuts to move said guide bar in a chain tightening direction,

said guide bar movement being effected by application of an actuating force to said engagement surface to pivot said lever whereby said guide bar is moved to a position wherein said chain saw properly engages its periphery.

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DONALD R. SCHRAN, *Primary Examiner.*