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W. VUTZ

2,278,393

METHOD OF MAKING GUARDS FOR RECIPROCATING KNIVES

Filed Jan. 26, 1940

FIG 1

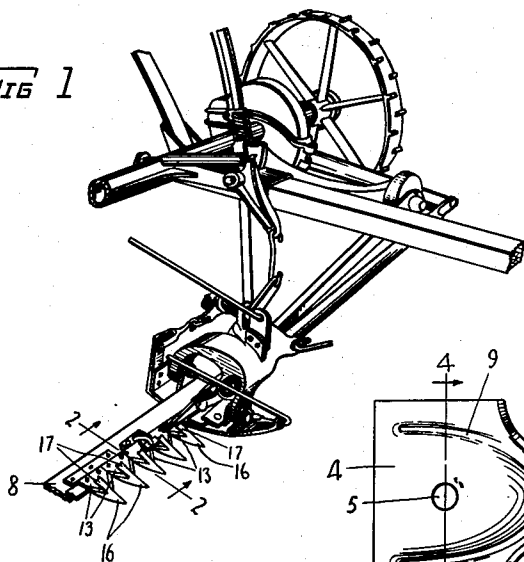


FIG 2

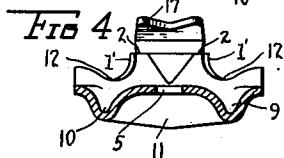
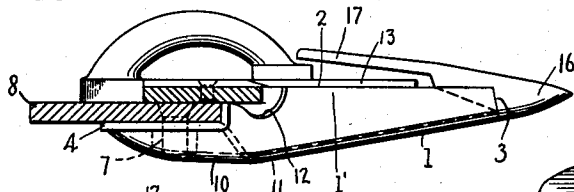


FIG 8

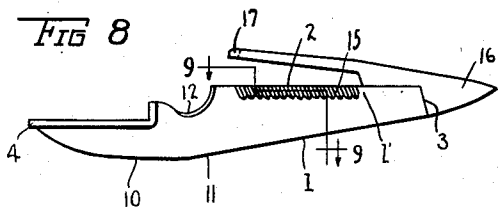


FIG 3

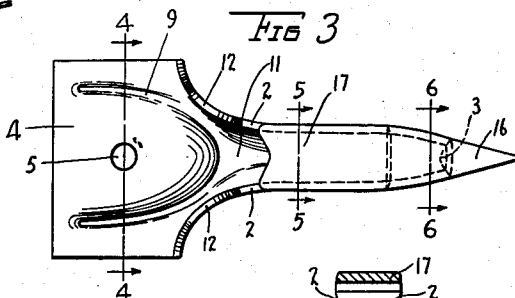


FIG 5

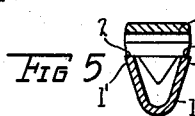


FIG 6



FIG 7

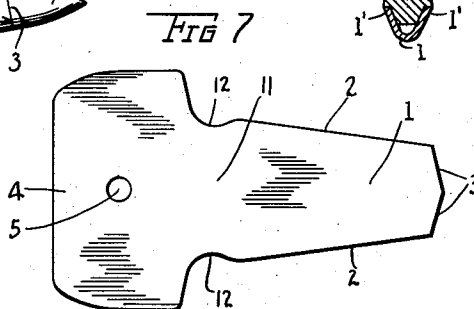
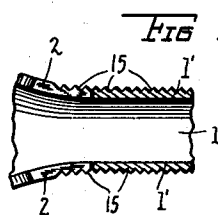


FIG 9



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UNITED STATES PATENT OFFICE

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METHOD OF MAKING GUARDS FOR
RECIPROCATING KNIVES

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2 Claims. (Cl. 29—148.3)

This invention relates to a guard for reciprocating cutters and the method of making the same; the invention relating more particularly to a guard finger for the reciprocating cutter of a mower, although not necessarily confined to that particular machine.

In the great majority of guards for the reciprocating knife of mowers, or other machines, such as binders or combined harvester threshers, they are at the present time generally made from cast malleable iron with a steel ledger plate riveted or otherwise secured to the body of the guard to provide a hard and lasting cutting edge to cooperate with the reciprocating knife. These cast guards are made as light as is consistent with the strength requirements of a guard under normal operating conditions. Under exceptionally hard cutting conditions, especially in stony fields, however, cast malleable guards often prove unsatisfactory as such guards are easily bent and in straightening will fracture and break. In an attempt to overcome these objections however guards have also been made from cast steel and from drop forged steel, and also in order to simplify the manufacture of steel guards, in some cases there is employed a multiplicity of smaller drop forgings which are welded together to form a complete guard. An objection to all such cast steel guards is that they are massive and heavy and also are much more expensive to make than the ordinary cast malleable guard due to the nature of the process of manufacture.

Another objection to the cast or forged steel guard is that breakage of the parts will often occur as due to its great strength and rigidity the steel guard has very little give in the event that a stone or other hard object is caught between the guard and a section of the reciprocating knife, as is the case of the ordinary malleable guard, which will yield sufficiently under an impact to prevent breakage of knife sections but which, as before stated will fracture or break when attempt is made to straighten it after yielding or bending to the imposed strain.

The object of this invention is to provide a guard of the character referred to together with the method of making the same which will impart to the guard the necessary degree of strength required and at the same time give to the guard such a degree of elasticity as will enable it to yield under impact and then spring back to its original shape after the stone or other obstruction which has lodged between the guard and cutter has been removed.

In the accompanying drawing:

Fig. 1 is a perspective view of a portion of a mower to which the improved finger guards for the reciprocating cutter have been applied.

Fig. 2 is an enlarged transverse section on the line 2—2 of Fig. 1.

Fig. 3 is a plan view of one of the guards.

Fig. 4 is a transverse section on the line 4—4 of Fig. 3.

Fig. 5 is a transverse section on the line 5—5 of Fig. 3.

Fig. 6 is a transverse section on the line 6—6 of Fig. 3.

Fig. 7 is a plan of the flat blank before the forming operation of a guard is performed.

Fig. 8 is a side elevation of a modified form of guard.

Fig. 9 is an enlarged partial horizontal view on the line 9—9 of Fig. 8.

Referring to the drawing, the main body portion of the guard is stamped, as a first step, from flat stock such a steel sheet or strip steel, the stock having been chosen and heat treated to give not only proper strength but also being of a nature which will allow it to spring or become deformed under the strain of an obstruction and spring back to its original shape after the obstruction has been removed. The blank from which the main portion of the guard is formed is illustrated in Fig. 7. It will be noticed in Fig. 7 that the blank is provided with a forward lip portion 1 having sides 2 which are inclined inwardly in a forward direction, the extreme forward end of the lip being slightly inclined rearwardly in opposite directions as indicated at 3. The rear portion 4 of the blank is formed considerably wider than the lip and has an opening 5 to receive a rivet 7 or other suitable fastening device by which the guard after it has been completed can be secured to the guard finger bar 8.

As a second step, the blank so formed is then pressed in either a hot or cold condition, depending upon the material used, or otherwise formed to the desired contour of the main portion of the guard. The lip portion 1 has then assumed a trough form which is V-shaped in cross-section, with the edges 2 in the same horizontal plane. The wider portion 4 by this pressing operation has been formed with a U-shaped depression 9 which forms on the other side of this widened portion a U-shaped strengthening rib 10 which embraces the opening 5. The intermediate neck of the blank indicated at 11, the sides of which have been formed on curves as indicated at 12,

has had the side edges thereof upturned so as to form in effect flanges which unite with the rear ends of the sides 1' of the lip portion 1 and also with the forward side edges of the widened portion 4; the curved side facilitating bending and the flanges acting to strengthen the structure.

As a third step in forming the guard, the upper edges 2 are hardened and ground so as to form cutting edges which cooperate with the reciprocating knives 13 secured to the usual knife bar 14. These cutting portions of the guard may be left unserrated or as shown in Figs. 8 and 9 the sides 1' of the lip just below the cutting edges 2 may be provided with a series of serrations 15. Where such serrations are used they are preferably made in the blank before the bending operation and give substantially the same type of cutting edge employed on other guards having ledger plates. If desired, instead of having the cutting edges formed on the side walls 1' of the lip, a separate ledger plate may be secured to the upper edges 2 in the manner described in my co-pending application for patent for improvement in knife guard, executed and filed as of even date herewith.

As a fourth and last step in the method of constructing the improved guard, there is attached to the outer end of the lip 1 a pointed steel tip or nose 16 having a rearwardly extending portion 17 which overhangs the edges 2 of the lip. This nose and its overhanging part 17 may be formed by drop forging, casting or stamping, and the nose is rigidly attached to the forward end of the lip preferably by welding. The under side of the nose and its extension 17 are undercut as shown so as to lie against the inclined edges 3 of the forward end of the lip and a portion of the upper edges 2 as shown best in Fig. 2.

Having thus described my invention, I claim:

1. The method of forming a guard for a reciprocating cutter consisting in stamping from sheet steel or the like which has been treated to impart to it a resilient character a blank having a forward

lip portion having sides which are inclined inwardly in a forward direction with the extreme forward end of the lip slightly inclined rearwardly in opposite directions from the center of the lip to the outer edges and the rear portion of the blank widened to form an attaching portion, pressing the blank so formed to cause the lip to assume a channel form with the upper edges of the sides of the channel in the same horizontal plane and the extreme forward inclined ends of the sides forming straight faces which extend from the bottom of the channel to the extreme outer edges of the sides, forming a pointed steel nose having a rearwardly extending integral portion with faces which mate with the faces on the outer end of the lip and also with portions of the upper edges of the lip, and then connecting the mating faces by a welded joint.

2. The method of forming a guard for a reciprocating cutter consisting in stamping from sheet steel or the like which has been treated to impart to it a resilient character a blank having a forward lip portion having sides which are inclined inwardly in a forward direction with the extreme forward end of the lip slightly inclined rearwardly in opposite directions from the center of the lip to the outer edges and the rear portion of the blank widened to form an attaching portion, pressing the blank so formed to cause the lip to assume a channel form with the upper edges of the sides of the channel in the same horizontal plane and the extreme forward inclined ends of the sides forming straight faces which extend from the bottom of the channel to the extreme outer edges of the sides, hardening and grinding the upper edges of the channel, forming a pointed steel nose having a rearwardly extending integral portion with faces which mate with the faces on the outer end of the lip and also with portions of the upper edges of the lip, and then connecting the mating faces by a welded joint.

WILHELM VUTZ.