Nov. 17, 1959 E. R. NIELSEN 2,913,020

FORCE-FEED LUBRICATED CHAIN SAW BAR UNIT

Filed July 31, 1958

Fig. 1

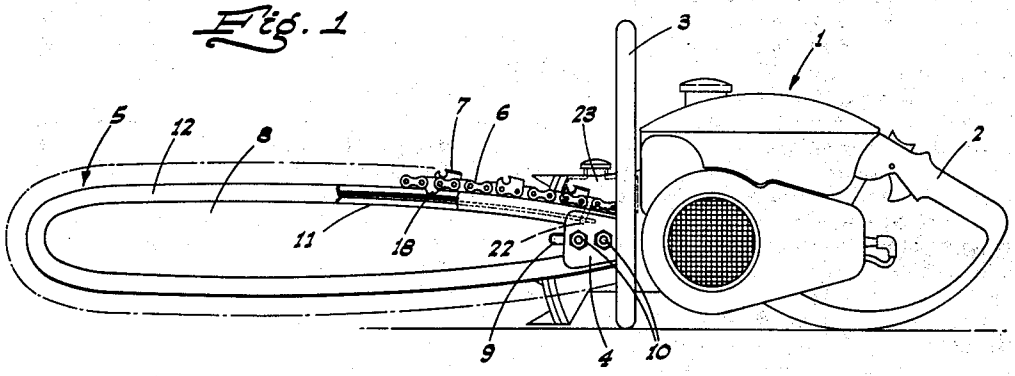


Fig. 2

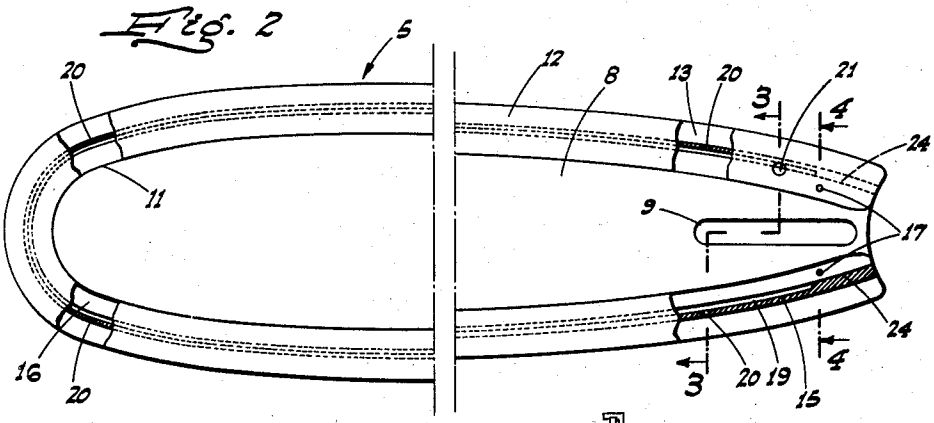


Fig. 3

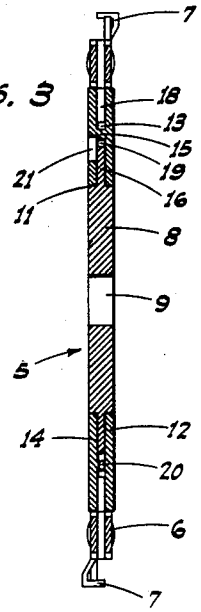
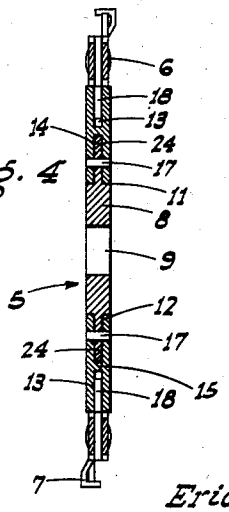


Fig. 4



INVENTOR.
Erick R. Nielsen
BY Webster & Webster
ATTYS.

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FORCE-FEED LUBRICATED CHAIN SAW BAR UNIT

Erick R. Nielsen, Stockton, Calif.

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5 Claims. (Cl. 143—32)

This invention relates in general to an improvement in the bar unit of a power driven, portable, chain saw; such saw being of the type which includes an endless cutter chain running on the periphery of said bar unit.

A major object of the present invention is to provide a chain saw bar unit constructed in a novel manner so that lubricating oil is fed to the endless cutter chain at a plurality of points in the length thereof whereby to assure of positive and effective lubrication of the cutter chain in the complete travel thereof on said bar unit.

Another important object of this invention is to provide a chain saw bar unit which includes a novel guide rail for the endless cutter chain; such guide rail, in connection with a part of the bar, comprising the structure employed to accomplish the multiple point feed of the lubricating oil to the endless cutter chain.

An additional object of the invention is to provide a guide rail, as in the preceding paragraph, which is an initially separate member secured to the bar for ready removal at such time as it becomes necessary to replace the rail because of wear or damage. This avoids the need of replacing the entire bar unit and as a consequence a substantial economy is effected.

A further object of the invention is to provide novel means for removably securing the guide rail to the bar.

It is also an object of the invention to provide a chain saw bar unit which is designed for ease and economy of manufacture.

Still another object of the invention is to provide a practical, reliable, and durable chain saw bar unit, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side outline of a portable chain saw fitted with the improved bar unit; the latter being partly broken away and partly in section.

Fig. 2 is a side elevation of the bar unit, detached; the view being partly broken away and partly in section.

Fig. 3 is a cross section taken on line 3—3 of Fig. 2.

Fig. 4 is a cross section taken on line 4—4 of Fig. 2.

Referring now more particularly to the drawings, and to the characters of reference marked thereon, the numeral 1 indicates a conventional engine and drive unit of a portable or hand-supported type of chain saw; such engine and drive unit 1 including a rear handle 2, a front handle 3, and a forwardly projecting mounting or attachment block 4.

A chain saw bar unit, indicated generally at 5, is fixed in rigid connection with the attachment block 4 and projects forwardly therefrom; such bar unit 5 providing the supporting and guide medium for an endless cutter chain 6 which includes outwardly projecting cutter teeth 7. For a major portion of its length the endless cutter chain 6 travels on said bar unit and at its rear

end such chain is driven by suitable and conventional mechanism (not shown) but which includes a drive sprocket within the confines of the engine and drive unit 1.

The chain saw bar unit 5, which embodies the essence of the present invention, is comprised of a longitudinal, forwardly projecting bar 8 which is flat-sided, relatively thin transversely, and of generally elliptical form in side elevation.

The general shape of the bar 8 is substantially conventional and such bar includes—at the rear end—a longitudinal, open-ended slot 9 for the reception of bolts 10 which secure said bar 8 to the mounting or attachment block 4. The outer or peripheral edge 11 of the bar 8 terminates at its rear ends above and below the slot 9, but between such ends extends unbroken or continuous about the entire length of said bar 8.

A continuous guide rail 12 seats on the peripheral edge 11 of bar 8 for the full length of said edge and in matching relation thereto. Such guide rail 12 is of generally elliptical form but is open at the rear end; the rail being made of a metal which permits said rail to be snap-engaged onto the bar 8 from its forward end.

Such guide rail 12 is properly located on, and effectively detachably secured to, the bar 8 as follows:

In cross section the guide rail 12 is H-shaped, whereby to provide a continuous outwardly opening channel 13; a continuous inwardly opening channel 14; and a central dividing web 15 between such channels 13 and 14.

A continuous longitudinal tongue 16 is formed integral with the bar 8 and projects outwardly centrally between the sides of said bar; such tongue 16 engaging in relatively close fitting relation in the inwardly opening channel 14 of the guide rail 12, whereby to effectively locate the latter on said bar 8.

Cross pins 17 extend through the guide rail 12 and the tongue 16 adjacent but short of the ends of said rail, whereby to secure said rail and the bar 8 against relative longitudinal displacement; lateral displacement of the rail being prevented by the tongue 16 engaged in channel 14. The cross pins 17 can be driven out for the purpose of removal and replacement of said guide rail 12.

The endless cutter chain 6 includes, at longitudinally spaced points in the length thereof, inwardly extending guide fins 18; the chain traveling on the peripheral edge of the guide rail 12 with the fins 18 running in the outwardly opening channel 13 of said rail. In order to prevent undue wear on the endless cutter chain 6 it is requisite that such chain be lubricated. Heretofore it has been a common practice to merely feed a lubricating oil to the cutter chain at a single point, usually near where the chain first engages the bar unit; the travel of the chain then having been relied upon to deliver the lubricating oil all about the bar unit. However, frequently the oil did not adequately distribute about the bar unit, with the result that the cutter chain—particularly in the lower course or run—starved for oil, and thus was subject to undue wear.

With the present invention proper and effective lubrication of the cutter chain for the full length of its travel on the bar unit 5 is assured, and this is accomplished as follows:

The continuous tongue 16 is of lesser height than the depth of the inwardly opening channel 14, whereby to define—in the rail 12—a continuous, lubricating oil feed passage 19; there being a plurality of longitudinally spaced orifices 20 in the central web 15—throughout substantially its entire length—to thus establish multiple points of communication between said passage 19 and the outwardly opening channel 13 in which the guide fins 18 run.

On one side, adjacent the top and rear of the bar

unit 5, the guide rail 12 is formed with a port 21 which communicates with the passage 19; such port, when the bar unit 5 is mounted on the engine and drive unit 1, registering with a port 22 in the mounting or attachment block 4, and to which port 22 lubricating oil is fed under pressure from a supply tank 23 on said unit 1. The latter includes—conventionally—a lubricating oil feed pump (not shown) interposed between the tank 23 and the port 22.

With lubricating oil fed under pressure to the port 22, and thence through the port 21 and into the passage 19, such oil delivers or feeds through all of the orifices 20 into the outwardly opening channel 13, whereby to effectively and positively lubricate the cutter chain 6, including the guide fins 18, throughout the entire path of travel of said chain on the bar unit 5.

In order to prevent escape of any of the lubricating oil from the ends of the feed passage 19—i.e. at the rear end of the bar 8—the central web 15 is increased in depth, as at 24, to an extent sufficient to abut the adjacent edge of the tongue 16, which provides an effective closure at said ends of passage 19.

With the chain saw bar unit 5 constructed as described, not only is proper lubrication of the cutter chain 6 assured all along the path of its travel, but additionally the guide rail 12 can be readily removed for replacement when necessary.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A chain saw bar unit, for a driven endless cutter chain, comprising an elongated bar having a peripheral edge, a continuous guide extending along such edge, the guide supporting the cutter chain, said guide being H-shaped in cross section whereby to provide an outer channel and an inner channel separated by a web, the cutter chain including elements running in the outer channel, a continuous member on said edge of the bar projecting in closing relation into the inner channel but terminating short of the web whereby to define an internal passage in the guide, spaced orifices in the web communicating between the internal passage and the outer channel, and the guide being adapted for the introduction of lubricating oil into such passage.

2. A chain saw bar unit, as in claim 1, in which the web is inwardly increased in thickness adjacent the ends of said edge whereby to abut said member and block the passage at corresponding ends.

3. A chain saw bar unit, for a driven endless cutter chain, comprising an elongated bar having a peripheral edge, a continuous guide rail symmetrically engaging and extending along such edge, the guide rail being H-shaped in cross section whereby to provide an outwardly opening channel and an inwardly opening channel separated by a web, the guide rail supporting the cutter chain and the latter including elements running in the outer channel, a continuous longitudinal tongue on the bar centrally between the sides of and projecting outwardly from said edge into the inwardly opening channel in close fitting relation transversely of said rail, the height of the tongue being lesser than the depth of the inwardly opening channel so as to define a continuous passage between the tongue and said web, the latter having a plurality of longitudinally spaced orifices therethrough, closure means for the passage at the rear end of the bar, and means adapted to introduce lubricating oil into the passage at a predetermined point.

4. A chain-saw bar unit comprising an elongated bar provided with a peripheral edge having separated ends at the rear end of the bar, a continuous chain supporting and guide rail separate from the bar symmetrically engaging and extending along said edge from end to end thereof, a lubricant channel feeding at spaced points in its length to the chain being formed between said edge and the adjacent face of the rail, the rail being detachable from the bar by lengthwise movement of the rail away from said rear end of the bar, and means removably securing the rail and bar together.

5. A chain-saw bar unit comprising an elongated bar provided with a peripheral edge having separated ends at the rear end of the bar, a continuous chain supporting and guide rail separate from the bar symmetrically engaging and extending along said edge from end to end thereof, a lubricant channel feeding at spaced points in its length to the chain being formed between said edge and the adjacent face of the rail, the rail being detachable from the bar by lengthwise movement of the rail away from said rear end of the bar, said peripheral edge of the bar being of generally elliptical form and the rail being of resilient material to permit of snap-engagement of the rail onto the bar, and means detachably connecting the bar and rail adjacent the ends of the latter.

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