2 Sheets—Sheet 1.

R. H MONTEITH.

Combined Thrashing-Machine and Grain-Separator.

No. 212,041. **Patented Feb. 4, 1879.**

FIG. 1.

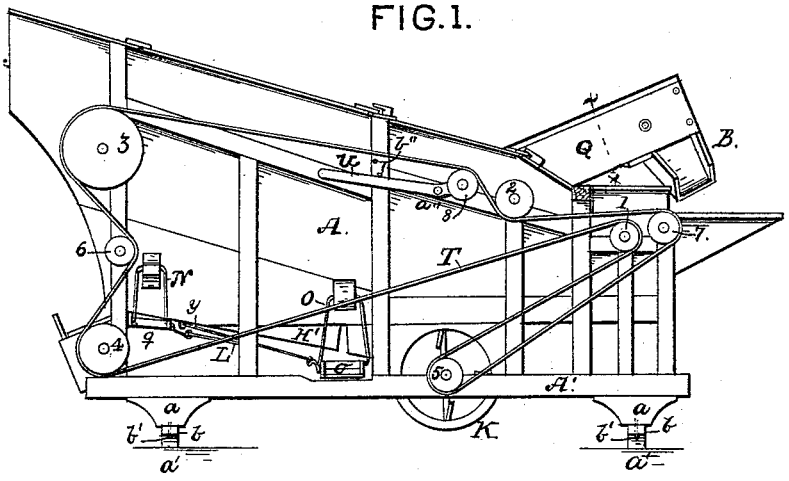
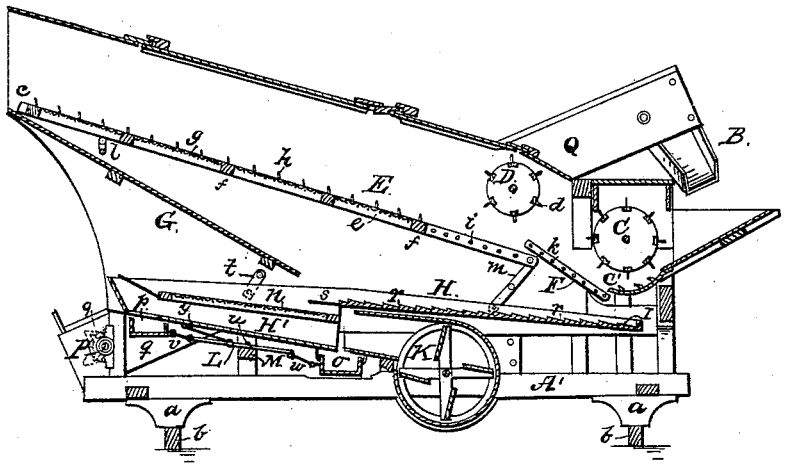


FIG. 2.



WITNESSES

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2 Sheets—Sheet 2.

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FIG. 3.

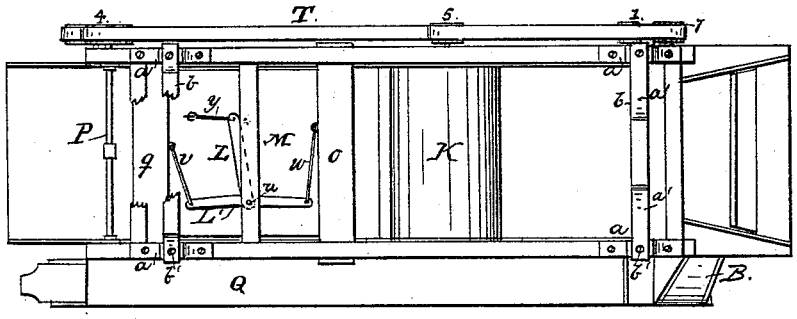


FIG. 4.

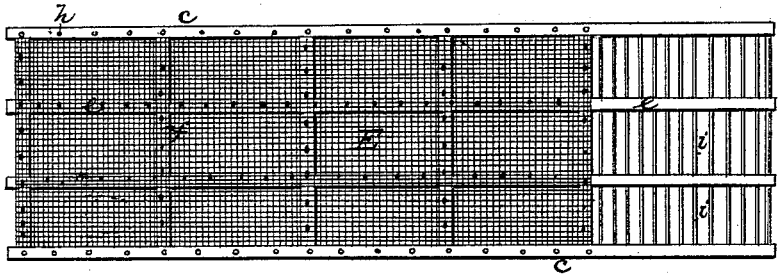
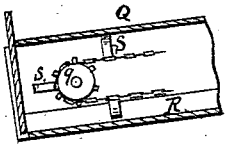
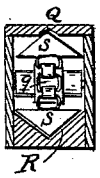


FIG. 5.





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UNITED STATES PATENT OFFICE.

ROBERT H. MONTEITH, OF EAU CLAIRE, WISCONSIN.

IMPROVEMENT IN COMBINED THRASHING-MACHINE AND GRAIN-SEPARATOR.

Specification forming part of Letters Patent No. **212,041**, dated February 4, 1879; application filed March 26, 1878.

To all whom it may concern:

Be it known that I, ROBERT H. MONTEITH, of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Combined Thrashing-Machine and Grain-Separator; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation. Fig 2 is a vertical longitudinal section. Fig. 3 is a bottom plan. Fig. 4 is a plan view of the separating-shaker or straw-carrier; and Fig. 5 is a cross-section, on line *x x* in Fig. 1, of the tailings-elevator.

Similar letters of reference indicate corresponding parts in both sheets of drawings.

My invention relates to improvements in combined thrashing-machine and grain-separator, and more particularly to improvements upon my former patent, dated November 27, 1877, and numbered 197,486; and it consists in an improved construction, arrangement, and combination of parts, substantially as hereinafter more fully set forth, and pointed out in the claims.

In the drawings, A is the frame-work of the machine, which is placed upon a rectangular frame-platform, A′. To each of the four corners of platform A′ are secured blocks *a*, to the lower ends of which are bolted cross-pieces *b b*, one at each end of the machine; and the ends of these cross-pieces which come immediately under the blocks *a*, to which they are secured, are sloped or beveled off, so as to free the bolt-heads *b′* from contact with the carrying-truck. By this construction of the supporting frame or platform A′ it will be lifted a sufficient distance from the ground to allow the front wheels of trucks to pass under the machine for convenience in lifting or turning whenever a change in the wind or other circumstances should render this desirable. This is further facilitated by making the end slopes, *a′ a′*, of the front cross-piece, *b*, longer than those of the tail-piece, so that the straight or flat middle piece of the front cross-piece, upon which the front part of the machine rests, shall be comparatively short, as compared with the corresponding part of the rear cross-piece, thereby forming, in a measure, a pivot, around which the tail end of the machine may be readily turned.

The upper frame-work, A, may be of any suitable construction for the support of the operating parts and box or casing of the machine within which these are placed.

At the forward end of the machine is the chute or incline, for feeding the loose gavels to the thrashing-cylinder C and thrashing-concave C′, both of which are of the usual construction.

Back of and a short distance above the thrashing-cylinder is placed a skeleton beating-cylinder or cylinder-picker, D, armed with teeth or beaters *d*, for the purpose of lightening up the straw as it comes from the thrashing-cylinder, to allow the grain to fall out, and shoving the straw forward upon the separating screen or shaker E. This latter consists of a rectangular wooden frame, *c c*, inside of which are placed longitudinal parallel bars *e* and cross-bars *f*, so as to form a firm support for the coarse wire screen or netting *g*. Arranged in rows on the side pieces, *c c*, cross-bars *f*, and longitudinal bars *e* are teeth *h*, which together form squares, and are bent backward, so as to present a slightly-inclined front.

The forward end of the shaker, which reaches in under the cylinder-picker D, has parallel iron rods *i i*, placed crosswise in frame *c c*, in place of the wire-netting, to receive the straw as it comes from the picker.

F is a grate or riddle, consisting of fixed cross-bars *k k*, which is placed back of the thrasher-concave to convey the straw and grain up under the cylinder-picker and in upon the separator, the forward end of which projects in under the stationary riddle F.

The rear end of the shaker or separator E is, on its under side, provided with boxes, through which passes the cranked shaft *l* of pulley 3, while the forward end rests in the upper bearings of the walking-beams *m*, centrally pivoted to the sides of the machine. It follows that when pulley 3 is operated an upward, backward, downward, and forward motion is imparted to the separator E, which first lifts the straw as it is being propelled forward by

the cylinder-picker, then sinks from under it, and on its next rise propels the straw forward and out at the tail of the machine, thereby arresting the downward passage of the heads of the grain, and thoroughly separating the loose grain from the straw.

G is the grain-slide, which is secured rigidly in the frame of the machine, under the shaker, and conducts the grain and chaff down into the shoe. This consists of a rectangular frame, H, having raised edges, so as to form a box or receptacle for the grain, in the rear end of which the sieve or riddle *n* is placed.

Instead of one sieve there may be several, differing in fineness of mesh, and these may be constructed and combined in any suitable manner, according to the grain operated upon.

Under the riddle or riddles *n* is the inclined bottom H′ of the shoe, which conducts the clean grain to the grain-spout *o*. This inclined bottom does not reach all the way to the rear cross-piece of frame H, but leaves an opening, *p*, for the passage of the tailings down into the tailings-spout *q*.

Into the forward end of shoe H is inserted, and rigidly secured, the grain-board I, which therefore forms an integral part of the shoe, and oscillates with it. The board or grain-floor I is grooved or notched crosswise, as shown at *r*, and has inserted into its rear end a series of projecting rods or wires, *s*, projecting backward up over the riddle *n*, to prevent loose straw and tailings from falling down into the grain-spout *o* below, and admit the blast from the fan-box K to pass up over and into the shoe.

The front end of shoe H, with its notched grain-board, is hung in bearings in the lower ends of the oscillating links or walking-beams *m*, already described, the upper ends of which support the forward end of the shaking separator and straw-carrier. The rear end of the shoe is hung in vibrating links *t*, secured to the inner casing of the machine, one on each side. It follows that a swinging forward-and-back motion is imparted to the shoe, with its grain-board, by the motion of the separating-shaker above, the shaker and shoe moving in opposite directions when the machine is operated.

A vibrating or reciprocating motion is imparted to the grain-spout *o* and tailings-spout *q* at right angles or transversely to the motion of the shoe H, and by the motion of said shoe, through the medium of a T-shaped oscillating lever, L, pivoted to the cross-bar M at *u*. Each end of the cross-piece L′ of this lever is connected by rods *v w* with the spouts *o* and *q*, respectively, while the lower end of its stem L is similarly connected with the inclined bottom H′ of the shoe. It follows that when the shoe moves forward and backward a vibrating motion is imparted to the T-shaped lever L′ L and spouts *o q* through the medium of the connecting-rods *y v w*, thus permitting the spouts to receive a transverse vibrating movement from the movement of the shoe without vibrating with it.

To enable spouts *o* and *q* to oscillate freely, these are hung in bails N O, suspended from the sides of the machine.

At the rear end and lower corner of frame A is a transverse shaft, P, mounted in suitably-arranged bearings, and provided at one end with a pulley, 4, while its other end projects into the elevator-trough Q, where it is provided with a spur-wheel, 9. Shaft P is provided with one or more sheaves or pulleys, for operating a stacker or other machinery used in connection with the thrashing-machine.

In my former patent above referred to, the tailings-elevator was composed of a concave floor or trough, with buckets mounted on an endless belt, and having a convex surface matching the concave floor or trough. Such construction is, however, objectionable, as the tailings will adhere to said floor or trough, and consequently choke or clog up the elevator, which is obviated by making the floor or trough R V-shaped in cross-section, as shown in Fig. 5, in which fit correspondingly V-shaped buckets S, mounted on an endless chain, S′, passing around spur-wheels arranged at the upper and lower ends of the elevator.

By my improved construction of floor or trough and buckets, the inclined sides of the trough or floor are sufficiently steep to prevent the tailings from adhering to them, and thus preventing or obviating the choking up or clogging of the elevator.

The several operating parts of the machine—viz., the thrashing-cylinder, cylinder-picker, separating-shaker, (which, again, operates the shoe and vibrating spouts in the manner described,) elevator-pulley, and fan—are operatedby the pulleys 1, 2, 3, 4, and 5, respectively, to which motion is, in turn, communicated by the endless band T. 6 and 7 are auxiliary pulleys, hung on stub-axles which project from the main frame A, for giving to belt T the proper twist to operate these pulleys.

In order to keep the belt always taut and prevent slipping, I employ a belt-tightener consisting of a pulley, 8, pivoted at the short end of a lever, U, having its fulcrum at *a″* in the frame of the machine, the other long end or arm of which may be adjusted and secured in any given position by means of a pin or bolt, *b″*, entering any one of a series of holes in one of the timbers of frame A.

The motive power may be applied to any of the operating-shafts of pulleys 1, 2, 3, 4, or 5, as expediency may direct.

It is obvious that parts of the machine—such as the thrashing-cylinder, cylinder-concave, fan, separating-riddles, &c.—not particularly described may be of any suitable or desired construction.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a combined thrashing-machine and

separator, the combined straw-carrier and screen composed of the rectangular frame *c*, longitudinal toothed bars *e h*, transverse bars *f*, wire screen *g*, and transverse rods *i*, arranged in front of said screen *g*, substantially as and for the purpose herein shown and described.

2. The combination, with the straw-carrier and screen E, suspended at its rear end by its operating crank-shaft *l*, and the shoe H, suspended at its rear end by the links *t*, of the walking-beams *m*, pivoted to the sides of the machine, and connecting and suspending the straw-carrier and screen, and the shoe near their front ends, whereby the straw-carrier or screen is adapted to receive an upward, backward, downward, and forward motion, and the shoe a free swinging motion in an opposite direction, by the motion imparted to said carrier and screen, substantially as herein shown and described.

3. In a combined thrashing-machine and separator, the combination, with the straw-carrier and screen E, the shoe H, and the suspended spouts *o q*, of intermediate connecting mechanism whereby said straw-carrier and screen, the shoe, and spouts are simultaneously vibrated in different directions through the medium of the mechanism for operating the straw-carrier and screen, substantially as herein shown and described.

4. The combination, with a vibrating shoe, of transverse spouts *o q*, loosely suspended from the frame of the machine, and connecting mechanism between said shoe and spouts, whereby the spouts are vibrated transversely by the motion of the shoe without moving with it, substantially as specified.

5. The combination, with the vibrating straw-carrier and screen E, the thrashing-cylinder and concave C *c'*, and vibrating shoe provided with the grain-board I, of the inclined grate or riddle F, extending over the forward end of carrier or screen, and under the concave, substantially as and for the purpose herein shown and described.

6. The combination, with the vibrating shoe H, having the spout *q*, riddle or riddles *n*, and transversely-grooved grain-floor I, of the longitudinal rods or wires *s*, connected to the rear end of said grain-floor, and projecting or extending backward up over the riddle or riddles *n*, substantially as and for the purpose herein shown and described.

7. In a combined thrashing-machine and separator, the tailings-elevator having a V-shaped floor or trough, R, in cross-section, and correspondingly V-shaped buckets S, mounted on an endless chain, S', whereby the inclination of the sides of the floor or trough prevents the tailings from adhering thereto, and thus obviating choking or clogging of the elevator, substantially as herein shown and described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ROBERT H. MONTEITH.

Witnesses:
J. F. ELLIS,
JERE MURPHY.