

(No Model.)

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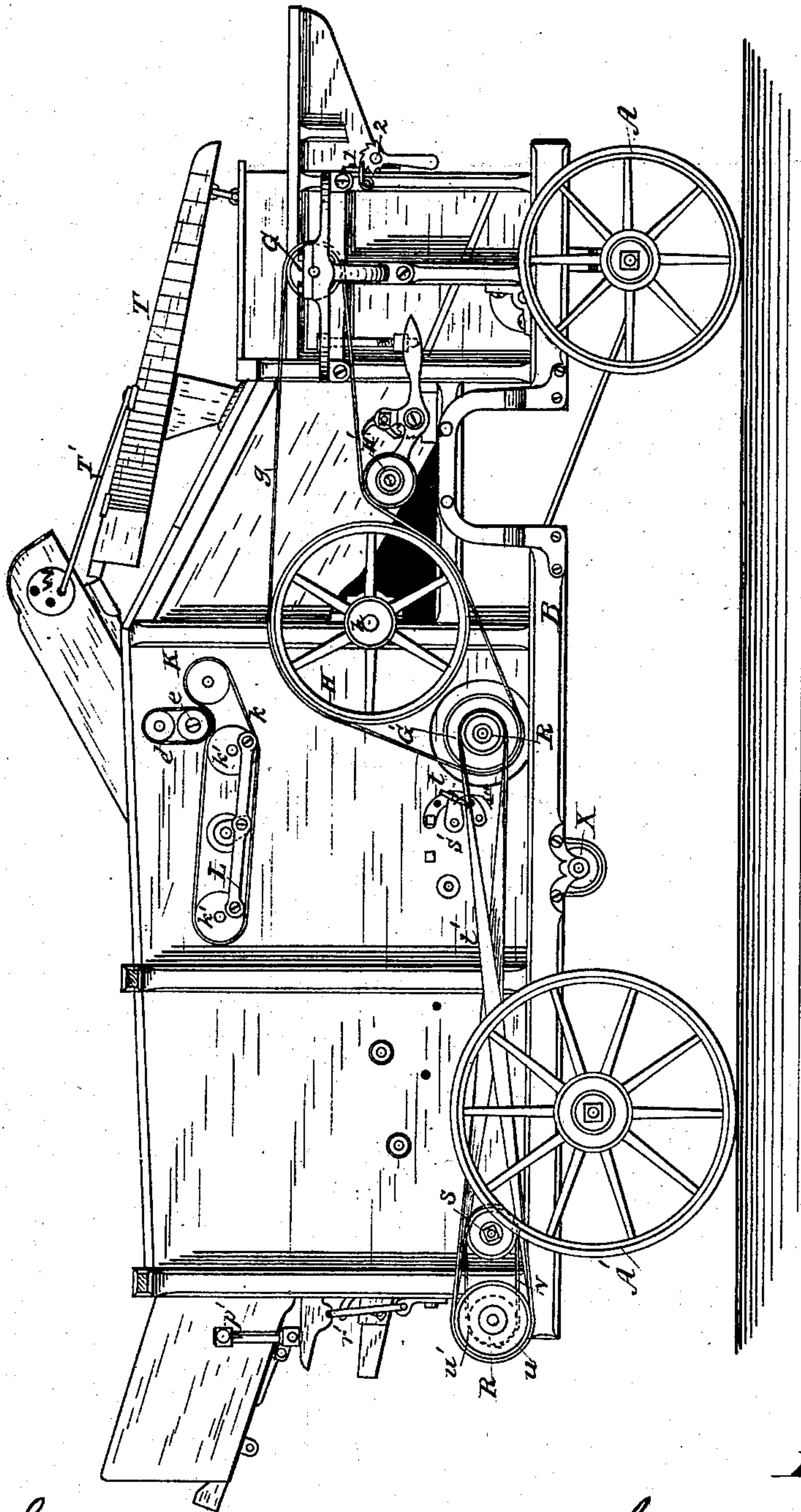
J. MILLER.

THRASHING AND SEPARATING MACHINE.

No. 261,867.

Patented Aug. 1, 1882.

Fig. 1.



Witnesses:

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(No Model.)

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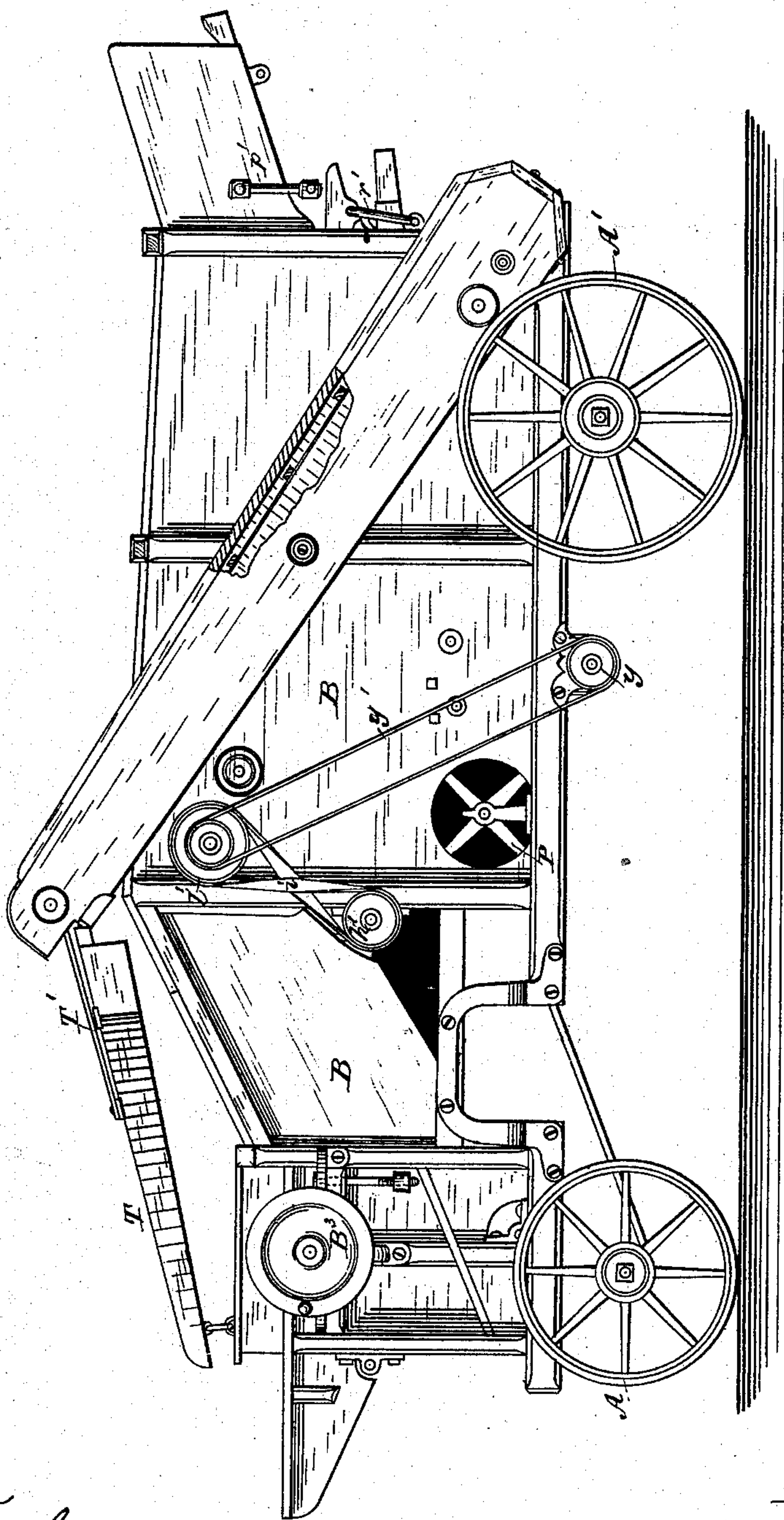
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Fig. 2.



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(No Model.)

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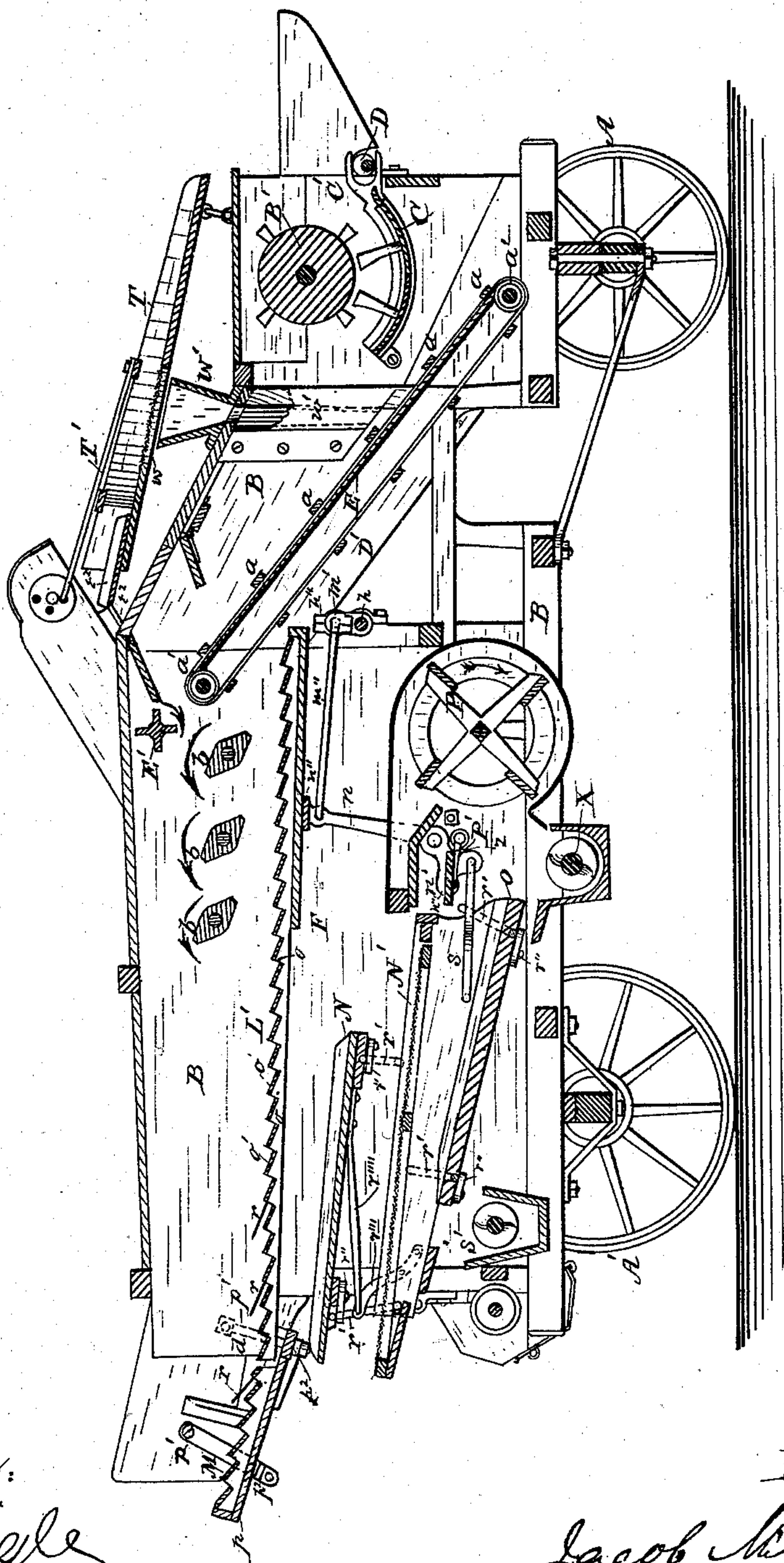
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Fig. 3.



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4 Sheets—Sheet 4.

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No. 261,867.

Patented Aug. 1, 1882.



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UNITED STATES PATENT OFFICE.

JACOB MILLER, OF CANTON, OHIO.

THRASHING AND SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 261,867, dated August 1, 1882.

Application filed June 20, 1881. (No model.)

To all whom it may concern:

Be it known that I, JACOB MILLER, a citizen of the United States of America, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Thrashing and Separating Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figures 1 and 2 represent opposite side views of my improved machine. Fig. 3 is a longitudinal vertical section of the same. Fig. 4 is a top or plan view.

The object of my invention is to provide a combined thrashing and separating machine which shall be simple and compact in all its parts and effective in its operation, as will be more fully set forth hereinafter.

In the drawings, A designates the front and A' the rear trucks, upon which is mounted the thrasher and separator.

B represents the general frame-work and casing of the machine.

B' is the thrashing-cylinder, journaled in suitable boxes or bearings, and to which power is applied by means of a belt or pulley, B³, which connects with the engine or other suitable power.

C is the concave, composed of segments of cylinders, armed with teeth in the usual manner, and secured in ways in the pivoted supports C', only one of which is shown in the drawings. The front ends of the concave-supports C' are slotted or bifurcated, so as to receive an eccentric shaft or cross-bar, D, whereby said concave is adjusted toward or from the thrashing-cylinder. The advantage of said adjustment is that light, dry, brittle straw is subjected more thoroughly to the thrashing

process by raising the concave, while more throat-room around the cylinder is given for long, wet, tough straw by lowering the concave, with less liability of choking or of winding the straw around the thrashing-cylinder.

The eccentric shaft D is provided with a pawl-and-ratchet device for holding the same in the

proper position, as shown at 1 and 2 in Figs. 1 and 4.

D' is an open carrier, which consists of two or more endless bands secured together by cross-bars *a*, and, if desirable, by diagonal strips of flexible material. This open carrier or endless band is supported and driven by the rollers *a'*, and the slats *a* are made flush with the bottoms or under sides of the belt, to which they are attached, so as to sweep the inclined floor E and carry the straw and grain upward and rearward to the overhanging beaters E', when the straw is deflected downward onto a series or gang of flat beaters, *b b*, to be operated on by them, while the grain falls down on the vibrating table or shaker F.

It will be observed that the open carrier D' and inclined floor E extend forward some distance past the rear edge of the concave C, so that straw, chaff, and grain are caught and carried up by the carrier, and thus the danger of clogging or banking up of the space in the casing at the lower end of the carrier with grain, chaff, &c., is obviated.

To the opposite end of the axis of the thrashing-cylinder from that to which the driving-power of the machine is applied is attached a band-pulley, G. A driving-band, *g*, passes over the pulley G and over a pulley, G', on the shaft of the fan P, by which power is applied to said fan.

Intermediate between the pulley on the cylinder-shaft and the pulley on the fan-shaft is a pulley-wheel, H, mounted on shaft *h*, which in turn is supported in proper bearings on the frame-work of the machine. The driving-band *g* passes over and under the pulley-wheel H, and is caused to drive said wheel by the belt-tightening device H'. To the opposite end of the shaft *h* is secured a pulley, *h'*, over which a band, *i*, passes, and which communicates power to a pulley, *i'*, on the end of the shaft or roller *a'*, for imparting motion to the carrier D'.

K is a pulley on the end of the shaft or roller *a'*, which imparts motion by means of a band to pulleys *k' k'* on the ends of the flat beaters *b b b*, said beaters to any desired number being connected together by means of a bar or rod, L, whereby a rolling beating motion is imparted to the under side of the straw in its

passage rearward and the loose grain beaten therefrom.

e is an idle-pulley secured to the side of the frame-work of the machine, over which a band, *e'*, passes. Said band also passes over a pulley, *m*, on the end of the axis of the overhanging beater *E'*, and imparts to the same a rotary motion by means of the impingement or frictional contact of the two bands *k* and *e'*.

A shaking or vibrating motion is imparted to the table *F*, and also to the shaker-board or straw-carrier *L'*, which is attached thereto by means of crank-arms *m'*, formed in the shaft *h*. To the crank arms *m'* are secured one end of the rods *m''*, the other ends of said rods being secured by means of hooks formed thereon in holes in the arms *n* of the bell-crank levers *n'*. The forward ends of the rods *m''* are weighted, as at *h''*, to balance the weight of the shaker *F* and carrier *L'*, so as to insure a uniform reciprocating motion. The bell-crank levers or castings *n* are made larger and heavier at their lower ends, so that their weight, together with the weight of the shoes and riddles, will be about sufficient to balance the carrier *L'* and table *F*. The enlarged portion or weight of the bell-crank lever is shown at *n'''*, Fig. 3. The arms *n* of the bell-crank levers *n'* are secured at their upper ends to a plate or bar, *n''*, which in turn is secured to the bottom of the shaker *F*, and by this means the shaker *F* and carrier *L'* are supported at their front ends and a reciprocating motion imparted thereto.

The carrier *L'* consists of a series of longitudinal strips, *o*, serrated, as shown in Fig. 3, to receive the cross-slats *O'*, which are set at an angle in the serrations, thus making the bottom of the carrier *L'* slotted or open, through which the grain is permitted to pass to the table or shaker *F* and to the separator below. The shaker or straw-carrier *L'* is flexibly connected to and supported at its rear end by a short section, *M*, of substantially the same construction, except in this, that the short section has a tight bottom board, *p*, attached thereto to catch any loose or light grain which may have found its way to the rear of the machine and conduct it back to the separator. The short section *M* is hung in swinging supports or arms *p'* *p'*, two on each side, and connected by supporting-bars *p²* *p²*, so that by the backward movement of the carrier the short section has imparted to it a tilting or up-and-down motion, which throws the grain from the bottom board, *p*, forward onto the vibrating table *N* of the separator. This increased vertical or up-and-down motion of the short section *M*, at the extreme end thereof, tends also to work off the straw faster. The straw-carrier *L* and short extension *M* of the same are armed with rearwardly-projecting spikes or pins *rr*, which take into the straw in their rearward movement to force it toward the rear end of the machine.

The vibrating table *N*, riddle *N'*, and shoe *O* are flexibly connected together and loosely

hung in the sides of the machine by rods *r' r'*, (which extend across the lower sides thereof, and are held in grooves provided for their reception by means of buttons *r''' r'''*), so as to admit of a vibratory motion being imparted to the same by means of rods *s*, which connect them to the bell-crank levers or castings *n'*. The shoes *O* and *N* are connected together by means of arms *r'''*, secured to the sides of the shoe *O*, and rods *r''''*, which connect the arms *r'''* with the shoe *N*.

P is the fan, the boards or bats of which are by preference fastened to the fan obliquely (not shown) for the purpose of admitting the blast more readily to the center of the fan, and thus distributing it to center of riddles or to where it is most needed. The fan *P* is driven by the belt *g*, as hereinbefore described, and in the direction indicated by the arrow, as shown in Fig. 3.

P' is a board pivoted or hung in the sides of the casing on bent arms *z*, secured to the side or edge thereof, and so arranged as to be raised or lowered, (instead of turning on central pivots, as heretofore,) and to be operated from the outside of the machine, and also capable of being secured at any desired height by means of an arm, *s'*, and set-screw *s''*, or other suitable device working in the perforated segment *t*. The object of hanging this board so as to be capable of being raised or lowered is to control the lower division of the blast of air from the fan *P* to any desired degree onto the shoe *O* for the better separation of the chaff and dust from the grain.

R is a small pulley on the end of the fan-shaft, over which a driving-belt, *t'*, is passed, and through which power is applied to the pulley *R'* on shaft *u* for driving the elevator which carries the tailings and unthrashed heads of grain back to the front of the machine.

A small pulley, *w'*, (see dotted lines, Fig. 1,) is secured to the shaft *u*, over which a band is passed to transmit motion to the pulley *S*, which is secured to the axis of an endless screw, *S'*, and by which the tailings are carried to the elevator.

The elevator is of the usual or of any desired construction. The discharging-spout, however, of the elevator possesses valuable points of construction and application, which I will now proceed to describe.

T is the discharge-spout of the elevator, the front end of which is loosely connected to the top of the cylinder-casing in any desirable manner, to allow said spout to have a vibrating movement imparted to it. The rear or upper end of the spout is connected to the elevator by means of a bent trough-like plate, *t²*, provided with side extensions, which take into grooves or under lugs formed in the spout; or the spout may be connected to the elevator in any convenient or desirable manner which will admit of the backward and forward motion of the spout. Vibrating motion is im-

parted to the spout by means of the rod T', which is connected to the trough and to a disk, W, on the end of the upper roller of the elevator. In the bottom of the spout T a screen, *w*, is secured, which allows the grain, chaff, and dust to fall through into the hopper W', and be conducted through the trough or spout *w'*, which is located behind the cylinder-post, down to the carrier D'.

As formerly made, the spout for the tailings, grain, chaff, &c., did not extend down to the carrier, but was admitted through a hole in the deck of the cylinder, and the objection to this construction is that the blast of air from the thrashing-cylinder drives the chaff, dirt, and dust back outside of the machine, to the annoyance and discomfiture of the operatives.

By extending the trough or spout nearly down to the carrier-web behind the cylinder-post the effect is that the draft created by the cylinder does not blow into and upward through the trough or spout to carry the chaff and dust out and scatter it about, but makes a suction-draft downward in the trough, which draws with it the dust and chaff and carries it back to the rear of the machine. The unthrashed heads of the grain are carried forward through the spout T and deposited in front of the cylinder to be again passed through the machine.

X is an endless screw for conveying the cleaned grain to the side of the machine to be put into bags. This screw is driven by power imparted to it through the pulley *y* and band *y'*.

What I claim is—

1. In combination with the carrier D', the overhanging beater E' and beaters *b b b*, whereby the straw and grain are deflected downward after they leave the carrier and upward and onward by the beaters *b b*, as set forth.

2. In a thrashing and separating machine, the combination of the short carrier D' and floor E with the overhanging beater E', beaters *b b*, vibrating table F, open straw-carrier L', and the extension M, arranged in the manner described and set forth.

3. The combination, with the shaking table or carrier L', supported at its rear end by the inclined links *d*, of the upwardly-inclined slatted extension M, supported at its front end by the links *d* and at its rear end by the links *p'*, inclined at a greater angle than the links *d*, whereby the straw is given an upward toss in discharging it from the machine and the grain thrown forward on the riddles, substantially as specified.

4. The combination, with the cylinder and carrier, of the trough *w'*, located immediately behind the cylinder-post and extending nearly down to the carrier D', whereby an upward draft from the cylinder is prevented from passing up through said trough or spout, as and for the purpose set forth.

5. The castings or bell-crank levers *n*, provided with the enlarged portions *n'''*, and in combination with a shaker or shakers, as described, to counterbalance the upper carrier.

6. The bell-crank levers or castings *n*, provided with enlarged portions *n'''*, in combination with the shoes O and N, riddle N', rods *s*, arms *r'''*, and rods *r''''*, whereby the weight of the shaker or carrier L' and table F is counterbalanced and the vibrating parts of separator nicely adjusted.

7. The combination of the shaft *h*, provided with the crank-arms *m'*, with the weighted rods *m'''*, table F, carrier L', bell-crank lever *n'*, rods *s*, shoes O and N, and riddle N', whereby all the parts—viz., the table F, carrier L', shoes O and N, and riddle N'—have a simultaneous and uniform reciprocating motion imparted to them, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB MILLER.

Witnesses:

HENRY S. FOGLE,
ROB. T. TONNER.