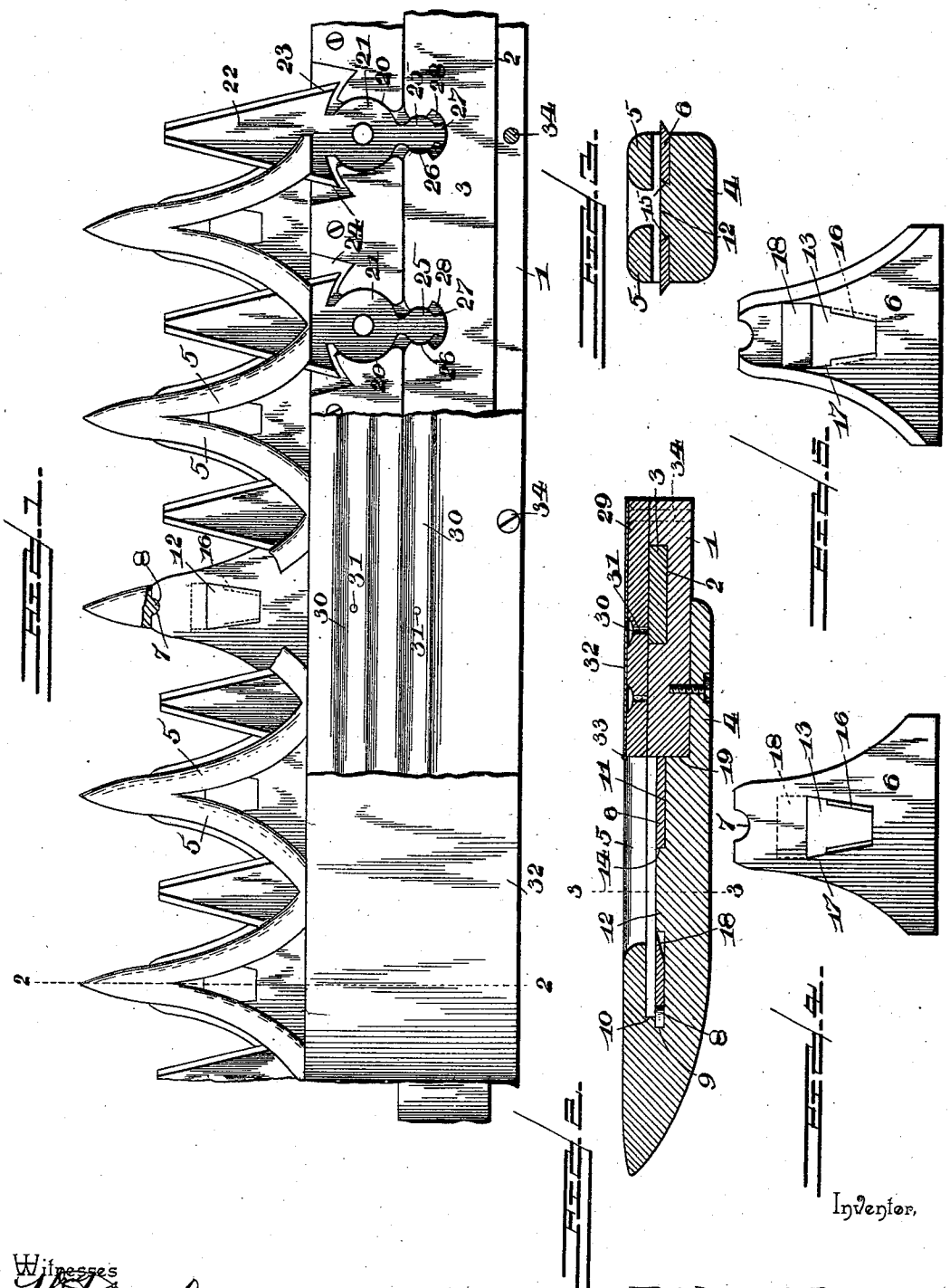
(No Model.)

R. EVANS.

CUTTER BAR FOR HARVESTING MACHINERY.

No. 563,463. Patented July 7, 1896.



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UNITED STATES PATENT OFFICE.

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CUTTER-BAR FOR HARVESTING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 563,463, dated July 7, 1896.

Application filed September 6, 1894. Serial No. 522,305. (No model.)

To all whom it may concern:

Be it known that I, RICHARD EVANS, a citizen of the United States, residing at Mitchell, in the county of Davison and State of South Dakota, have invented a new and complete Cutter-Bar for Harvesting Machinery, as set forth in the following specification.

My invention relates to cutting mechanism for harvesters, reapers, and similar machines, and it has for its object to provide a simple, inexpensive, and efficient construction and arrangement of parts whereby an oscillatory movement is imparted to the knives; to reduce the throw or length of movement of the knife-operating bar; furthermore, to provide means for increasing the extent of the cutting edges of the knives and ledger-plates, to prevent choking and enable said edges to be ground without reducing the length of the edges or detracting from the efficiency of the parts; furthermore, to provide improved means for securing the ledger-plates to the guard-fingers whereby they may be readily detached for grinding; to provide simple means for mounting the knives to enable them to be separately detached; to provide improved means for lubricating the moving parts of the cutting mechanism, and, furthermore, to provide means for protecting the lubricating devices to exclude dust and other obstructions.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view, partly broken away, of a cutter-bar constructed in accordance with my invention. Fig. 2 is a transverse section on the line 2 2 of Fig. 1. Fig. 3 is a detail transverse section of one of the guard-fingers on the line 3 3 of Fig. 2 to show the means for attaching the ledger-plate thereto. Fig. 4 is a detail plan view of a ledger-plate detached. Fig. 5 is a similar view of a ledger-plate inverted.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a finger-bar provided with a guide or seat 2 to receive the reciprocatory operating-bar 3, the upper surface of said operating-bar being flush with the upper surface of the finger-bar. Secured to the finger-bar are the guard-fingers 4, provided with open forked upper sides consisting of rearwardly-divergent arms 5.

The guard-fingers support the ledger-plates 6, which are provided at their front ends with notches 7, to engage spurs or projections 8 near the front ends of the guard-fingers, said projections 8 being arranged in horizontal transverse grooves 9, formed in the shoulders 10 near the front ends of the guard-fingers. The lower or body portions of the guard-fingers have flat horizontal upper faces 11 to form seats for the ledger-plates, and at intermediate points of these flat surfaces or seats are arranged rearwardly-tapered securing-blocks 12 to engage rearwardly-tapered openings 13 in the ledger-plates. Said securing-blocks are provided with abrupt rear ends 14 and undercut side edges 15, whereby said blocks are transversely dovetailed to correspond with the transversely-dovetailed openings 13 in the ledger-plates, said openings having beveled walls or side edges 16. (Clearly shown in Figs. 3, 4, and 5.)

The beveled walls 16 of the openings 13 terminate short of the front enlarged ends of the openings to form cut-away portions 17, and the under surfaces of the ledger-plates in advance of the opening 13 are beveled or cut away, as shown at 18, to facilitate the engagement and removal of the ledger-plates.

The ledger-plates are engaged with the securing-blocks 12 by inserting them in an inclined position into the space between the arms 5 and the seat 11, and forcing them forwardly and downwardly until the blocks 12 pass up through the transversely-dovetailed openings 13. In this position upward movement of the rear ends of the ledger-plates is prevented by the interlocking beveled edges of the securing-block and the engaging-opening, and in order to remove the ledger-plate it is necessary to move the same rearwardly and at the same time elevate its rear edge. The finger-bar 1 abuts against the shoulders 19 of the guard-fingers, and as the rear ends

of the ledger-plates are flush with said shoulders 19 it will be seen that rearward movement of the ledger-plates is prevented, when the parts of the machine are in place, by the front edge of the finger-bar, as clearly shown in Fig. 2.

The finger-bar is provided opposite the intervals between the front extremities of the guard-fingers with horizontally rounded or circular bearings 20 for the rounded bearing-disks 21 of the knives 22, the cutting edges 23 of said knives extending rearwardly beyond the front edge of the finger-bar in all positions of the knives to prevent crowding of grass or grain into the cut-away portions or seats 24 in which the knives operate. The knives extend rearwardly beyond the disks 21 to form rounded operating arms or lugs 25, and the operating-bar 3 is provided at intervals corresponding with the intervals between the knives with bearings 26, rounded at opposite sides to receive and fit the curved surfaces of said arms or lugs 25. Said arms or lugs are further extended to form ears 27, operating in segmental extensions 28 of the bearings 26, the contact of the sides of the ears 27 with the ends of the segmental openings 28 serving to limit the oscillatory movement of the knives.

The finger-bar is provided with a cap-plate 29, which is secured by bolts or other equivalents to the body portion of the bar to retain the knives and the operating-bar 3 in their proper operative positions, and in the upper surface of said cap-plate are formed oil-grooves 30, extending longitudinally and communicating with ports 31, which convey the oil to the concealed operating parts. In order to cover said oil-grooves and provide a smooth surface for contact with the grain or grass, I employ a sheet-metal shield 32, hinged, as at 33, to the front edge of the cap-plate 29 and adapted to lie in a horizontal position upon the upper surface of the cap-plate. When it is desired to lubricate the mechanism, said shield may be elevated at its rear edge to expose the oil grooves and ports, said shield also serving to cover the upper ends of the bolts 34, which are employed to secure the cap-plate to the body portion of the finger-bar.

From the above description it will be seen that the parts of the cutting mechanism are compactly arranged and at the same time are readily detachable to provide for replacement, repair, grinding, &c., and at the same time the operating parts are protected from dust and from accumulations of grass or particles of grain liable to obstruct the operation.

It will be seen, furthermore, that the ledger-plates are secured in their operative positions without the use of bolts, screws, or similar devices, and hence no obstruction is offered to the operation of the knives in traversing the ledger-plates. The securing-blocks are shown in the drawings as terminating flush with the upper surfaces of the ledger-plates, this arrangement being preferred for the reason that it facilitates the application of the ledger-plates and enables the operator to guide the plate during application by sight.

It will be seen, furthermore, that the cutting edges of the knives project in rear of the front edge of the finger-bar, and hence in rear of the extremities of the cutting edges of the ledger-plates, to avoid the crowding of dust or other obstructions into the seats of the knives, and in addition to this advantage it will be seen that the shearing cut of the knives is preserved throughout the movement of the knives in either direction. In order to accomplish this continuous shearing action, the cutting edges of the ledger-plates are concaved or deflected toward their rear ends, while the cutting edges of the knives are made straight. The grinding of the knives as they become worn does not materially reduce the length of the cutting edge, and hence the advantages above noted are not lost after grinding becomes necessary.

A further advantage of the above construction resides in the fact that the necessary oscillatory movement of the knives is attainable with less throw or reciprocatory movement of the operating-bar than with the ordinary construction of cutter-bar wherein the knives are carried by the operating-bar. The reason for this is that the arms or lugs by which motion is communicated from the operating-bar to the knives are at a less distance from the axis of movement of the knives than are the cutting edges, and hence the movement of the operating-bar is multiplied at the cutting edges.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. The combination with a guard-finger, of a rearwardly-tapered securing-block carried by the guard-finger and having undercut or beveled lateral edges, and a ledger-plate provided with a rearwardly-tapered opening closed at both ends and having beveled side edges to engage the side edges of the securing-block, the front portions of the beveled edges of said opening being cut away and the contiguous under surface of the plate, at 18, being beveled to facilitate engagement and disengagement of the ledger-plate, substantially as specified.

2. The combination of a guard-finger having a fixed securing-block tapered toward its rear end and provided with undercut or beveled side edges, and a ledger-plate provided with a rearwardly-tapered opening 13 having beveled side edges 16, the beveled portions of the edges of the opening being cut away at 17, and the under surface of the ledger-plate being beveled at 18, the rear edge of the plate being arranged in contact with the

front of the finger-bar, substantially as specified.

3. The combination of a guard-finger provided at its front end with a shoulder having a transverse groove 9 and an intermediate projection 8, a fixed securing-block arranged upon the upper side of the body portion of the finger and provided with undercut lateral edges, said block being tapered toward its rear end, and a ledger-plate provided at its front end with a notch 7 to receive said projection, adapted to fit in said transverse groove, and provided at an intermediate point with a rearwardly-tapered transversely-dovetailed opening to engage said securing-block, the front portion of the opening in the securing-block being cut away and the under surface of the plate being beveled to facilitate engagement thereof with the block, substantially as specified.

4. The combination with a finger-bar having ledger-plates, of knives having rounded disks 21 seated snugly in corresponding bearings in the finger-bar to form outside bearings, arms or lugs projecting rearwardly from said disks and rounded horizontally to form heads 25, and an operating-bar provided with rounded bearings 26 for the reception of said rounded heads, whereby motion may be communicated from the operating-bar to the knives to cause oscillation of the latter, substantially as specified.

5. The combination with a finger-bar having ledger-plates, of knives having rounded disks seated snugly in corresponding bearings in the finger-bar to form outside bearings, arms or lugs projecting rearwardly from said disks and rounded horizontally to form heads 25, an operating-bar provided with rounded bearings 26 for the reception of said rounded heads, whereby motion may be communicated from the operating-bar to the knives to cause oscillation of the latter, and extensions or ears 27 upon the arms or lugs of the knives operating in segmental openings 28 in the operating-bar to limit the movement of the knives and bar, substantially as specified.

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