

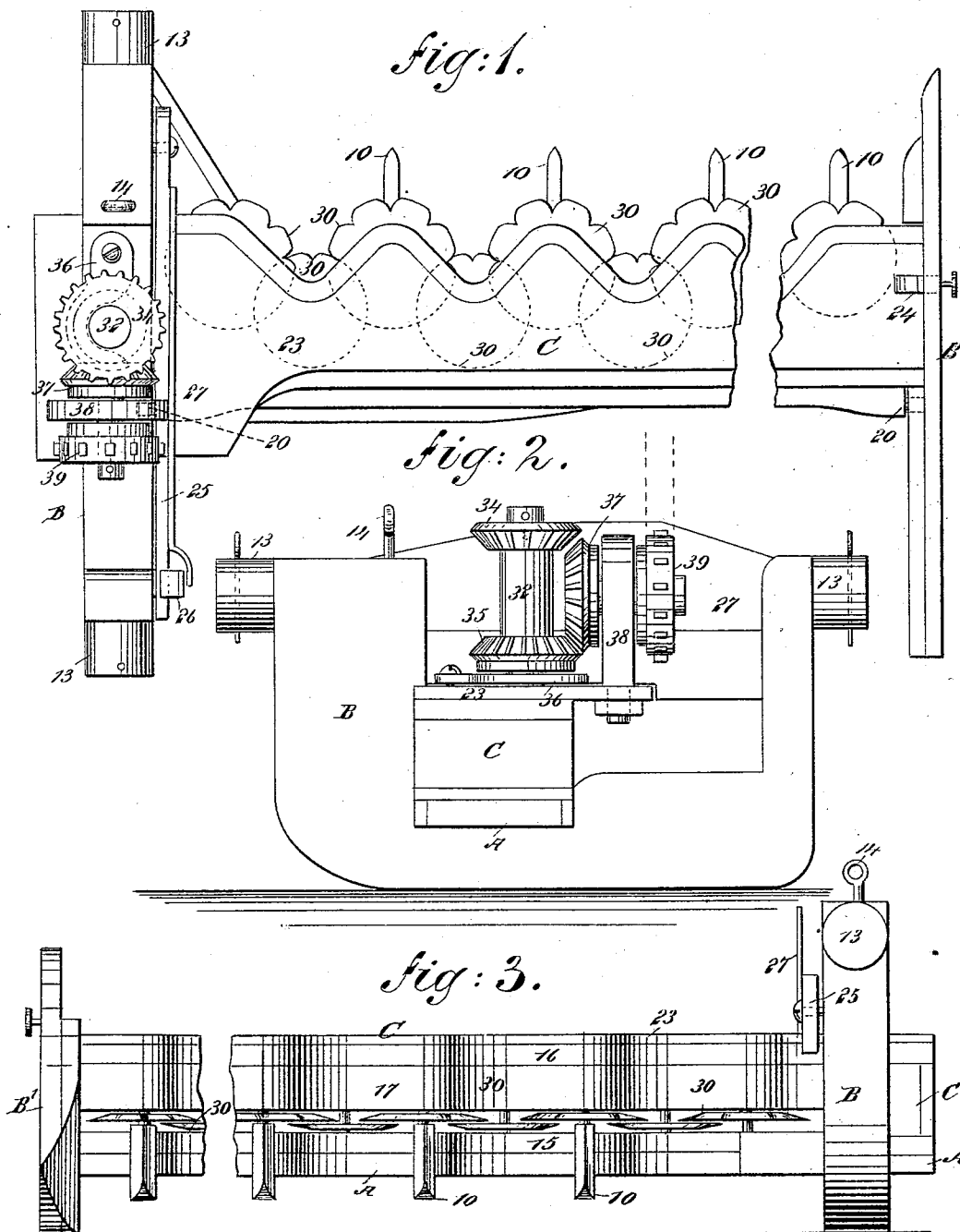
(No Model.)

2 Sheets—Sheet 1.

J. SMITH.
SICKLE BAR.

No. 551,236.

Patented Dec. 10, 1895.



WITNESSES:

Chas. Vign.
J. H. Acker

INVENTOR

J. Smith
Munn & Co.
ATTORNEYS.

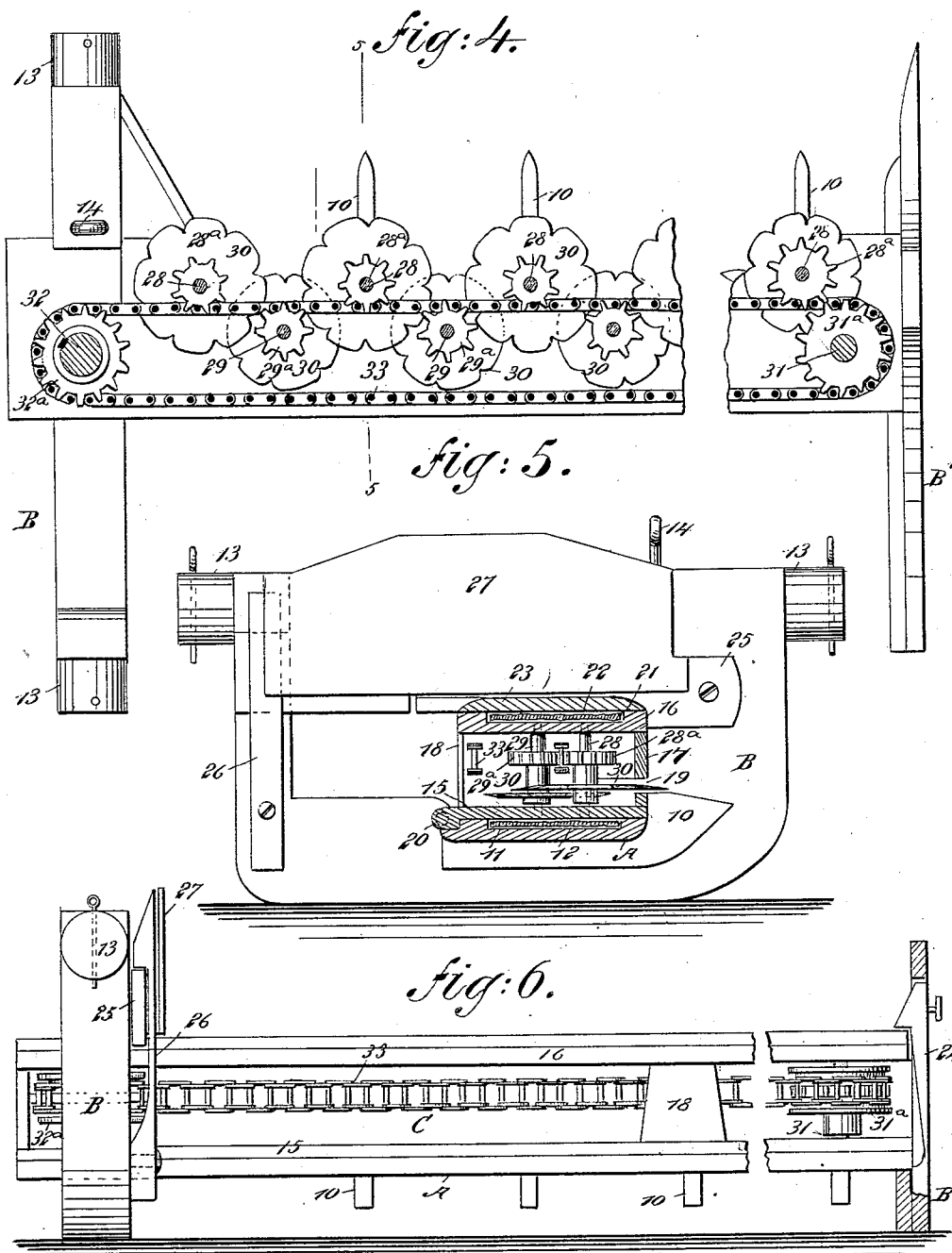
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UNITED STATES PATENT OFFICE.

JAMES SMITH, OF GRANITE CAÑON, WYOMING.

SICKLE-BAR.

SPECIFICATION forming part of Letters Patent No. 551,236, dated December 10, 1895.

Application filed January 26, 1895. Serial No. 536,308. (No model.)

To all whom it may concern:

Be it known that I, JAMES SMITH, of Granite Cañon, in the county of Laramie and State of Wyoming, have invented a new and useful Improvement in Sickle-Bars, of which the following is a full, clear, and exact description.

My invention relates to an improvement in sickle or cutter bars for mowers; and it has for its object to so construct the cutter or sickle bar as to materially lighten the draft in mowing grass and harvesting grain.

Another object of this invention is to so construct the bar that it may be used as well for trimming hedges as for cutting grass.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the improved sickle-bar. Fig. 2 is an end view thereof. Fig. 3 is a front elevation. Fig. 4 is a horizontal section taken through the cutter-bar. Fig. 5 is a transverse section taken substantially on the line 5 5 of Fig. 4, and Fig. 6 is a rear elevation of the sickle-bar.

In carrying out the invention the finger-bar A is provided with the usual guards 10, and the front of the said finger-bar is scalloped or rendered undulating, a guard being located at the apex of each scallop-section. The finger-bar is provided upon its upper surface with a depression forming a pocket 11, the said pocket or depression extending longitudinally and transversely a major portion of the bar, and in this pocket 11 a pad 12 is placed, made of an absorbent material, the said pad being adapted to be kept moist with a lubricating liquid.

One end of the finger-bar A is secured in a shoe B, the said shoe being adapted to be located next to the machine or truck to which the team is attached, and the opposite end of the finger-bar is secured to a parallel shoe B'. The inner shoe B is fitted with trunnions 13 at its ends whereby it is journaled in suit-

able bearings upon the truck of the mower, and the finger-bar is raised and lowered by connecting suitable levers on the truck with, for example, an eye 14 placed upon the inner shoe, as shown in the drawings.

The cutter-bar C is mounted upon the finger-bar A, and, as shown especially in Fig. 5, the cutter-bar consists of a lower plate-section 15, which rests upon the finger-bar, an upper plate-section 16 and a front section 17 connecting the upper and lower plate-sections, together with suitable standards or tie-plates 18, connecting the upper and lower plates at the back, the tie-plates being placed at suitable distances apart. The front plate 17 of the cutter-bar is made undulating or scalloped to correspond to the front contour of the finger-bar, as shown in Fig. 1. The front plate of the cutter-bar is provided with a longitudinal opening 19, which extends practically from one shoe to the other. The cutter-bar is pivoted or fulcrumed at the lower edge of its rear portion in the said shoes, as shown at 20 in Fig. 5, and in the top plate 16 of the cutter-bar a depression or pocket 21 is formed, extending longitudinally and transversely, adapted to receive a pad 22 of an absorbent material corresponding to the lower pad 12, and this pocket is covered by means of a cap-plate 23, which extends from end to end of the cutter-bar, and from front to rear.

The cutter-bar is held horizontally upon the finger-bar preferably through the medium of a spring-latch 24 located in the outer shoe B', as shown in Fig. 6, together with a latch 25, fulcrumed upon the outer portion of the inner face of the inner shoe B, and the said latch is made to extend over the inner end portion of the cutter-bar and is held normally in clamping engagement with said bar by means of a catch 26, and the catch 26 is preferably provided with a guard-plate 27, extending upwardly from the latch, being adapted to shield the driving mechanism of the cutters of the cutter-bar.

In the forward portion of the cutter-bar a line of vertical shafts or spindles 28 is journaled, and the said spindles or shafts 28 are located opposite the apexes or points in the front portion of the bar, as shown best in Fig. 4, and at the rear of the first line of spindles

or shafts 28 a second line of spindles or shafts 29 is journaled in the said cutter-bar, the rear line of shafts 29 being between the front line 28 as well as to the rear of them. It will be understood that the shafts or spindles extend through the top and bottom plate-sections of the cutter-bar, being kept constantly lubricated through the medium of the pads 12 and 22 saturated with a lubricating compound, as shown in Fig. 5.

Upon each shaft 28 and 29 a disk cutter is mounted, the said disk cutters being designated in the drawings as 30, and preferably all of the said cutters are provided with notches or recesses in their periphery, whereby said periphery is made up of series of wide teeth.

The disk cutters in the front row overlap those in the rear row; but while the front and rear cutters are made to revolve quite close together they do not touch one another, and thus are prevented from becoming heated. The cutters are likewise adapted to travel in opposite directions—that is, the front row of cutters will travel to the right and the rear row to the left. The front cutters are raised above the rear cutters, and the said front cutters are ground or sharpened upon their upper edges, while the lower or rear cutters are ground upon their lower edges. Thus it will be observed that the cutters act with relation to each other in like manner as a pair of shears; but the friction present in a shear action is not present in the operation of the aforesaid cutters, since they are not actually brought in contact.

The cutters are preferably secured upon their spindles by forming square shoulders on the spindles and producing square openings in the cutters. Each spindle 28 of the front row has a pinion 28^a secured thereon, and each spindle 29 of the rear row is provided with a like pinion 29^a.

At the outer end of the cutter-bar, preferably somewhat near the rear edge, a shaft 31 is vertically journaled, carrying a sprocket-gear 31^a, and the shaft 31 simply extends through from top to bottom of the cutter-bar, while at the opposite or inner end of the said cutter-bar a drive-shaft 32 is journaled and extends well upward above the top of the cap-plate 23, being provided within the cutter-bar with a sprocket-gear 32^a, firmly secured thereon.

The two gears 31^a and 32^a carry an endless chain belt 33, and this chain belt likewise meshes with the teeth of all of the pinions of the front and of the rear row of cutter-shafts. Since the gear 31^a and shaft 31 at the outer end of the shoe occupy considerable room at this point, the outermost and last cutter will necessarily be smaller than the others, and therefore the gear upon that cutter-shaft 28 will be larger, as shown in Fig. 4, in order to have all of the cutters move at the same speed, and, as illustrated in Fig. 6, the gear 31^a will

be cut away or grooved on its under face to permit the outermost forward cutter to be of the largest possible diameter.

The upper end of the shaft 32 is provided with two beveled gears 34 and 35 adjustable thereon. The gears face in opposite directions, one being located at the top and the other near the cap-plate 23, as shown in Fig. 2. Only one of these gears is brought into action at one and the same time. The lower gear 35 is held up to an engagement with a driving-gear 37, preferably by means of a latch 36, pivoted upon the cap-plate, the latch being made to loosely surround the shaft 32, and by an intervening washer hold the lower gear 35 up to working position. When the latch is disengaged, the gear 35 is readily moved out of working position. The upper gear 34 is held upon the shaft either in working position or out of working position by means of pins, set-screws, or their equivalents.

The gear 37 is mounted upon a suitable shaft placed at right angles to the vertical shaft 32 and journaled in a standard 38, erected upon the cap-plate, and the rear end of the shaft upon which the gear 37 is secured is provided with a sprocket-wheel 39, since a chain is employed for driving the cutters of the cutter-bar from the driving mechanism of the truck instead of the pitman ordinarily used, and the shaft on the truck employed to drive the chain, which is in driving connection with the sprocket-wheel 39, is on a true line with the bearings on the foot of the machine, by which the bar is raised and lowered, and being thus on a line the raising and lowering will not affect or change the length of the chain even when carried to a perpendicular position, so that hedge fences may be trimmed and the machine may be immediately lowered to cut the grass.

I desire it to be distinctly understood that if in practice it is found desirable only the front line of cutters may be notched and the rear line may be made of plain disks.

The lower lubricating box or pocket 11 may be readily filled by releasing the cutter-bar from its catches and throwing it back on its hinges, exposing the said box, and at the same time the cap 23 may be removed from the cutter-bar and the upper box 22 be likewise replenished.

It will be observed that by placing the shaft 31 and the gear 31^a in the cutter-bar, all of the cutter-gears will be acted upon alike by the driving-chain 33.

By reason of the shifting device shown in Fig. 2 the cutters will be revolved in one direction when the gear 37 is in mesh with the lower shifting-gear 35, and in the event the cutting-edges of one side of the teeth of the cutting-disks become dull, the edges at the opposite side of the teeth may be brought into action by simply dropping the lower gear 35 out of mesh with the driving-gear 37 and

bringing the upper gear into mesh with the said driving-gear.

It will be understood that the cutters may have plain peripheries, and also that a different form of reversing mechanism may be substituted for that shown in the drawings.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

10 1. In a sickle bar, a series of overlapping disk cutters, means for rotating adjacent cutters in opposite directions and means for reversing the direction of rotation of the cutters, whereby each of the alternate cutters is
15 adapted to co-operate with either of the cutters between which it is located, substantially as shown and described.

2. In a sickle bar, disk cutters arranged in staggered order, adjoining cutters being made
20 to overlap, the rear cutters being each arranged between pairs of front cutters, means for rotating the front and rear cutters in opposite directions, and means for reversing the rotation of the cutters, whereby the rear disks
25 may each be caused to co-operate with either of the front disks between which it is located, substantially as shown and described.

3. In a sickle bar, a series of disk cutters mounted to revolve over the guards of the bar, a rear series of cutters arranged between
30 the forward cutters, the front and rear cutters overlapping, and each rear cutter being arranged to co-operate with either of the front cutters between which it is located, one set of
35 cutters having their upper edges sharpened and the other set their lower edges, gears connected with the various cutters, and an endless driving belt operating the said gears, the gearing being so arranged that adjoining
40 cutters will be revolved in opposite directions, as and for the purpose specified.

4. In a sickle bar, the combination with a finger bar, and the shoes to which said finger bar is secured of a cutter bar fulcrumed at
45 its rear portion in the said shoes and adapted to rest upon the finger bar, and latches secured to the said shoes and adapted to engage with the cutter bar to hold it in position, substantially as described.

50 5. In a sickle bar, the combination with a finger bar, and the shoes to which said finger bar is secured, of a cutter bar fulcrumed in the said shoes at the rear of the finger bar and resting on said finger bar, the said cutter bar being provided with a series of rotary
55 cutters and a driving mechanism therefor,

and means for holding the said pivoted cutter bar in position on the finger bar, substantially as set forth.

6. The combination, with a sickle bar and
60 a guard and support therefor, of a series of disk cutters mounted to revolve over the guards of the said support, a second series of disk cutters located at the rear and between the forward series, the forward disk cutters
65 being above the rear cutters and out of contact therewith, the several cutters being provided with toothed peripheries, the teeth having cutting edges on both sides, gears connected with the various cutters, an endless
70 driving belt connected with all of the gears, the gearing being so arranged that adjoining cutters will be revolved in opposite directions, a driving mechanism connected with the driving belt, and mechanism, whereby the direction
75 of rotation of the disks may be reversed, as and for the purpose set forth.

7. In a sickle bar, the combination, with a finger bar having a pocket in its upper face adapted to receive a lubricating material, of
80 a cutter bar pivoted at the rear of the finger bar and resting thereon, the said cutter bar being provided with series of rotary cutters and a driving mechanism therefor, the spindles of the said cutters and driving mechanism
85 extending from top to bottom of the cutter bar, the said cutter bar being provided upon its upper face with a receptacle for oil, and a cap covering the same, whereby the shafts in the cutter bar will be lubricated at
90 top and bottom from the said receptacles or pockets, substantially as set forth.

8. The combination, with a finger bar having a pocket formed upon its upper face, and an absorbent material located in the pocket,
95 of a cutter bar located over the finger bar and removable therefrom, the said cutter bar being provided with a series of rotary cutters and with a socket upon its upper face containing an absorbent material, the spindles
100 of the cutters extending through to the absorbent material at the top of the cutter bar and at the top of the finger bar, an endless chain operating the disk cutters, a driving shaft operating the said chain, and means,
105 substantially as shown and described, for rotating the driving shaft with a chain, as and for the purpose specified.

JAMES SMITH.

Witnesses:

J. D. HURD,
ED. J. HURD.