L. Miller,
Mower

No. 2891
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Patented Dec. 10. 1861

Fig. 1.

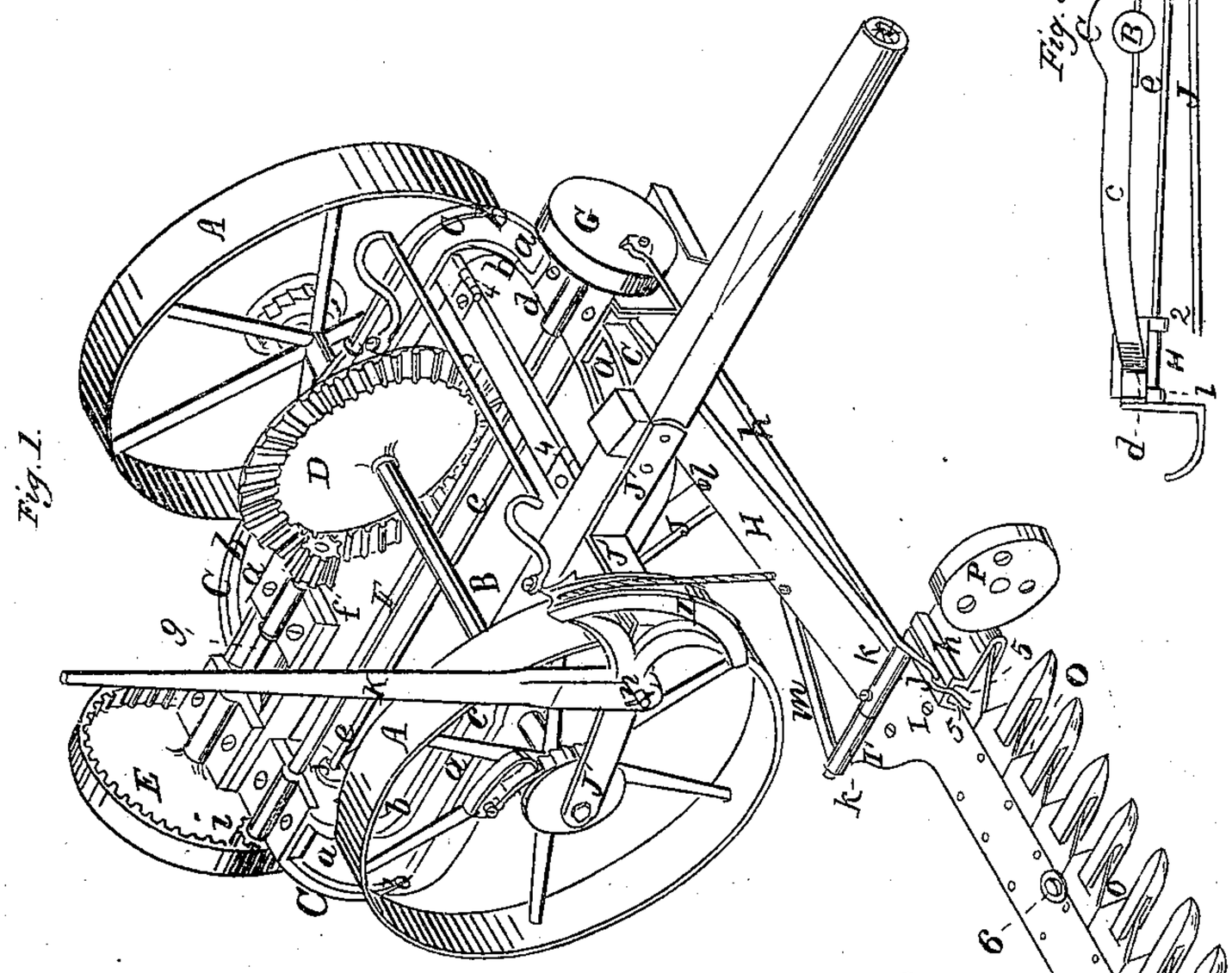


Fig. 2.

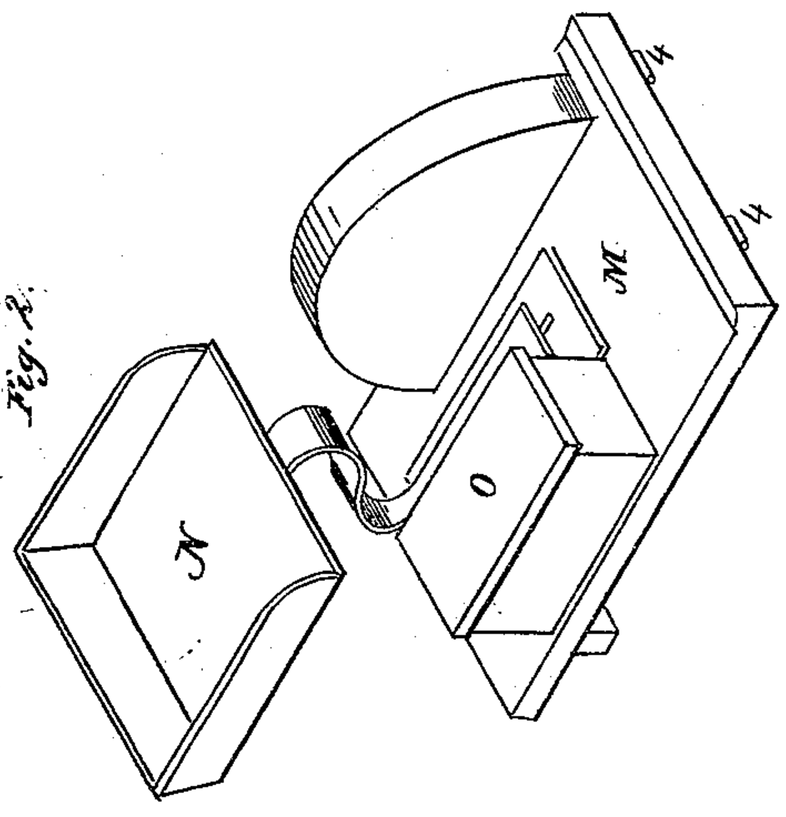


Fig. 3

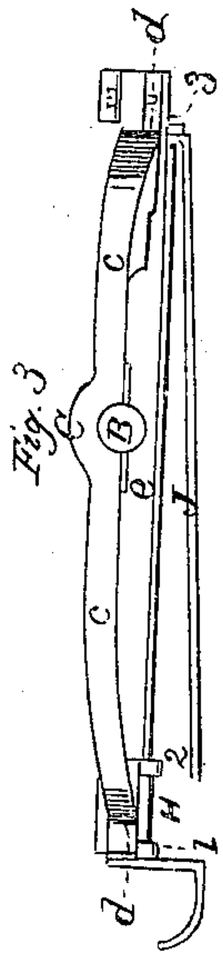
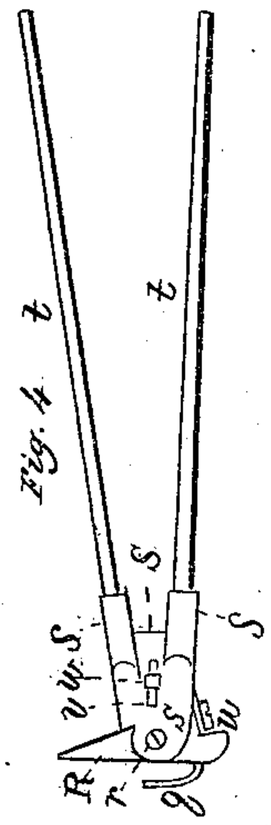


Fig. 4



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UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF CANTON, OHIO.

IMPROVEMENT IN GRAIN AND GRASS HARVESTERS.

Specification forming part of Letters Patent No. **33,895**, dated December 10, 1861.

To all whom it may concern:

Be it known that I, LEWIS MILLER, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Grain and Grass Harvesters; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the machine with the cover and its several accompaniments removed to show the gearing underneath it. Fig. 2 represents a perspective view of the cover with the driver's seat and tool-box connected to it. Fig. 3 represents a side view of the cast-iron main frame, showing its drooping ends. Fig. 4 represents the track-clearer and its connection with the heel of the outside divider or shoe, so that it may be adjusted thereon and be swung up out of the way when the cutter-bar is folded up to or on the main frame.

The object and purpose of one part of this invention is to use a cast-iron main frame and to make it of such form and construction as to be light, yet strong, and particularly to so unite the several parts which it carries and supports to it as that it will not spring when the ordinary strain comes upon it; and to this end I make said frame of an oval form and with drooping ends, and with a bolt passing through the frame from end to end, which bolt may form the hinge-joint for the brace and coupling-arm that support the finger and cutter-bar and their several parts.

The object and purpose of another part of this invention is to avoid the necessity of an intermediate shoe between the coupling-bar and the finger-bar; and to this end I widen out the main frame end of the finger-bar and use a brace extending from the coupling-bar to this extended portion of the finger-bar.

The object and purpose of another part of this invention is to make both the finger-bar and the cutter-bar in or of two sections, so that they may be shortened in changing the machine from a reaper to a mower. To this end I make a lap-joint in the finger-bar, the cutter-bar, and in the blade or cutter, so that when the short section is removed there will be a uniform flush termination of finger-bar, cutter-bar, and cutter or blade, to which the outside divider or shoe can be readily attached and with which the end of the cutter-bar and cutter will properly work, and thus, without any other means than those afforded by the finger and cutter bar and the cutters, being able to shorten or lengthen them at will, as the machine is changed from a reaper to a mower, or vice versa.

The object and purpose of another part of this invention is to make the track-clearer adjustable in a vertical point of view, while at the same time it is so hinged to the outer end of the finger-bar as that it may be turned up out of the way when the finger-bar is folded up to or on the main frame or when it is upon the ground. To this end I hinge the track-clearer to a block or support, on which there is a projecting stop or stops, and cut a slot in the web of the track-clearer, in which a nutted bolt may be moved to accomplish the purpose.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A A are a pair of carrying and independent driving wheels loosely placed upon an axle, B, but made to turn therewith by a pawl and ratchet when thrown in gear and when the machine is moving forward, but turning independent of the axle when the machine is backed. Upon this axle is placed the main frame C, made of cast-iron, of an oval form, and with drooping ends. For the sake of lightness this frame may have sunken panels *a*, or even open ones, and deep flanges *b*. For the sake of strength with lightness it is made of an oval form or with rounded corners, as being shorter than a square frame of a like length. The two sides *c c* of the main frame form two upright arches, and are held together by the axle B. The two ends *d d* of the main frame form two inverted arches, and are tied together by the tie-rod *e*, so that the frame thus made and tied together cannot spring, as the arches resist the tendency of either of them to flatten or camber, and the tie-rods prevent the frame from elongating in either direction, which would allow the arches to flatten. The frame is thus an arched and trussed frame, very light and very strong. The axle B, being rotated by the wheels when they are moving forward, gives motion to the bevel-gear D

upon itself, and this gear, through the bevel-pinion *f*, on one end of the shaft *g*, and a bevel spur-wheel, E, on the other end of said shaft, gives motion to the crank-shaft F through its bevel spur-pinion *i*. The crank-shaft F has its bearings in the center of the drooping ends of the main frame, and to its crank-wheel G is connected by a suitable wrist-pin one end of the pitman *h*, the other end being connected to the cutter-bar at *j*, so as to vibrate it.

On the under side of the main frame, at or near the points of greatest descent or drooping of the ends thereof, are cast lugs 1 2 3, more or less, through which the tie-rod *e* passes, and upon it, between the lugs 1 2, is placed one end of the coupling-bar H, the other end of said coupling-bar being hinged at *k* to the end of the finger-bar I; and at the rear lug, 3, by a pin or otherwise, is held one end of the brace-bar J, which extends forward, and has its forward end fastened to the coupling-bar H at the point *l*. This rod *e*, in this way, though designed as a tie-rod to the main frame, may be used as the hinge or pivot for the coupling-bar and the brace-bar; but I do not limit myself to this rod for all these purposes, as other pivot or hinge connections may be made on the lugs or frame for the coupling-bar and brace-bar, leaving the rod *e* as a tie-rod simply; but by connecting the coupling-bar and the brace-bar at or near the line of the tie-rod *e*, the strain which comes upon them in advancing the finger and cutter bars and their appendages over or along the ground does not tend to spring the main frame, as this springing is resisted by the trussed and arched form of said main frame, as above described, the strain coming upon said rod or the lugs, which are but a line in the direction of the forward motion of the machine. The finger-bar I is widened out at I′, so as to lengthen and give more leverage to the joint or hinge *k* between the coupling-bar H and said finger-bar, and to provide for a brace, *m*, extending from the rearmost end of the hinge to the coupling-bar. This long hinge and brace *m* make a strong connection between the coupling and finger bars without the use of an intermediate shoe between them. A brace, J′, of an ⅂-shaped form, extends from the point of the axle B on the grain side of the machine to the main frame, and to this brace is pivoted at *n* the lever K and its grooved arc L, from which latter extends a rope or chain that is secured to the coupling-bar, and by which the coupling-bar and finger-bar may be raised and held up or let down by the driver in his seat. The gearing is covered by a platform, M, Fig. 2, which for convenience is hinged to the main frame by the hinges 4, and upon this platform is placed the driver's seat N, which is adjustable thereon, and also the tool-box O.

At the main-frame end of the finger-bar there is a shield, *p*, which protects the end of the cutters, and this shield has upon its forward part a bearing-wheel, P, cast hollow for the sake of lightness, and having a slightly-rounded tread and flush sides, so that nothing may cling to it, and so that in turning round it may not run into or lift up the earth. On that part of the cutting apparatus which vibrates through the shield *p* are placed friction-rolls 5, for the purpose of relieving any undue friction between said cutting apparatus and shield; and upon the finger-bar, at suitable distances, are placed friction-rolls 6, against which the back of the cutting apparatus may run to avoid undue friction between said finger-bar and cutting apparatus.

The finger-bar I, the cutter-bar 7, and the blades *o* are so made as that a section of each may be removed without leaving any one of them projecting beyond the other more than will admit of a shoe or outside divider being attached thereto and made to operate therewith. The finger-bar and cutter-bar may be spliced by a half-lap, dowel, and screw-bolts; but the blades being very thin, and the fact that their exposed edges must be brought down to a sharp cutting-edge, make an ordinary half-lap a difficult matter. This splicing of the blade where the joint comes is made as follows: On the removable section of the cutter-bar there is a small thin blade, 8, and the last blade *o*′ on the immovable section is countersunk on its under side to receive the blade 8, and a sunken screw, 9, through both makes a lap-coupling without impairing the inclined cutting-edge of the blade at this point and without leaving any vertical joint in which grass or other material may work or clog. The fragmentary view of this joint in the finger-bar, cutter-bar, and blade, which is represented as having the joint slightly drawn asunder, represents this mode of uniting the sections of blades without impairing the cutting-edge or leaving a vertical joint in said edge. The object of making this line of lap-joint through the finger-bar, cutter-bar, and blade is that in changing the machine from a grain to a grass harvester, the finger-bar, cutter-bar, and cutters may be shortened, and vice versa, without having an extra cutting apparatus, and without removing any one part that must be replaced by another shorter or longer part, or, in other words, being able to convert the longer cut of a grain-harvester into the shorter one of a grass-harvester in the field without changing entirely the cutting apparatus or removing any one part that must be replaced by another part, being aware that the width of swath has been diminished by shifting the finger-bar and cutting apparatus farther under the main frame; but this, at least, requires a different pitman and makes a cumbersome matter of it at best. My invention involves the actual shortening and lengthening of the finger-bar and cutting apparatus, and not merely a change of width in the swath, leaving the finger-bar and cutting apparatus of the same length.

The outside shoe or divider, Q, has a spring, sole, *q*, upon it, which is made adjustable upon the heel of a block or piece, R, fastened to the

extreme end of the finger-bar I. To this block or piece R is pivoted at *r* a plate, S, which has upon it sockets, ferrules, or rings *s*, for holding the fingers *t t*, that form the track-clearer, said fingers being composed of wood or tapering spring-wires. A shoulder, *n*, Fig. 4, is formed upon or attached to this piece R, and in the plate S there is a slot, *v*, in which a set-screw, *w*, is placed. The head of the set-screw catching upon this projecting shoulder *u* defines the extent to which the track-clearer can descend, and this shoulder inclining, the removing of the set-screw *w* forward or back in its slots lowers or raises the track-clearer, but does not prevent its being turned up out of the way at any time, and the same set-screw may be used for holding it up out of the way—as, for instance, when turning around or moving from place to place—without folding up the finger-bar onto the main frame. When the finger-bar is folded up onto the main frame, the track-clearer will project rearward or downward, in either of which positions it is liable to be damaged by striking or catching into fences, gate-posts, or other intervening things in its passage. To avoid all such casualties, the set-screw can be run out to the end of the slot *v*, and the track-clearer swung up until the fingers point upward, and then by setting the screw *w* down against the sole of the shoe Q the track-clearer will stand in its vertical position and out of the way of accident.

Instead of the set-screw *w*, a spring-bolt may be used for holding and adjusting the track-clearer. The spring-bolt can be more easily detached than the set-screw, and by the inclined shoulder *u*, or a series of shoulders, the adjustment would be just as perfect as it would be with the set-screw, the spring-bolt being made capable of moving from or toward the divider by a slot, as in the case of the set-screw, or in the same slot now occupied by the screw-nut.

Having thus fully described the nature and object of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. In combination with the main frame having drooping ends, a tie-rod that may serve as a hinge for the coupling-arm and brace, substantially as herein described, and for the purpose set forth.

2. In combination with the widening out of the rear portion of the main frame end of the finger-bar, a brace, *m*, for the purpose of making a long hinge and strong connection between the finger-bar and coupling-arm, without the use of an intermediate shoe, substantially as described.

3. In combination with a finger-bar that is made in two sections longitudinally, a cutter and cutter-bar, also made in sections, so that the finger-bar and cutters may be shortened or lengthened for cutting grass or grain, as herein described and represented.

4. In combination with a pivoted or hinged track-clearer, the slot, set-screw, and shoulder, or their equivalents, for the purpose of controlling the descent of the track-clearer while it is in operation, and for allowing it to be swung up and held up out of the way when the machine is being transported from place to place, substantially as herein described.

LEWIS MILLER.

Witnesses:

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DAUL TONNER.