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CHAIN SAW CONSTRUCTION

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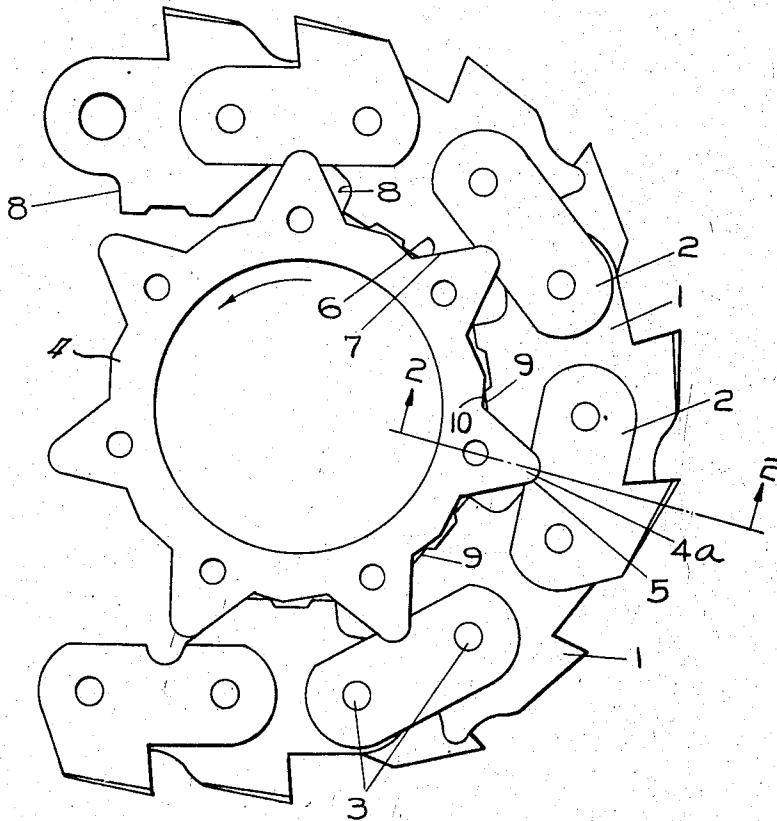


Fig. 1.

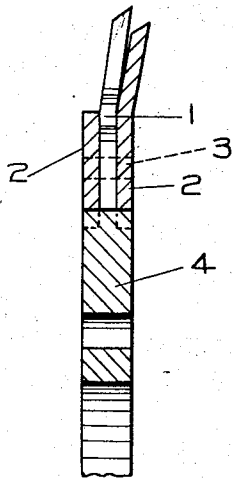


Fig. 2.

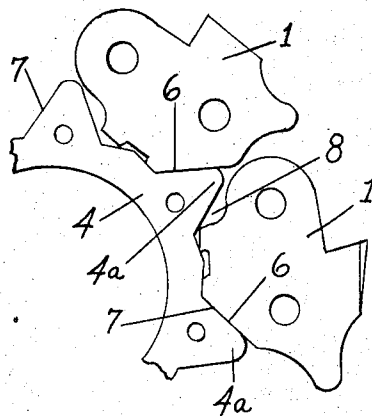


Fig. 3.

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CHAIN SAW CONSTRUCTION

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2 Claims. (Cl. 143—135)

The present invention relates to chain saws and particularly to a drive sprocket and chain construction by which to obtain a positive and substantially friction free drive for the saw chain.

In prior devices of this character, the driving element has been provided with rollers or pins for engagement with the saw, as shown for example in the Arsneau Patent No. 2,060,547. While in the patented construction, the driving element is adapted to have line contact with the saw chain, the contact between the sprocket and the chain is relatively small and the wear on the parts is excessive. One of the principal objects of the present invention is to provide a sprocket and chain, so arranged that the sprocket has flat driving surfaces of substantial area in contact with corresponding flat surfaces on the links of the chain, and with these surfaces so positioned that there is no frictional drag between the chain and sprocket as the chain is engaged by the sprocket.

In the Brown et al. Patent No. 596,802, the driving element is provided with notches to receive inwardly extending lugs formed on the outer links of the chain, and between the notches the element engages with the inner links to support the chain at a predetermined distance from the axis of the element. One serious objection to a drive of this character is that the chain is not supported solidly against rocking where it engages the driving element, and the saw has a tendency to twist and bind. A further feature of the present invention resides in providing a sprocket which, while providing a positive drive for the saw chain, also supports the chain by engagement with the outer links in such a manner that the chain has no tendency to twist or rock on the sprocket, and will always be held at a predetermined radial distance from the axis of the sprocket.

Other and further objects and advantages of the invention will hereinafter appear from the following detailed description taken in connection with the accompanying drawing, in which—

Fig. 1 is a side elevation of the sprocket embodying the invention, with a saw chain in position on a part thereof.

Fig. 2 is a sectional view along the line 2—2 of Fig. 1, looking in the direction of the arrows.

Fig. 3 is a fragmentary view of the chain with the outer links removed.

With reference to the drawing, the saw chain is made up of inner links 1 pivotally connected by outer links 2, with pins 3 providing a pivotal connection between the links to permit the chain

to flex around the sprocket 4. The latter, as will be understood, is suitably attached to a drive shaft, not shown, and the saw chain is driven by the sprocket as the latter rotates in the direction of the arrow.

Each of the outer links 2, as shown, is centrally notched, as at 5, to receive and to engage with the outer end of the teeth 4a of the sprocket, and these outer links, by engagement with the sprocket teeth, tend to support the saw chain in a predetermined radial position with respect to the sprocket, as it will be apparent that the chain cannot move radially inwardly on the sprocket while the links are in engagement with the teeth. The outer links, being spaced apart thus have a substantially broad surface contact with the ends of the sprocket teeth and twisting or sidewise rocking of the chain on the sprocket is prevented.

The rearward face of each of the inner links 1 has a flat angularly disposed surface 6, the position of which, when the chain is wrapped around the sprocket, is precisely parallel to and in engagement with the leading flat driving surface 7 of a sprocket tooth and in a position to engage with the tooth 4a substantially over the entire length thereof, as shown in Fig. 1. It will be obvious that the inner link surfaces 6 are proportioned accurately with respect to the notches 5 so that as the chain flexes around the sprocket the sprocket teeth surfaces 7 will still engage the surfaces 6 while the points thereof engage with the notches 5 in the outer links.

The forward lower corner of each inner link 1 is cut away, as at 8, so that there is no engagement between the rearward surface of each sprocket tooth and the following inner link, so that any frictional drag on the sprocket or chain from the non-driving surfaces of the sprocket teeth and chain links is avoided. It will be noted, however, that the inner edge of each inner link 1 may have a relatively small flat surface 9 intersecting with the surface 6 and in position to engage with the corresponding surface 10 on the sprocket.

It will be understood that the angularity of the surfaces 6 and 7 on an inner link and on the sprocket respectively is such that the angular thrust exerted on the link by the sprocket tooth does not tend to urge the teeth outwardly with respect to the sprocket, but transmits practically all of the driving power tangentially of the sprocket, as will be apparent. The driving surface 7 on the leading face of each sprocket tooth preferably extends at an angle of approximately

30° to a diametrical line passing centrally through the tooth.

I claim:

1. A chain saw construction, comprising in combination a rotatably mounted sprocket having radial teeth each providing a flat driving surface adjacent one end thereof, and a chain saw cooperating with said sprocket comprising a series of inner links pivotally connected on opposite sides by series of outer links arranged in pairs, with each of said inner links having a portion receivable between adjacent teeth of the sprocket, and providing a flat end surface closely engageable with the leading flat driving surface of a sprocket tooth when the chain is curved around the sprocket for driving the same, and with the forward edge of the next succeeding inner link of the chain being cut away to avoid engagement with the trailing face of a sprocket tooth, each pair of links in said outer series providing aligned notches in their lower edges to engage with the end of a tooth of said sprocket, for supporting the chain radially of the sprocket

axis, and to prevent rocking of the chain on a sprocket, as the chain is driven by the engaged flat surfaces of a sprocket-tooth and inner link.

2. A chain saw construction, comprising in combination a rotatably driven sprocket having radial teeth each providing a flat driving surface and a chain saw cooperating with said sprocket comprising a series of inner links pivotally connected on opposite sides by series of outer links arranged in pairs, with the combined widths of an inner link and two outer links substantially equal to the width of a sprocket tooth, each pair of outer links providing aligned notches in their lower edges to engage with the end of a tooth of said sprocket to support the chain radially of the sprocket axis and thereby prevent rocking of the chain on the sprocket, and with each inner link providing a flat driving surface in complete face-to-face engagement with the leading flat driving surface of a sprocket tooth when the chain is curved around the sprocket.

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