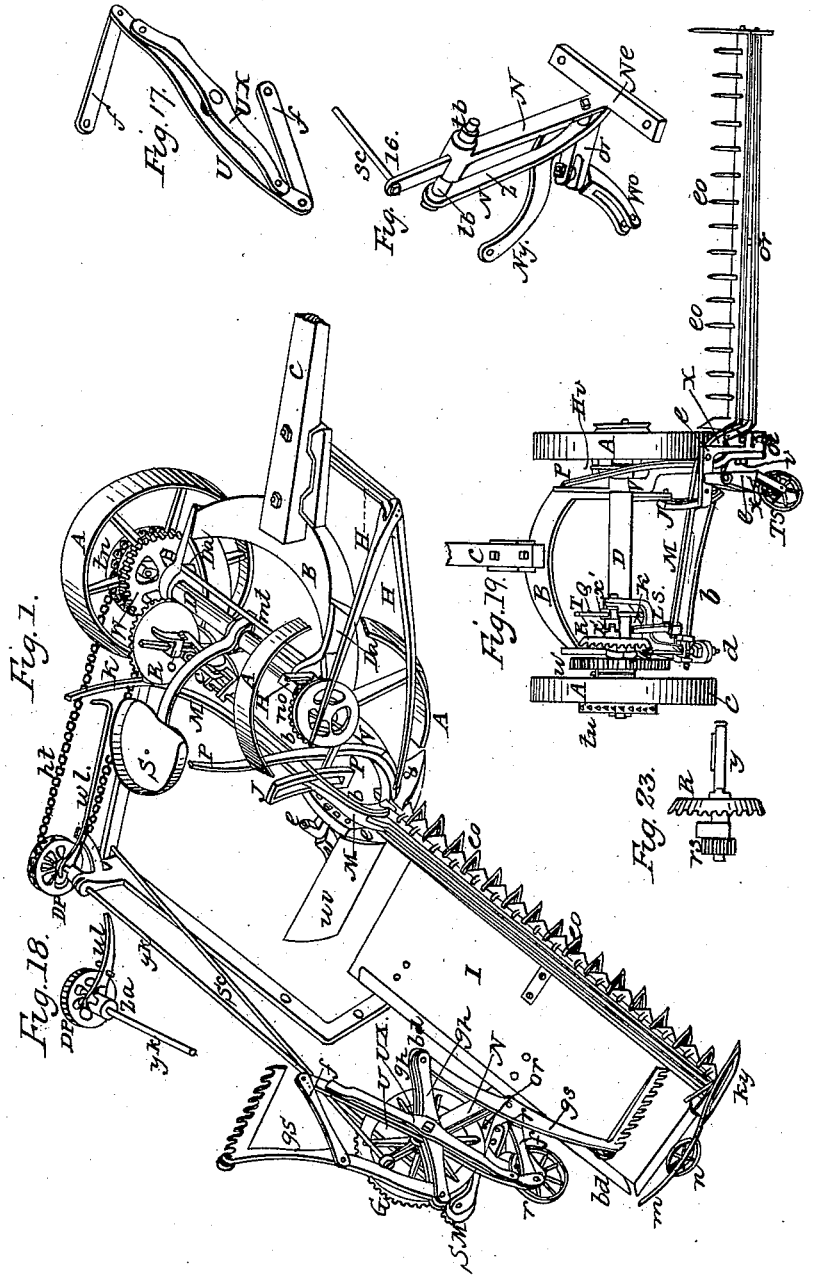
2 Sheets—Sheet 1.

E. T. FORD.

Harvesting Machine.

No. 52,701. Patented Feb. 20, 1866.



Witnesses:
Theodore Baker
A. Palmer

Inventor:
Elias T. Ford.

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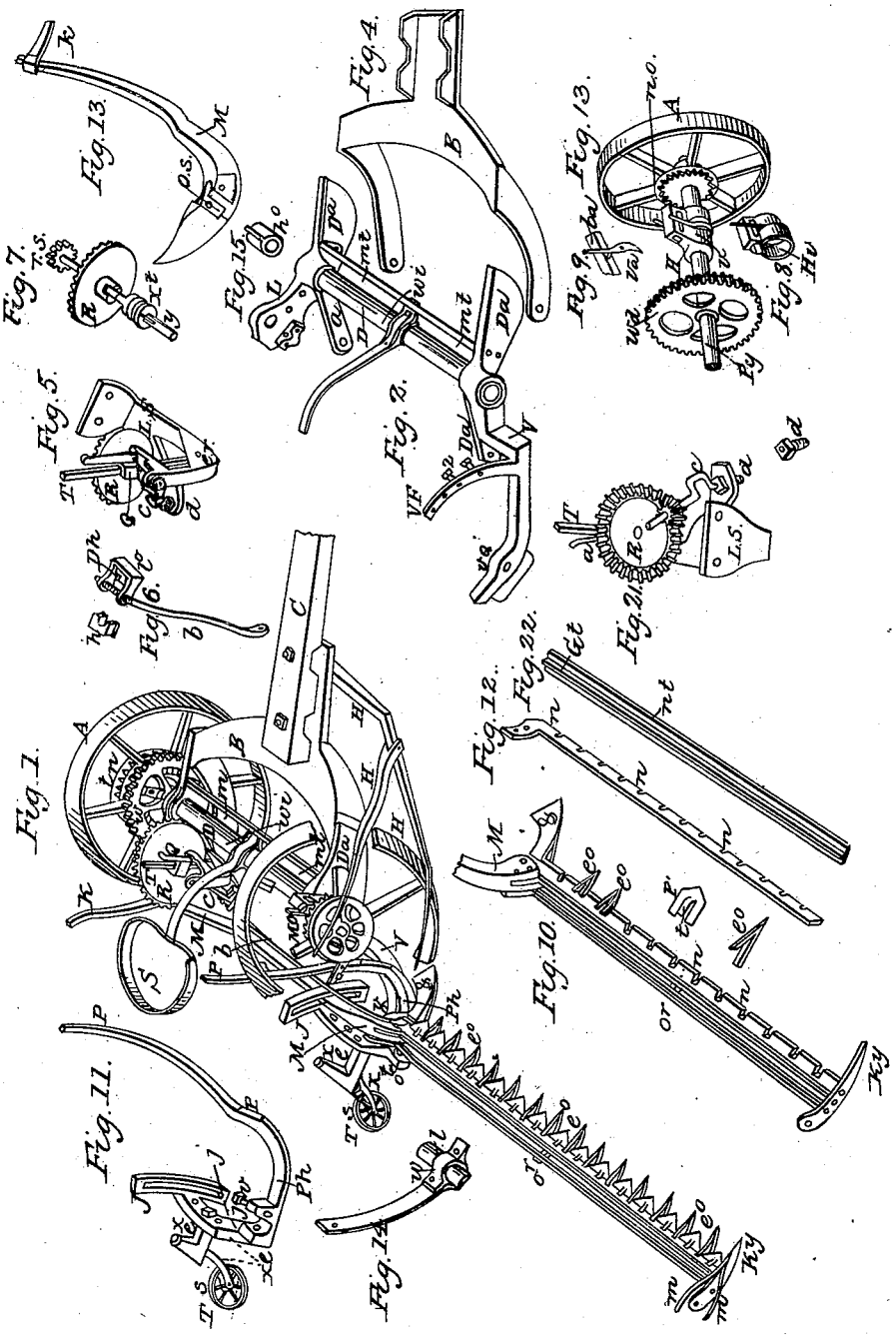

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Theodore Baker
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Inventor:
Elias T. Ford.

UNITED STATES PATENT OFFICE.

ELIAS T. FORD, OF STILLWATER, NEW YORK.

IMPROVEMENT IN HARVESTING-MACHINES.

Specification forming part of Letters Patent No. **52,701**, dated February 20, 1866.

To all whom it may concern:

Be it known that I, ELIAS T. FORD, of the town of Stillwater, county of Saratoga, State of New York, have invented new and useful Improvements in Harvesting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 in Drawing No. 1 is a side perspective view of the machine. Figs. 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 21, 22, 23 are detached sections of Fig. 1; and in Drawing No. 2, Fig. 19 is a top rear view of Fig. 1 as seen in Drawing No. 1, showing certain parts more distinctly. Fig. 23 is a detached section of Fig. 19, like letters referring to like parts in all of the drawings.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

Fig. 1 represents the drive-wheels A A, tube D, right and left hounds D *a* D *a*, arm L and V, with guide V F, seat S, with sleeve W *i*, yoke or pole-section B, with rods H H H, as also seen in Fig. 2. Fig. 1 further illustrates the drive-gear W, bevel-gear R, lever T, with slide Q, lever K, arm M, with cutter-bar, jack P *h*, composed of the lever P, flanges *i i*, bolt *v*, arm *c*, guide J, shank X *e*, caster-standard X, with wheel T S, as also seen in Fig. 11.

Fig. 6 represents the connecting-rod *b*, clasp *i o*, box *h*.

Fig. 5 represents the pillow-block L S, crank *c*, with adjustable step *d*.

Fig. 7 represents the multiplying-shaft *y*, semi-clutch X *t*, pinion *r s*, and gear R.

Fig. 21 is another view of parts as seen in Figs. 5 and 7.

Fig. 13 shows the arm M, with lever K and cavities.

Fig. 15 illustrates the tube-boxes *h v*.

The clutch H *v* is seen in Fig. 8, and the spring V *a*, with slide *b a* and pin, is seen in Fig. 9.

The axle P *y* is represented in Fig. 3 receiving the gear W, clutch H *v*, drive-wheel A, as arranged in Fig. 1.

Fig. 4 illustrates the pole-section B with orifices.

In Fig. 10 is seen the formation of the cutter-bar with steel guards *e o e o*, knife-section P near thereto.

Fig. 12 represents the front bar, *n n*, with guard-cavities.

In Fig. 22 may be seen the square steel bar G *t* upon a flat bar.

Fig. 14 represents the sleeve W *i* with the spring construction in Fig. 1.

By arranging the sectional parts as seen in the different figures I now contract the drive-gear W with clutch H *v* upon the axle P *y* to the left, so as to be adjacent to the ratchet *n o* of drive-wheel A, as seen in Fig. 3, and the clutch, as seen in Fig. 8, turned around, and the slide *b a*, with one spring, V *a*, and pin, as seen in Fig. 9.

I now insert the axle P *y*, with its parts, into the left side of or end of tube D, which is seen in Fig. 2. The box *h v*, as seen in Fig. 15, is inserted previous to the insertion of the axle P *y*.

The right arm V, containing the guide-bar V F, also right hound D *a*, are cast separate from the tube D, and are inserted upon the tube D after the seat-sleeve W *i*, as seen in Fig. 14, is inserted.

The sleeve W *i* is formed with two flanges, one taking a bearing underneath the tube D, and the sleeve W *i* is retained by the cross-bar *m t*.

The left hound D *a*, with arm L, may be cast with the tube D as a whole, or may be cast separate and then secured upon the left extremity of tube D.

I now connect the seat-bar *m t* to the hounds D *a* D *a*. The pole-section B, as seen in Fig. 4, is connected to the rear extremities of the right and left hounds D *a* D *a* by inserting a rod through the orifices provided within the hounds and section B underneath and in rear of the tube D and axle P *y*.

The jack or section P *h*, with lever P, flanges *i i*, hinge-bolt *v*, arm *c*, caster-shank X *e*, and caster X *s*, with wheel T S, is connected and arranged with the arm V, as seen in Figs. 1 and 2, by inserting the hinge-bolt *v* through the orifice *v o*, and secured to the arm V by a nut, producing the functions of a hinge, and the arm M, as seen in Fig. 13, with lever K turned over in order to show the locket O S, and with finger-bar attached, as seen again in Fig. 10, is located upon the flange *i* of jack P *h*, and held by a bolt, *o t*, forming a second hinge, as seen arranged in Fig. 1, the bolt *o t* passing through the rear flange, *i*, or lug formed with the arm *c*, composing the jack

P *h*, also the bolt *o t* passing through the orifices of the lower extremity of arm M and front flange or lug, *i*, of jack P *h*.

Upon the multiplying-shaft *y*, as seen in Fig. 7, I insert the bevel-gear R, formed with the semi-clutch at the hub thereof, and upon the same shaft *y* the corresponding semi-clutch X *t* is inserted, and is permitted to move horizontally on the shaft *y*, a feather being attached to the shaft *y* and a corresponding groove being made within the semi-clutch X *t* for the reception of the same. Another circular groove is cut within the left semi-clutch X *t* for the reception of a flange formed upon the hand-lever T, as seen in Figs. 7 and 5, arranged upon the pillow-block L S, with the shaft *y* and its bevel-gear R.

The lower extremity of lever T is pivoted to the lower portion of pillow-block L S. The slide Q is placed upon the lever T, descending to and locked with the side arm, E, of frame L S by a flange formed with the lower portion of slide Q resting within a corresponding cavity of side arm, E. The crank *c* is located with the adjustable step *d* of the rear and lower extremity of pillow-block L S, and upon the crank *c*, I locate the clasp *i o* with the semi-boxes *h h*, and retain the box so formed by entering the bent connecting-rod *b* through the rear extremities of clasp *i o*, as seen in Fig. 6, a thread being cut upon the left end of the rod *b* and a corresponding thread being cut within the extremities of the clasp *i o*. The rod *b* may be further secured to the crank *c* by allowing a nut to be located upon the rod *b*, one upon each side of the clasp *i o*. I now attach the clasp and rod *b*, as seen in Fig. 6, upon the crank *c*, as seen in Fig. 1, and I further arrange the pillow-block L S upon the arm L, and secure the same by two bolts passing through the orifices, as seen in Figs. 2 and 5. Fig. 21 also presents the bevel-gear R with the crank *c* and its bevel-pinion with pillow-block turned around, showing the adjustable step *d* with its thread, and a corresponding thread is cut within the lower extremity of the arm of pillow-block L S. The left portion of the multiplying-shaft *y*, as seen in Figs. 7 and 5, is to take its bearing within a box formed with the arm L. The orifice may be seen in Fig. 2, or the bearing may be formed with the pillow-block frame L S upon the left portion, where it is affixed to the arm L of left hound D *a*. I now insert the right box *h v*, as seen in Fig. 15, within the tube D, and the right clutch H *v* upon the right portion of axle P *y*, as seen in Fig. 1, next to the right drive-wheel A and pulley, retaining the pulley by a pin. The clutches H *v* H *v* are fixed rigid to the axle P *y*.

The construction of the clutches H *v* H *v* may be seen in Figs. 9 and 8. The slide *b a*, with pin, is movable within its mortise, as seen in Figs. 8 and 3. An elongated mortise is cut through each side of the clutches for the movement of the pin or pins connected to the slides *b a b a*, projecting outward from each side. The spring or springs V *a* V *a* are fastened to the clutch H *v*, and so arranged as to press upon the pins of the slide or slides *b a b a*, thereby connecting the clutch thus formed to the ratchet *n o* of the master-wheels A A.

The rods or guards H H H are connected to the pole-section B with pole C, as seen in Fig. 1. The upper prong, H, may be connected to the lower prong, H, by a pin, and may be adjusted in order to guard the right drive-wheel A from grain or grass, as well as the lower prong.

Fig. 10 represents a portion of the main lever M, as seen again in Fig. 13, with the three bars composing the cutter-bar united to the lever M and shoe K *y* at their extremities, and again at their centers by the center tie, *o r*. The center bar is bent edgewise at the left end and located within the cavity provided within the lower portion of lever M, as seen in Fig. 13, also arranged with front and rear bars, as before stated in Figs. 10 and 1. The rear bar is bent in a similar manner, only it being bent so as to lie flat or horizontal to that of the center steel bar, and is attached to and at the rear of arm M and center steel bar by two bolts which pass through the bar and arm M.

Fig. 12 illustrates the front bar, *n*, so bent at right angle as to be placed in front of the steel center bar. The left extremity is so bent downward as to pass underneath the lever or arm M and center and rear bar adjacent to the shoe, and attached thereto. The two bars *n n n'*, front and rear, are secured to the shoe K *y* by nuts. Their extremities are reduced in size, forming shoulders to each, and coming in contact with the shoe K *y*. Also, the center steel bar is formed with a shoulder similar to the front and rear bars. A tension is effected upon the front and rear bars by their nuts. The grain-dividing rods *m m* are united to the shoe K *y* at the front of the same.

The guards *e o e o e o* are punched or cut from sheet or plate steel in form as seen in Fig. 10, located within the cavities provided within the front bar, *n n*, and are retained to the same by small bolts, pins, or wedges passing through at the side of each guard *e o* and cavity of the same. The cavities of the front bar may be beveled at the top and bottom surface or edges, that as the guards are each inserted may be upset or compressed to and filling the cavities of the front bar, *n n*, or any other mode may be adopted known to machinists. Two incisions are made within the knife-sections P′ P′, and the middle is so bent as to form an elevated center, *t*, or tongue provided for the reception of the knife-bar within each. One section, P, may be seen in front of the cutter-bar in Fig. 10, with one guard, *e o*, near it, and as arranged upon knife-bar and front bar, *n n*, as seen in Fig. 1. The left shoe is united to the front bar, *n n*, and lower portion of the arm M.

Fig. 19, as seen in Drawing No. 2, represents a rear top view of the machine, showing the

arrangement and construction of certain parts more perfectly, as before alluded to in Fig. 1, Drawing No. 1. A portion of the hand-lever K is left off in order to show the multiplying-shaft *y*, semi-clutch, and bevel-gear R, a portion also of the shaft *y*, with the drive-pinion *r s*, being left off, but illustrated in Figs. 7 and 23.

The second hinge-bolt, *o t*, is seen in Fig. 19, also presenting the location and arrangement of the crank *c* with its bevel-pinion, clasp *i o*, with box *h h*, connecting-rod *b*. Fig. 23 also illustrates the shaft *y* with its feather, bearing, and drive-pinion *r s*.

Fig. 22 illustrates an iron finger-bar, *n t*, with a rib, G *t*, or square steel bar riveted to the top of the same, near the center, as a stiffening-bar.

Operation: As the drive-wheels A A each turn upon the main axle as their bearings the motion is communicated to the knife P by the clutches, with their slides *b a* passing each into the ratchets *n o n o* of drive-wheels A A, so that one or both wheels A A move the main axle with large spur-gear W, and this gear moves the pinion *r s* and larger bevel-gear R, connected to and moving the smaller pinion with the crank *c*, rod or pitman *b*, and knife-sections P′ P′. The motion can be connected or disconnected to the crank *c* by moving the slide Q upward, and then also moving the hand-lever T right or left. Then dropping the slide Q′, it enters its cavity provided within the side frame of pillow-block L S, which retains the lever T in either position. It can be disconnected also by changing the springs V *a* V *a* of clutches H *v* H *v* upon the opposite sides of the pins that pass through the slides *b a b a*, thereby preventing the slides *b a b a* from coming in contact with each ratchet *n o n o* of drive-wheels A A.

The connecting-rod *b* may be used to contract or lengthen the position of the knife-bar to crank *c* by turning the rod *b* within the clasp *i o*.

The finger-bar may be graduated by means of the pin or pins Z, or other equivalents in form of a catch made upon the guide V F adjacent to the lever P of jack P *h*, thereby adjusting the position of the cutter-bar so as to relieve the drag of the cutter-bar upon the ground, causing the weight of a portion to come upon the caster-frame X C and wheel T S and the right drive-wheel A. The cutter-bar, with lever or arm M and hand-lever K, as seen in Fig. 1, form a continued lever, the hinge-bolt *o t* being a fulcrum by which the cutter-bar is elevated or depressed. By pressing the hand-lever K to the left and downward the bar is elevated, and by removing the pressure the cutter-bar is depressed by its own gravity and is permitted to conform to the uneven surface of the ground, and it may also be elevated at the heel by the jack P *h*, lever P, and caster T S by moving the lever P to the rear, causing the hinge-bolt *v* as a center to turn within the orifice V Q, as seen in Figs. 2 and 11 in Drawing No. 1 and Fig. 19 in Drawing No. 2, the caster-wheel T S of jack P *h* being one extremity of the lever P thus produced, and is used in elevating the cutter-bar at the heel. Consequently a double movement at the heel is effected in this arrangement equivalent to all the operation necessary in passing over stones, stumps, or other objects, and allowing the knife at the same time to continue to vibrate. And by hinging the pole-section B to the right and left hounds D *a* D *a* in rear and below the center of tube D, axle P *y*, a necessary draft or downward pressure is produced upon the arm V, jack P *h*, and cutter-bar, so as to prevent the same from raising, but, on the contrary, to hug the ground in its operation, producing no additional draft or pressure upon the necks of the horses, only the weight of the pole and section B. And the right drive-wheel A, with the caster-wheel T S of jack P *h*, guide the bar and cause it to surmount stones or other objects, and without affecting the free movement of the knife-bar or any portion of the whole machine. The rear arm, X *e*, which forms a portion of the jack P *h*, can be adjusted by removing it either to the right or left upon the jack-frame *e*, different orifices being provided for the reception of the same, and is retained by a nut, as seen in Fig. 11, Drawing No. 1. In mowing this arm X *e* is removed to the right, so as to be upon a line with the jack P *h*.

Having thus described the invention set forth in this specification, what I claim, and desire to secure by Letters Patent, is—

1. The tube D, provided with end boxes, *h v h v*, and seat-sleeve W *i*, in combination with the arm L, left hound D *a*, arm V, with adjusting-bar V F, catches Z, and cross-bar *m t* of hounds D *a*, substantially as described.

2. Hinging the pole-section B to the rear extension of left and right hounds D *a* D *a*, formed upon and arranged in relation to the tube D and main axle P *y* as seen in Fig. 1.

3. The jack P *h*, as composed of lever P, flanges *i i*, hinge-bolt *v*, guide J, arm *c*, shank X *e*, in combination with the caster-standard X and wheel T S, hinged upon the lower extremity of arm V by the pivot or hinge-bolt *v* at the orifice V Q.

4. The lever M, provided with the cavities *o s*, formed within the lever or arm M, for the reception of flange *i*, and the steel center-bar, and as connected to rear and front bar, *n′ n n*, in combination with the guide J and lever K, for elevating and depressing the cutter-bar pivoted upon the jack P *h* by the bolt *o t*.

5. In combination with the arm L, supporting the pillow-block L S secured to the tube D, the arrangement of the hand-lever T, pivoted below the multiplying-shaft *y* to the pillow-block L S and provided with the slide Q, in the manner and for the purpose specified.

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