2 Sheets—Sheet 1.

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No 6,034. Patented Jan'y 16, 1849.

Fig. 1

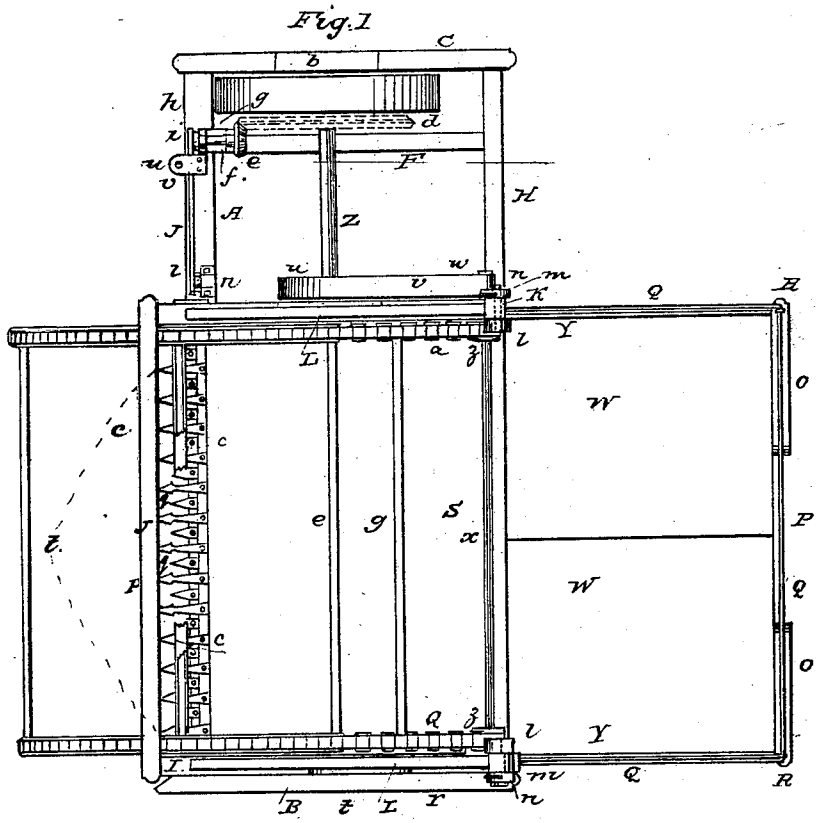

Fig. 2

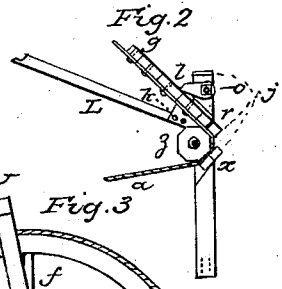

Fig. 3

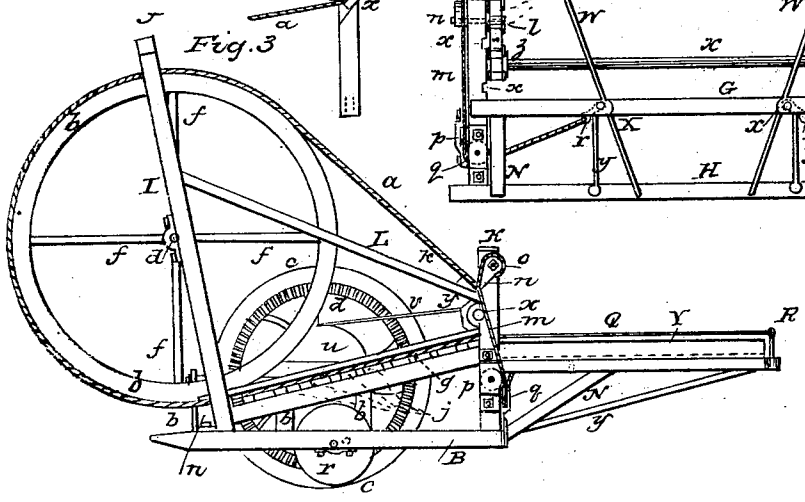

Fig. 9

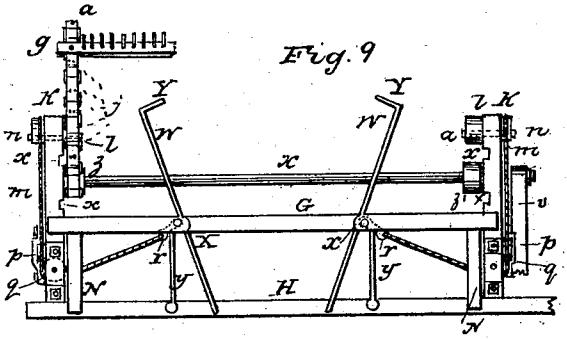

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Fig. 4

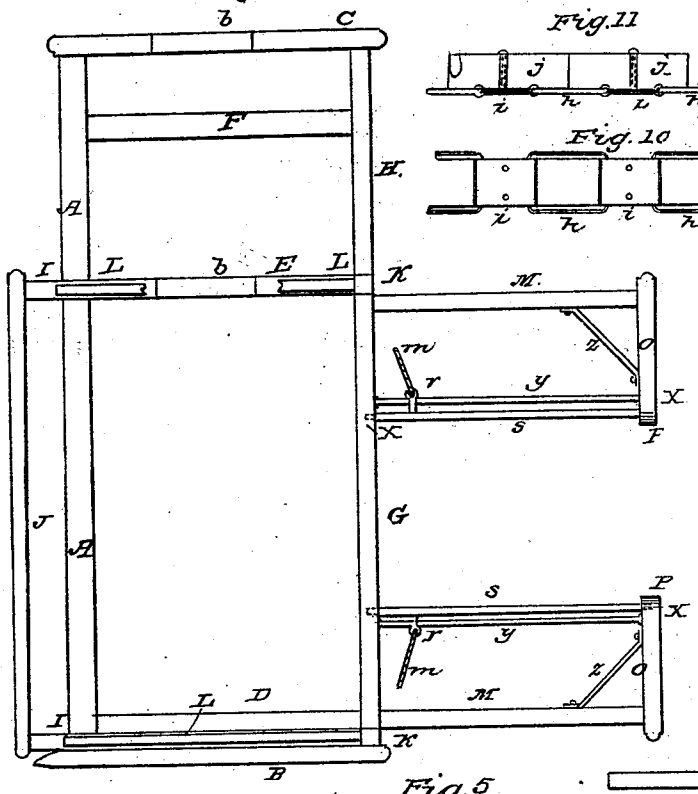


Fig. 11

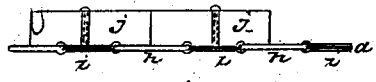


Fig. 10

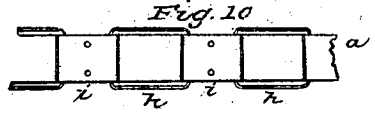


Fig. 8

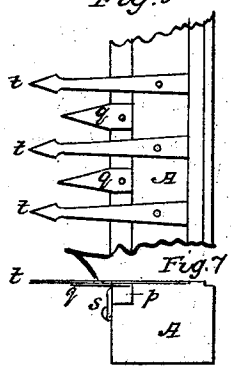


Fig. 7

Fig. 8

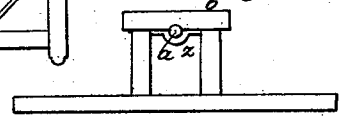
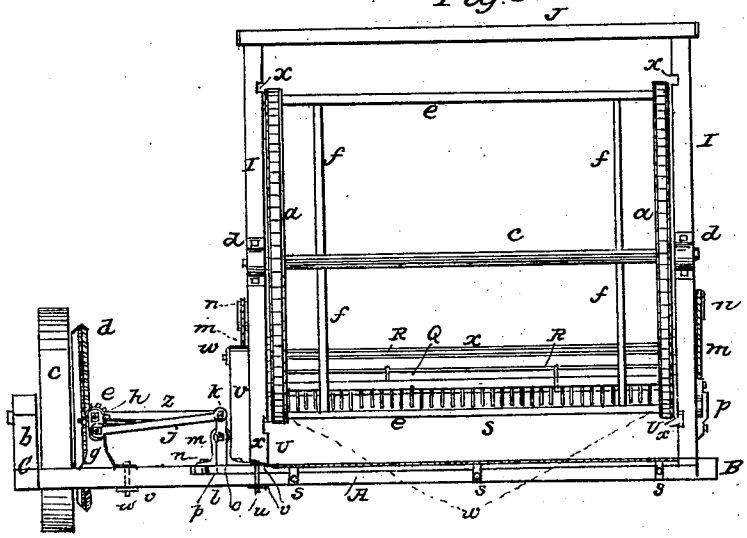


Fig. 5



N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

OLIVER BARR, OF AURORA, ILLINOIS.

IMPROVEMENT IN HARVESTING-MACHINES.

Specification forming part of Letters Patent No. **6,034**, dated January 16, 1849.

To all whom it may concern:

Be it known that I, OLIVER BARR, of the town of Aurora, county of Kane, and State of Illinois, have invented a new and useful machine designed for reaping and bundling wheat and other kinds of grain, of which I do declare the following to be a full and accurate description.

In order to explain the construction of the various parts and the combined arrangement and operation of said machine, I refer to the annexed drawings, in which the same letters indicate the same parts throughout.

Figure 1 is a bird's-eye view of the machine; Fig. 2, an inside sectional side elevation of one of the rear short posts, K, showing the chain bands or belts *a*, with the cam-blocks *j* attached, as they pass over the angular pulleys *z* to the short inclined planes or fixed wedges *k* and under the cam-levers *l*, which effects the dropping and bundling of the grain in the manner hereinafter described; Fig. 3, a side elevation view of the entire machine; Fig. 4, a top view of the frame-work of the same, showing the cords *m* attached to the hooks *r*, which are fixed in the under sides of the rock-shafts *s*, that are also shown; Fig. 5, a front elevation of the same, including the machinery; Fig. 6, an enlarged sectional top view of the breast-beam A and the fixed sickles *t* fastened thereon and the vibrating sickles *q* arranged upon a portion of the reciprocating sickle-bar *p*; Fig. 7, a cut section end view of said breast-beam A and an edge view of the sickles *q* and *t*; Fig. 8, a side elevation of one of the inverted hangers or supporters *b* of the gearing-shaft Z; Fig. 9, an end elevation of the horizontal or falling platform W in the position of dropping the grain by means of the parts hereinafter described in detail; Figs. 10 and 11, enlarged surface and edge views of the chain-band *a*, showing the open square links *h* and the loop-links *i* with two of the cam-blocks *j* attached.

I will now proceed to describe the parts of said machine in detail in the order of their arrangement and operation.

The frame-work, which is formed principally of wood, is constructed substantially as follows: the breast or sickle beam A, two outside beams, B and C, and two inside beams, D and E, one short lateral inside beam, F, one upper middle cross-rail, G, and one under middle cross-rail, H. At the front end of the beams D and E stand two long posts, I I, supported by a cross-cap, J. Directly opposite, on the end of said beams D and E in the rear, stand two short posts, K K, supported near their tops by two long braces, L L, which extend to I I. From near the centers of K K two side rails, M M, extend horizontally rearward, supported underneath by two short braces, N N, and upon their ends is secured a cross-rail, O, with a portion of its center cut away at P, having its inner end supported by the iron braces *y* and *z*, as seen in Figs. 1 and 4. An additional support to this part of the frame-work is afforded by an iron railing, Q, passing quite around from K to K, supported by the standards R R. From the beam A to cross-rail G, and supported upon the same, extends an inclined board flooring or platform, S, inclosed at each side by a curb or side-board, T, which is rabbeted into the inner faces of I and K. Directly over each of these side-boards T, and lateral with the same, and secured at its ends in and to the same posts, is placed a light guide-rail, U, so as to leave an opening or slot, V, about one inch wide, more or less, between it and the top of the side-board T, as shown in Fig. 3. In the rear of said inclined platform S, and of about the same area, is extended a horizontal platform divided lengthwise into two flaps or trap-doors, W W, which are suspended nearly in their centers upon the rock-shafts *s*, the end journals of which are supported in boxes or bearings in G and O, said flaps being so arranged as to open downward in the center by means hereinafter described. These flaps are also provided with side-boards Y Y, which are secured to and elevated upon their outer edges, as shown in Fig. 3 and end view, Fig. 9. Upon the left-hand side of said machine (viewing it in front) is extended a horizontal platform or frame-work formed of one end of the breast-beam A, one side beam C, the lateral side beam E, and short lateral beam F, and cross-rail H. Upon this portion of the frame is supported the propelling-gearing of the machine, the main shaft of which is indicated by the letter Z, and is suspended in boxes *a a* in the stanchions or standards *b b*, which are shown in the side elevation Fig. 8, and are based one upon the outside beam C and the other upon the lateral inside beam E.

The above description comprises the princi-

pal parts of the frame-work of said machine; and I will now proceed to describe the propelling and operative machinery of the same.

Upon the main shaft Z, near its outer end, is fixed the large truck-wheel *c*, which is the principal supporting carriage-wheel and conductor of power to the whole machinery, the propelling-power being produced by the resistance of the surface of the ground against its periphery when the machine is drawn forward. Upon the same shaft Z is fixed a toothed bevel-wheel, *d*, somewhat less in diameter than *c*, which gears into the corresponding pinion *e*, which pinion is keyed upon the inner end of a short horizontal shaft, *f*, which is supported in two bearings in the standard *g*, said standard ranging lengthwise with the machine at right angles with A, and being bolted down partly upon each of the beams A and F, as shown in Figs. 1 and 5. Upon the outside or front end of said pinion-shaft *f* is fixed a crank, *h*, on the crank-pin of which is suspended one end of a horizontal pitman, *j*, the opposite end of which is pierced by and acts upon the pin *k*, which projects from the upper end of a pendulous lever, *l*. Said lever is suspended nearly in its center upon the stud *m*, projected from the standard *n*, which standard is bolted upon the beam A, as shown in Figs. 1 and 5. The bottom end of the pendulous lever *l* enters vertically into a mortise, as indicated by dotted line, at *o*, which is cut into the end of the reciprocating sickle-bar *p*, as shown in Fig. 5, giving the requisite sidewise vibrating motion to the short sickles *q*, which are let into recesses, and are riveted or screwed upon the upper surface of said bar *p* at right angles with the same, projecting horizontally forward between and close under the long fixed sickles *t*, and the said bar *p* is let into a rabbet cut in the front upper corner of the beam A, as seen in Figs. 6 and 7, where it is secured in front by the clamps *s*, and above by the long fixed sickles *t* aforesaid, which fixed sickles are spear-pointed thin plates of steel, made with a neck somewhat back of their points, and having horizontally-curved edges at their sides, against which the grain is forced or gathered and cut by the vibrating sickles *q* as they are moved by means before described.

The rear ends of the fixed sickles *t* are of a dovetail shape, and are let their thickness into the upper surface of the beam A, as shown in surface and end views Figs. 6 and 7, where they are firmly screwed down with their front cutting ends projecting forward at right angles with beam A and bar *p*, and on a line with and between the vibrating sickles *q*, extending some three inches beyond the points of the same, and both or either of the sets of said sickles may be serrated or sickle-edged. The long or fixed sickles *t* should be cut upon their upper edges with the teeth-points ranging backward in order to secure and cut the grain to advantage.

The next train of machinery in order begins with the large driving-pulley *u*, which is fixed upon the main shaft Z before mentioned, near its inner end. From this pulley extends a flat band, *v*, which passes around a small whirl or pulley, *w*, that is fixed on the outer end of the shaft *x*, which shaft is supported horizontally on journals resting in the bearings *y y* on the front face of the short posts K K, Figs. 3 and 5. Upon this shaft *x*, and near and between its bearings *y y*, there are two small angular or spur driving-pulleys, *z*, around which pass two bands or endless chain belts, *a a*, as seen in Figs. 1, 3, and 5. These belts extend forward and pass around two large hoop-shaped reel-heads, *b b*, of a horizontal reel, the center shaft of which, *c*, is formed into journals at its ends, which run in opposite boxes or sockets made onto the outside faces, near their centers of the long posts I I at *d*. Said reel-heads *b b* are supported by four horizontal connecting-rails, *e*, from which centripetally extend four cross-arms, *f*, at each end, which are tenoned into the center shaft, *c*, thus completing said reel, which extends horizontally from I to I, and which receives a forward rotary motion from said chain-band *a* about equal in a given time to that of the truck-wheel *c*, which motion of the horizontal arms of said reel throws the cut grain back upon inclined platform S, which ranges some inches below the sweep of said arms, where it falls with the butt-ends forward, and remains accumulating until removed by the revolving rake *g*, which is constructed and operated as follows.

I will first state that the chain-band *a* should be made in the manner represented in the enlarged surface and end views Figs. 10 and 11, which is the common flat chain-band, made of the square open chain-links *h* and connected alternately by the straps *i*, the ends of which are looped around the angles of the adjoining square links *h*, then lapped and double riveted in the center in the usual manner, as shown in Fig. 10.

The head of the rake *g* may be made of metal, or, if of wood, about the same proportions as the common hay-rake, and about six feet long, or of sufficient length to extend from one chain-band to the other, to the two opposite loops of which it is riveted, the rake-head ranging at right angles across the machine, with its ends *g* projecting about one inch outside of each band, which ends of the rake pass through in its revolutions the gaps *x* cut on the inside faces of the posts I I and K K. The teeth of the rake project outward from the chain-bands *a a*, and are of sufficient length to sweep the cut grain up from the inclined platform back onto the flaps of the horizontal or falling platform at each revolution of said bands around the reel *b*. Here terminates one branch of the second train of operative mechanism in this machine. The second branch of this train commences with the cam-blocks *j j*. These blocks, which are some five (more or less) in number, and of an oblong form, are riveted or secured centrally to an equal number of strap-loops *i* of

the band, as seen in Figs. 2, 9, and 11, the blocks being so much longer than the loops as to meet end to end about the center of the square links *h*, and form a solid bridge when the band is in a straight line. Consequently as the band carries them over and past the angular pulleys *z*, and over upon the inclined plane or fixed wedges *k*, which are fastened upon the inside of the braces L L near the the short posts, K K, and nearly over the angular pulleys *z*, the projections of the rake-head *g* being the leaders of the line of cam-blocks *j*, they force up the ends of the cam-levers *l*, which are kept up by the cam-blocks *j* until the whole number have passed by the impinging point, during which time the flaps or trap-doors W W, which form the horizontal platform, are held open downward, as seen in Fig. 9, in the position of dropping the grain, which operation is effected suddenly by means of the chain or cord *m*, the upper end of the same being attached to and passed over the lifting-lever *n*, which is raised with the cam-lever *l*, both levers being firmly fixed upon the same arbor *o* on opposite sides of the posts K K, through which posts said arbor passes horizontally. From said levers *n* the cords or chains pass down the outsides of K K, against the sides of the friction-pulleys *p p*, and around under the guide-pulleys *q q*, thence upward, where the ends are secured to the lever-hooks *r r*, which hooks project downward when the flaps are in a horizontal position from the rock-shafts *s*, in the under sides of which they are firmly inserted, consequently the upward draft of the cord *m* would force the trap-doors (to which the rock-shaft is firmly fixed) to a downward inclination in the same proportion that the hooks are drawn to a horizontal line. The cam-blocks *j* having moved past the inclined planes or wedges *k* as the machine is moved forward, the extra weight of the outside of the trap-doors W W forces them back to their former horizontal position, ready to receive the succeeding bundle of grain from the rake *g*, as before described.

The machine is supported and moved upon two wheels—namely, the large truck-wheels, *c*, (the location of which has been previously described,) and the small wheel, *r*, which is suspended on a separate axle, *t*, between the beams B and D, as shown in Figs. 1 and 3. The near end of the pole or tongue is firmly fixed by the bolts *u u*, or otherwise, in the the flanges *v v*, which are shown in Figs. 1 and 5.

The machine may be worked by one span of horses in ordinary crops; but in heavy reaping additional team may be required.

Having faithfully described the structure and arrangement of said machine, I will briefly recapitulate the progressive operation of its working parts in the lineal order of its mechanism.

Suppose the machine being moved forward by the team, with that portion of the breast-beam A on which the sickles are attached abutting against the standing grain, the motion of the large wheel *c* will then be transmitted through the shaft Z, the bevel-wheel *d*, the pinion *e*, the shaft *f*, the crank *h*, and pin *i*, the pitman *j*, and the pendulous lever *t* to the sickle-bar *p*, on which the short sickles *q* are fixed, and to which sickles it conveys a rapid horizontal motion back and forth, and by and between which and the curved edges of the long sickles *t* the intervening grain is seized and cut as fast as the machine is moved forward, which grain is thrown back upon the inclined platform S by the horizontal reel arms or rails *e*, which revolve in advance of the sickles, and consequently part and keep the uncut grain inclined backward over said platform S, from which it is moved up back onto the falling or bundling platform W W by the rake *g* at every revolution of the chain-bands *a a*. The motion which propels said rake and reel is derived from the main shaft Z, through the pulley *u*, the band *v*, the small pulleys *w*, the shaft *x*, the angular or spur pulleys *z*, and the chain-belts *a a*, which last pass around the heads *b b* of said reel, and to which the ends of said rake are fastened, as before described The motion which drops and bundles the grain, which is the next and last in order, is derived from the chain-bands *a a*, through the cam-blocks *j*, the cam-lever *l*, the arbor *o*, the lifting-lever *n*, the cord *m* around the friction-pulley *p*, and the guide-pulley *q* to the lever-hooks *r r*, which being fixed in the rock-shafts *s* and the shafts being riveted to the trap-doors W W, they are opened downward at every revolution of said cam-blocks *j*, and the grain dropped on the ground between said trap-doors or flaps in the requisite quantities or bundles, and lying together properly for binding.

In the construction and action of the above-described machine there are several mechanical features which I consider both novel and important: first, in the curved cutting-edges of the long fixed sickles *t*, which gather and hold the grain while being cut by the triangular sickles *q*, which form and arrangement effectually shear off the grain by means of a lateral motion, with the sickle-blades firmly and immovable fixed on their respective supporters, thereby obviating the wearing and expense of the pivot-joints and the tendency to force the grain forward uncut to be passed over by the machine, which are among the objections to the arrangement of sickles acting as shears on pivots heretofore in use; second, in the inclined plane S, by means of which the cut grain is elevated by the rake *g* to the bundling-platform W sufficiently above the cut stubble to allow it to be dropped in a collected bundle in a condition ready for binding, which could not be done if said rear platform were placed on a horizontal line with the sickles or breast-beam of the front platform, which platform, in order to secure the above advantages, I have made inclined, as above specified; third, in making the reel with the pulley-heads *b b* to

secure the chain-bands *a a*, and the revolving-rake *g* attached, by means of which, in connection with the guide-rail U, the grain is carried up said inclined back to said horizontal platform, W; fourth, in the arrangement of the wedge *k*, the cam-blocks *j*, the cam and lifting levers *l* and *n*, and the cord *m* in connection with the trap-doors W W, by means of which said grain is deposited in bundles ready for binding, as above described.

Believing that the above-mentioned peculiarities are my own original and exclusive inventions, and not used or known in any other machine for like purposes, I do hereby state my claims accordingly as follows:

1. The form of the fixed sickles *t* with the curved edges, in combination with the triangular sickles *q*, attached to the vibrating bar *p*, and operated substantially as hereinabove specified.

2. The combination and arrangement of the guide-rail U with the reel-heads *b*, the chain-bands *a*, the revolving rake *g*, and the inclined platform S, formed, applied, and used substantially as above set forth.

3. The combination of the trap-doors or folding platform W, for the purpose of forming and dropping the grain in a bundle, with the cam-blocks, inclined wedge, levers, and cord or other similar devices arranged and operated in substantially the same manner for attaining the same object.

OLIVER BARR.

Witnesses:

O. MACDANIEL,

BENSON S. COOPER.