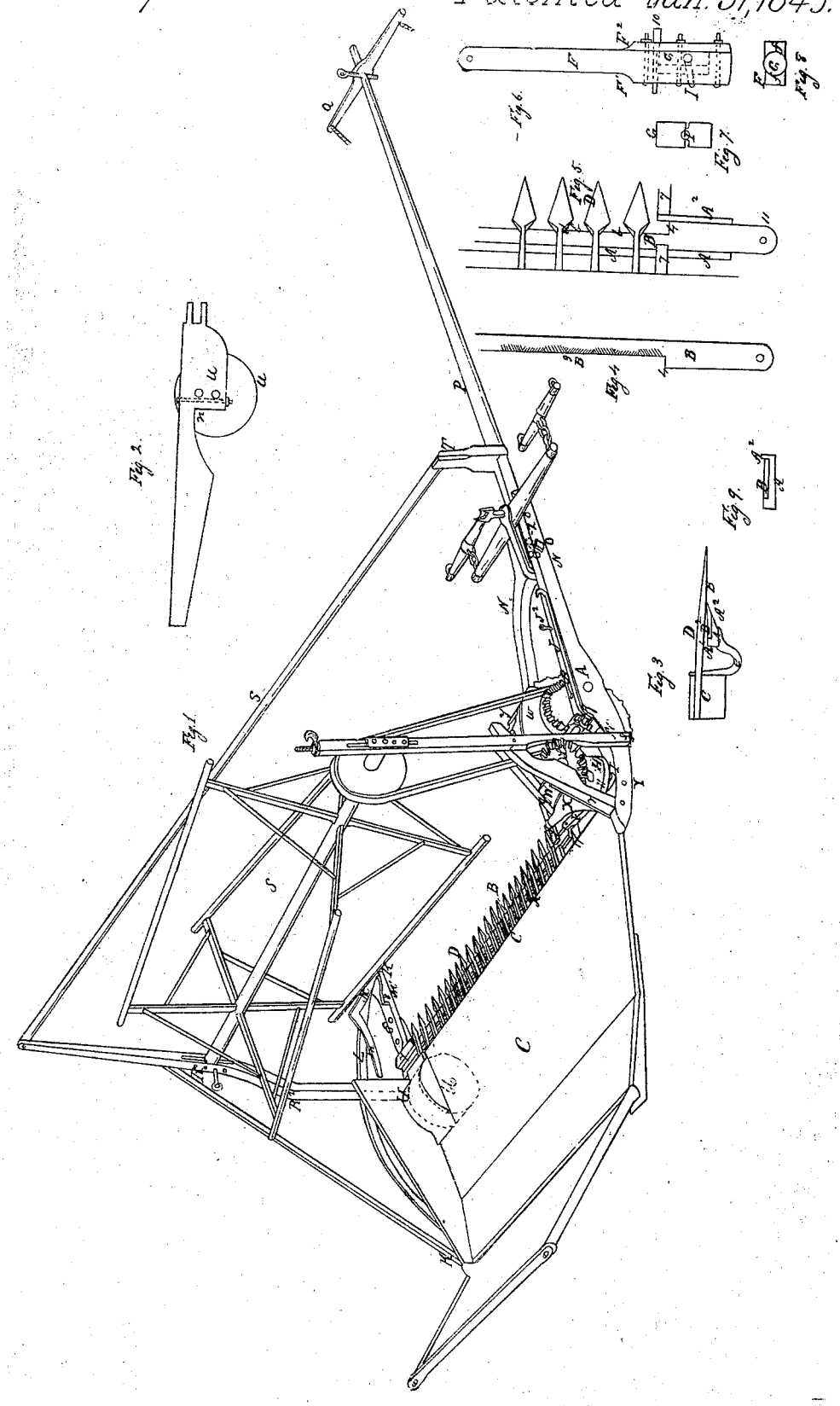
C. H. McCormick.

Mower.

No. 3,895. Patented Jan. 31, 1845.



UNITED STATES PATENT OFFICE.

CYRUS H. McCORMICK, OF ROCKBRIDGE COUNTY, VIRGINIA.

IMPROVEMENT IN REAPING-MACHINES.

Specification forming part of Letters Patent No. 3,895, dated January 31, 1845.

To all whom it may concern:

Be it known that I, CYRUS H. McCORMICK, of the county of Rockbridge and State of Virginia, have invented certain new and useful Improvements upon my patented Reaping-Machine; and I do hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

The first improvements which I would describe are in the cutting apparatus, as follows, viz: The blade-case A A A A A^2, in which the blade B B B B^2 plays and is secured, is a straight plate of iron, the length of the blade—say, one and one-fourth inch wide, three-eighths inch thick on the back, and less than one-eighth inch on the front edge, as at A, Figure 3. To the upper side of this plate is riveted a back, A′, Figs. 3 and 5, say, three-sixteenths inch thick (thickness of the blade) and five-eighths inch wide, having a width of five-eighths inch in front of the back, as at A^2, Fig. 3, for the blade to act upon. The end of this plate next to the crank is widened toward the front, as at A^2, Figs. 5 and 9, and turned up so as to receive and fit the end of the blade, (giving it room to act,) which is also extended in width, as hereinafter described. The other end of the plate is also widened in like manner. At the ends the width of the blade B is extended in front, as at 4 4, Figs. 4, 5, to one and three-fourths inch, being twice its width at the cutting part, so that the edge of the blade, though projecting over the case—say, one-fourth inch, as at B′, Fig. 3—is firmly and sufficiently supported by the ends and prevented from a tendency to wear and turn down from the pressure of the cutting. The teeth of the blade are similar to those of a common sickle, except that their angle is alternately reversed in spaces of one and one-fourth inch, more or less, as at B^3, Fig. 4, on an inverted section, the object of which is to equalize the cutting in both directions as the blade vibrates, and more effectually to keep the blade free from choking by cutting itself clear of blades of wheat, &c., in both directions. The blade-case is secured to the two projections of the frame of the platform C at 7 7 7 7, Figs. 1 and 5—say, three or four inches forward of the front pieces, C, of said platform—and it is supported between, at suitable distances apart, by two or three iron bearers, *e*, as shown in this cross-section, Fig. 3, screwed fast to the front piece of the platform C, and so bent downward as to let straw or blades that may get in work out.

The fingers D D D (twenty-seven in number, more or less) are made of bars of wrought-iron, (but might be cast,) about five-eighths inch square, one end of which is widened into a shape resembling a spear. These fingers are made fast in the frame of the platform C, and extend forward above the blade, so that the hinder angle, *d*, Fig. 5, of the spear is just behind the serrated edge *b* of the blade B, thereby forming an acute angle between the edge *b* of the blade and the shoulder *d* of the spear, by which the grain is prevented from yielding to the touch of the blade B as it vibrates, and is held fast, so that the cutting is insured, and that, too, dispensing with the under part of the finger, (as with the double bearer or finger,) on which blades of grass, &c., are liable to lodge and choke the machine. The fingers are intended to fit pretty close to the edge of the blade, and to be bent up a little from the back to prevent choking, as at B′ B^2, Fig. 3. The blade may either cut on a level with the upper surface of the platform or below it, as at present constructed.

Next, the driver F (or connecting-rod) is made of two pieces, F′ F^2, put together with screw-bolts, and so hollowed out in the inside, as at *f f*, Fig. 8, as to receive round or cylindrical followers G G G, in which the wrist of the crank I I I revolves, to be kept tight on the crank by the key 10, Fig. 6, instead of flat ones, by which arrangement they are enabled to roll in the driver, so as to accommodate themselves to any angle of the crank, varied by changing the height of cutting, thereby dispensing with extra followers to suit different sets of the machine and the trouble of changing them. The machine is at present constructed for two heights of cutting, eight and ten inches, (might have more variations,) which is effected on the out or tongue side by two joints in the frame-work—one at the crank or connection of the hounds N N and platform C Y V V, the other at the connection of the hounds and tongue P O O Z—the two bolts Y and Z being pivots to the two joints, and the axle of the main ground-wheel at A in the two hounds a pivot on which to turn the frame to

effect the change required. When the bolts V and O are in the lower holes of the hounds and tongue, the height of the blade from the ground will be eight inches, which is the lowest. The point of the tongue being fixed and immovable by the breast-piece Q, made fast to the horse's hames by moving the bolts V and O into the holes V and O of the hounds and tongue upon the pivot A, as before described, the hounds, together with the wheels, crank, and other frame-work attached to them, will turn, sinking the joint O O Z and raising the joint Y V V, and consequently the blade, to ten inches. By this operation the horizontal position of the platform and of the blade and driver, they being attached by a pin at 11 11 11, Figs. 1, 5, and 6, is preserved, while the turning of the hounds, crank, &c., as aforesaid, varies the angle of the crank to the blade and driver, and but for the rolling of the followers in the driver, as before described, would twist the blade.

The application of the fly-wheel H upon the axle of the crank I above the wrist, by which means the weight of the driver is counterbalanced, (one side of the wheel being heavier than the other), the changes of action in the blade regulated and effected with more ease, less friction, and strain upon the machinery, and consequent liability to wear and get out of order, and from which uniformity of action and resistance the action of the blade and wheels is kept up in situations where otherwise it would fail by reason of the wheels slipping and not revolving.

The manner of ungearing the machine by the lever J, so that when it is moving and not cutting the operation of the wheels and blade can be stopped conveniently. This is effected by securing the lever to the top of the out hound by a screw-bolt, B, which serves as a fulcrum. One end of the lever extends—say four or five inches—back from the fulcrum to a suitable place, and is suitably shaped as a box, in which is placed and acts the lower end of the axle *g* at the pinion of the wheel L, that operates the crank, and on and near the lower end of which said axle is a pinion, M, of nine teeth, that gears into the master cog-wheel P of thirty teeth. At some twelve inches before the fulcrum is a loose pin, J^2, put through the lever and into the hound, which holds it firmly to its place. To ungear the wheel it is then only necessary to take out this pin and move the end of the lever in toward the master cog-wheel, which moves the other end with the pinion out of gear; and the pin being put again into the lever and a different hole in the hound, it is kept out of gear until changed, as before. This is important in moving the machine from place to place; and also in cutting around a piece of grain it sometimes does not suit so well to cut on one side as on others.

The divider K is an extension of the frame on the left side of the platform—say three feet before the blade—for the purpose, and so constructed as to effect a separation of the wheat to be cut from that to be left standing, and that whether tangled or not. E is a piece of scantling—say three feet long and three inches square—made fast to a projection of the platform by two screw-bolts. To the point of this piece, at K, is made fast, by a screw a bow, L, of tough wood, the other end of which is made fast in the hinder part of the platform at R, and it is so bent as to be about two and a half feet high at the left reel-post and about nine inches out from it, with a regular curve.

The dividing-iron M is an iron rod of a peculiar shape, made fast to the point of the same piece E and by the same screw-bolt that holds the bow K. From this bolt this iron rises toward the reel S at an angle of, say, thirty degrees, until it reaches it, then it is bent so as to pass under the reel as far back as the blade, and to fit the curve of it, (the reel.) From the bolt in the point aforesaid the other end of this iron extends—say nine inches—along the inside of the piece E, where it is held by another screw-bolt, M′, and where it has a groove or slot in it to admit the other ends being raised or lowered (turning on the point-screw K as a pivot,) to suit the height of the reel. By means of the bow to bear off the standing wheat and the iron to throw the wheat to be cut within the power of the reel the required separation is made complete.

The manner of constructing the hounds N N (or main wheel-pieces) and of connecting them with the tongue P and forming the movable joint O O Z, as before described, corresponding with the joint Y V V in changing the height of the cutting, by which construction, too, the frame is greatly simplified and strengthened, sufficiently so to control the action of the machine firmly and permanently (the inside hound operating as a direct and strong brace to it) by means of the tongue P, which is extended, say ten feet, forward, so as to balance the machine upon its two ground-wheels, T and U, and is attached to the breast-piece Q, as before described.

The reel-post R, (on the left side of the machine,) instead of being placed before the blade, standing perpendicularly and braced as before, is set, say, nine inches behind the blade, as at U, and so leaned forward as to bring the middle of it or point R, at which the end of the reel is supported, to its former perpendicular, thereby, too, so putting the top of the post V forward as to admit of being braced directly to the tongue P by means of the tongue-post T, for the purpose of raising the end of it a little by the brace S, passing partly over and in front of the reel. By this arrangement, first, the bracing, as described, is effected with much more simplicity and strength; and, secondly, the lower end of the post at U, being behind the blade and crooked out, as at R^2, (the end of the dividing-iron at *m* being bent inward,) all tendency of straw hanging upon it (the post) and interfering with the cutting is removed. The top of this post and front brace S might be dispensed with by making the frame

of the platform heavier and stronger, but it is believed not so well as at present constructed.

The manner of attaching the small ground-wheel to the left side of the platform, as at U, Fig. 2, by having different holes in the frame as at U′, for varying the height (by changing the axle of the wheel in them) of the cutting, and cutting away the under side of the frame at *n* behind the axle, to prevent the collecting of earth and gravel by the upward motion of the wheel, so as to stop its revolution.

The manner of attaching the sand-board W W to the frame between the main ground-wheel and the other wheels, driver, &c., by constructing it of two pieces at right angles to each other, the piece *w* being placed between the ground-wheel and master cog-wheel, and made fast by the bolt V, the other part, W, tapering between the ground-wheel and driver, and made fast to the brace *q;* and, lastly, the straw-board X, made fast to the wheel-post *r* at *r* and to the brace at *q*, for the purpose of keeping the grain from the wheels, driver, &c.

I claim—

1. The curved or angled downward (for the purpose described) bearer for supporting the blade in the manner described.

2. The reversed angle of the teeth of the blade in the manner described.

3. The arrangement and construction of the fingers or teeth for supporting the grain, so as to form the angular spaces in front of the blade, as and for the purpose described.

4. The combination of the bow L and dividing-iron M, for separating the wheat in the way described.

5. Setting the lower end of the reel-post R behind the blade, curving it at R^2, and leaning it forward at top, thereby favoring the cutting, and enabling me to brace it at top by the front brace, S, as described, which I claim in combination with the post.

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Witnesses:

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