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M. BOYER

2,332,840

SICKLE BAR

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Fig. 1

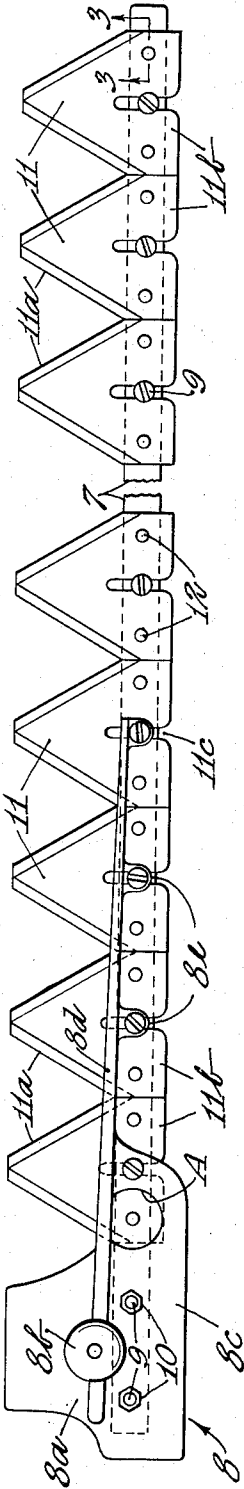


Fig. 2

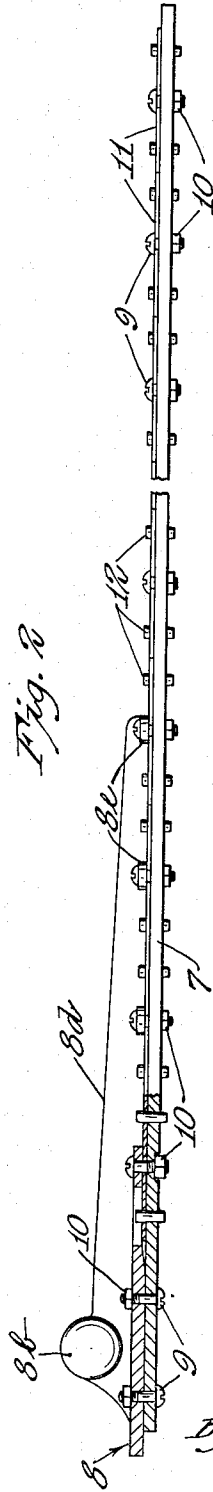


Fig. 3

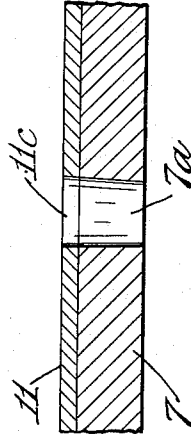
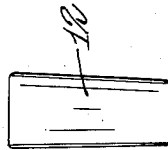


Fig. 4



UNITED STATES PATENT OFFICE

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SICKLE BAR

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3 Claims. (Cl. 56—300)

This invention relates to reciprocating sickle bar construction of the type used in mowing, reaping and cutting machinery.

It is an object of my invention to provide a sickle bar and multiple knife construction for reapers, mowers and the like, wherein the knives or blades are very efficiently mounted and secured for quick and easy detachment to permit selective removal and sharpening of damaged blades.

It is a further object to provide a scientifically balanced multiple blade assemblage comprising a minimum number of parts and adapted to be manufactured at very low cost wherein the multiplicity of blades are securely held by cooperating means against displacement, twisting and strain, but, nevertheless, may be very quickly and selectively removed and replaced without the use of tools.

More specifically it is an object to provide an improved reciprocating sickle bar construction wherein each blade is attached and securely held by the combination of pin and slot engagement with the central and rearward portion of the blade and with precise aligning attachment means in the form of downwardly tapered pins snugly fitting registering apertured portions at the sides of the blades and in the bar proper respectively, the apertures in the normal drilling operation thereof being slightly tapered to precisely conform to the shape of the securing pin.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawing, wherein like reference characters refer to the same parts throughout the views, and, in which:

Fig. 1 is a top plan view of a form of my improved cutter bar detached, a central portion of the bar being broken away to enable the scale of the drawing to be increased;

Fig. 2 is a view of the cutter bar mostly in rear side elevation with a portion of the coupling head and retaining bar shown in vertical section;

Fig. 3 is a cross section taken on a greatly enlarged scale through approximately the line 3—3 of Fig. 1 showing the registration of the securing apertures formed in one portion of one of the blades and in the retaining bar;

Fig. 4 is a greatly enlarged side elevation of one of the securing pins; and

Fig. 5 is a top plan view of one of the blades detached.

My improved sickle bar and knife construction employs preferably a simple elongated retaining bar 7 preferably constructed of steel and having,

as shown, parallel longitudinal edges. The bar may be constructed from stock material purchased on the open market. To the inner end of this retaining bar is secured an attachment plate 8 of more or less conventional form having the coupling head 8a provided with the usual enlarged ball 8b for ball and socket connection with conventional bar reciprocating mechanism employed on the mower or reaper. Attachment plate 8 includes a wide attachment flange 8c at its inner portion and an upstanding longitudinal rib 8d extending for some distance above the forward edge of retaining bar 7 and having formed integrally therewith a series of spaced horizontal and rearwardly extending bolt receiving lugs 8e which overhang and are spaced from the top surface of retaining bar 7.

Attachment plate 8 is rigidly secured to the retaining bar 7, in any suitable manner, preferably by arc welding the heavier attachment flange 8c at its under side to the upper surface of the corresponding end of the retaining bar 7. A series of upstanding attachment members which, as shown, are in the form of bolts 9, extend through both said attachment plate and said retaining bar and have threaded ends engaged by nuts 10. Bolts 9 are spaced apart from center to center distances equal to the width of the cutter blades 11 for a reason which will presently be apparent. It will be noted that the wide flange 8c of the attachment plate is cast or otherwise made somewhat thicker than the bolt receiving lugs 8e, whereby the rib 8d at its lower edge and the lugs 8e are spaced a short distance above the top of retaining bar 7 sufficient to accommodate the cutter blades 11. The forward portions of the cutter blades 11 are of conventional structure, each having the two converging beveled cutting edges 11a and having the short parallel side edges and the straight rear edges 11b. Each blade has a longitudinal slot 11c extending from its rear edge 11b inwardly to approximately the center of the blade for accommodation of and close fitting with the upstanding securing members or bolts 9. The corners defining the opening of the slot are preferably rounded to make a converging entrance.

Each cutting blade is provided with a pair of spaced scientifically disposed pin receiving apertures 11d punched, drilled or otherwise formed from the upper side of the blade and disposed along a line parallel with and a short distance forwardly of the rear edge 11b. The punching or drilling of said apertures from the top side of the blade inherently produces a slight downward tap-

ering of the socket or opening formed. The retaining bar 7 is punched, drilled or otherwise processed to produce spaced apertures 7a registering when the blades are positioned with the apertures 11d, and said apertures on the bar are punched or otherwise formed from the upper face through the bar and of very slightly smaller diameter than the apertures in the blades, the processing of the apertures inherently producing a very slight downward taper of the registering bar apertures 7a.

The relationship and registration of the apertures 7a in retaining bar and the apertures 11d in the cutter blades is illustrated in the enlarged detail section, Fig. 3, wherein the tapering, however, is slightly exaggerated. The blades 11 nicely fit in thickness the space between the attachment plate and retaining bar with the central slots 11c snugly accommodating the bolts or upstanding securing members 9 and with the apertures 11d perfectly aligned with the aperture 7a of the retaining bar. The blades are anchored in precise balanced cutting position by means of small tapering pins 12 which are tapped in place on the top surfaces of the blades. It will be noted that a relatively large aperture A is made through the wide base flange 8c of the attachment plate to facilitate application of the left-hand pin of the first cutter blade. These pins 12 taper very slightly from the upper to the lower ends to perfectly fit the slightly tapering recesses 11d and 7a.

It will be noted that upstanding securing members or bolts 9 are provided throughout the entire length of the retaining bar beyond the outer end of the rib 8d of the attachment plate and having their heads properly spaced above said bar for accommodation of the slotted portions of the cutter blades 11.

With my improved structure as described and illustrated the sickle bar is scientifically balanced with the blades detachably secured in precise cutting position and have the combination of the two tapered pins and each blade and the central upstanding member or bolt 9 which is received in the central rear longitudinal slot 11c of the blade. The blades may be instantly removed for replacement, sharpening or repair by merely tapping the pins upwardly from underneath the retaining bar, removing the pins and then sliding the blade or blades forwardly from the retaining bar. It will be noted that there is no play in the connection of the retaining pins 12 and the fit of the slotted portion 11c with the upstanding bolts 9 is snug so that shearing strains and impacts are distributed between the three cooperating securing members. The tapered pins 12 are very firmly nested. Because of the slight taper, and the application from the top sides of the blades, they will never be displaced or fall out during the operation of the device.

From the foregoing description it will be seen that I have provided a very simple but highly efficient sickle bar construction capable of being manufactured at low cost and having the several removable cutter blades properly balanced and efficiently secured for quick replacement or detachment.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. Sickle bar construction for mowing and reaping machines comprising an elongated retaining

bar having coupling means attached thereto, a series of quickly removable cutter blades disposed in side-by-side relation upon said bar and having their cutting edges extending forwardly of said bar, a series of upstanding attachment members secured to said bar and spaced apart a distance substantially equal to the width of one of said cutter blades, said cutter blades having rear attachment portions provided with an open slot extending from the rear edge thereof inwardly, the width of said slot being substantially equal to the thickness of said upstanding attachment members to snugly receive one of said members and substantially engage the same, said blade attachment portions having a pair of attachment passages disposed on opposite sides of said slot, said passages being slightly tapered from the top of said blades downwardly, said bar having a series of attachment passages therethrough with which the respective passages of said blades are aligned when said blades are slid rearwardly into place with said slots engaging the respective upstanding attachment members, the attachment passages through said bar tapering slightly from the top of said bar downwardly in continuation of the taper in the attachment passages of said blades and a pair of attachment pins for each blade tapered slightly downwardly from their upper ends, said pins being insertable from above said blades and bar and extending through said passages in a blade and the corresponding passages in the bar for removably securing said blade in place in cooperation with the associated slot-engaging, upstanding attachment member of said bar, said pins being of a length to cause their lower ends to project somewhat beyond the under surface of said bar when in secured position to facilitate upward removal of said pins by tapping from below.

2. Sickle bar construction for mowing and reaping machines comprising an elongated retaining bar having coupling means attached thereto, a series of quickly removable cutter blades disposed in side-by-side relation upon said bar and having their cutting edges extending forwardly of said bar, a series of headed upstanding attachment members secured to said bar and spaced apart a distance substantially equal to the width of one of said cutter blades, said cutter blades having rear attachment portions provided with an open slot extending from the rear edge thereof inwardly, the width of said slot being substantially equal to the thickness of said upstanding attachment members to accommodate and substantially engage the same, the heads of said attachment members being disposed above said bar a distance substantially equal to the thickness of the attachment portions of said blades, said blade attachment portions having at least one attachment passage slightly tapered from the top downwardly, said bar having a series of attachment passages therethrough with which the respective passages of said blades are aligned when said blades are slid rearwardly into place with said slots engaging the respective upstanding attachment members, the attachment passages through said bar tapering slightly from the top downwardly in continuation of the taper in the passages of said blades and an attachment pin for each blade tapered slightly downwardly in conformance with said passages and insertable from above said blades and bar for removably securing the blades in place.

3. In sickle bar construction for mowing and reaping machines, an elongated retaining bar, a

series of interfitting, upstanding attachment members connected with said retaining bar, a series of quickly removable edge-carrying members having side cutting edges extending forwardly of said bar, said edge-carrying members having rear attachment portions each provided with an open recess extending from the rear inwardly, the width of said recess being substantially equal to the thickness of said upstanding members to snugly receive one of said members, said attachment portions each also having a pin receiving passage extending therethrough and slightly tapered from the top downwardly, the portion of said retaining bar below said attachment portion having a pin receiving passage also tapered downwardly from the top thereof in continuation of the taper of said first mentioned

5 passage, said two attachment passages being in registration when said attachment member and said attachment element are interfitted, and an attachment pin for each edge-carrying member tapered slightly downwardly from its outer end and being insertable from above said attachment portion through said registering passages to removably secure said edge-carrying member in rigid operative position in cooperation with the associated upstanding attachment member connected with said bar, said pin being of a length to cause its lower end to project somewhat beyond the undersurface of said retaining bar when in secured position to facilitate upward removal thereof by tapping from below.

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