L. C. ROYER.

Improvement in Grain-Separators.

No. 114,974 Patented May 16, 1871.

Fig. 1.

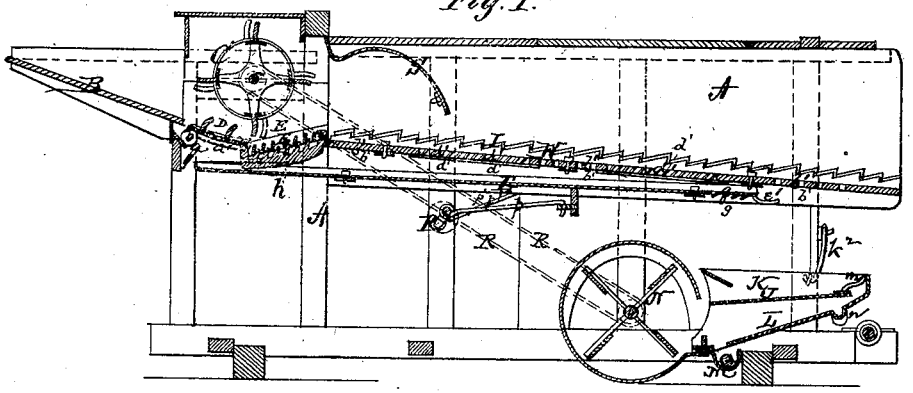


Fig. 2.

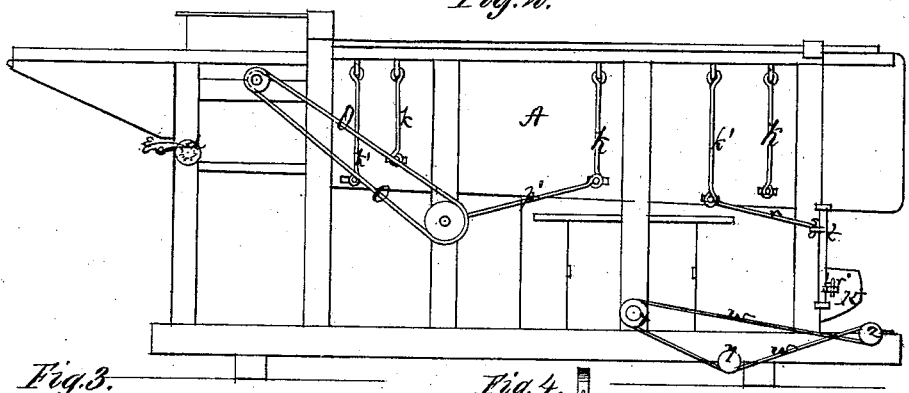


Fig. 3.

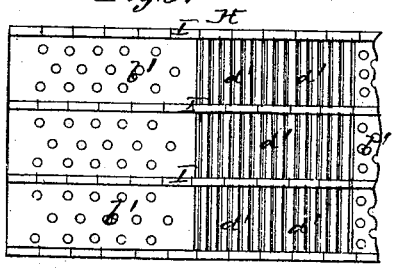


Fig. 4.

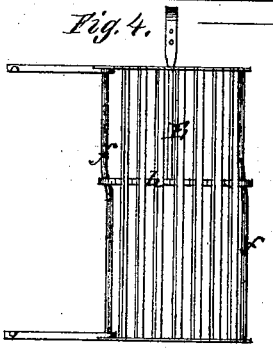
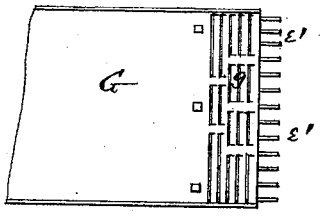


Fig. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

LEWIS C. ROYER, OF ROYERTON, INDIANA.

## IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **114,974**, dated May 16, 1871.

*To all whom it may concern:*

Be it known that I, LEWIS C. ROYER, of Royerton, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in the construction and arrangement of a thrashing-machine, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a longitudinal vertical section, and Fig. 2 a side view, of my machine. Fig. 3 is a plan view of the shaker. Fig. 4 is a plan view of a grate at the inner end of the spiked concave. Fig. 5 is a plan view of the front end of the grain-receiver.

A represents the frame of my machine, at the front end of which is the feed-table B. The grain is fed in over this table, and passes in between the spiked or toothed cylinder C and spiked concave D. This concave is placed in hangers $a'$, which are hinged at their rear edges, and the front edge of the concave is supported upon two double eccentric rollers or collars, $a$ $a$, attached to a shaft, $b$. Upon one end of said shaft is a toothed wheel, $d$, by means of which the shaft $b$ is turned so as to raise or lower the concave, thereby bringing it closer to or farther from the cylinder C, as may be necessary.

The shaft, with eccentrics, is held in the desired position by a pawl, $e$, engaging with the toothed wheel $d$. The outer or front ends of the hangers $a'$, in which the concave is placed, are, or should be, turned over the eccentrics $a$ $a$ as a kind of spring-holder, to prevent the concave from springing up against the cylinder.

After passing between the concave and cylinder the straw is thrown against the concave straw-director S, which directs the straw to the shaker or straw-carrier H. This shaker extends clear to the rear end of the machine, and is suspended by hangers $k^1$ $k^1$ on the outside of the frame. It is constructed as follows: Four toothed bars, I I, run lengthwise through the machine, said bars being connected on the under side by boards $b'$ $b'$, which are perforated by any suitable number of holes, the lower edge of each hole being countersunk, as shown. The perforated boards $b'$ are placed a suitable distance apart, and between them, in the under edges of the toothed bars I, are let in metal slats $d'$, in an inclined position, which slats thus form grates between the boards, and with the boards form the bottom of the shaker or straw-carrier.

The two toothed bars I at the sides are a little higher than those between, and the teeth of all of said bars are of unequal height—say about every third one higher than the rest—and the teeth on the outside bars are cut down on the inside to near the bottom of the shaker.

The intermediate grates may be dispensed with and the bottom of the shaker formed of perforated boards entirely, if so desired.

The grain, after passing between the cylinder and concave, falls onto a grate, E, the bars of which are flat and pivoted at their ends.

On each side of the grate is a bent bar, $f$, and a toothed slide, $h$, passing transversely under the grate, is made to move on said bars with its teeth projecting upward between the grate-bars. By the movement of the slide $h$ the grate-bars are turned on their pivots, so as to make the space between them larger or smaller, as may be desired. The grain falls through this grate onto the grain-receiver G, which extends a suitable distance toward the other end of the machine, and is at this end provided with a grate, $g$, as represented in the drawing, and the rake-teeth $e'$ are attached to the extreme edge of the grate. This grain-receiver is suspended by hangers $k$ $k$ on the outside of the frame, and receives its vibrating motion by means that will be presently described. It is constructed entirely of sheet metal, with the edges turned slightly upward, and the grate $g$ is cut out of the same metal, with the rake-teeth $e'$ $e'$ riveted or otherwise fastened to the same. From the grain-receiver

G the grain falls onto the sieve J in the shoe K. Under this sieve, in the shoe, is the board L, which inclines in the opposite direction from the sieve.

At the inner end, under the shoe, and attached to the same, is a bar with a hole in the center, which is placed on a pin within the frame, thus pivoting the shoe at its front end. The outer end of the shoe is suspended on hangers $k^2$ $k^2$.

At the outer end of the sieve J is a rake or grate, *m*, through which the large grain which has not passed through the sieve falls down into the spout *n*, and is carried out at the side of the machine into an elevator, and is from there carried up into a trough or spout to be again conveyed to the cylinder and passed through the machine.

The clean grain passes through the sieve J onto the board L, and from thence into the conveyer-box M, where it is carried by the conveyer to either side of the machine. All chaff, dust, &c., are blown out by means of the fan N, situated under the grain-receiver at or near the inner end of the shoe K.

The various parts of my machine are operated in the following manner: A belt, O, connects a pulley on the shaft of the toothed cylinder C with a pulley on the end of a shaft, P, having its bearings in the frame A at a suitable point under the grain-receiver. This shaft is provided with three cranks—one in the center and one near each end, the one in the center, however, extending in diametrically opposite direction to the end cranks. The center crank is, by a pitman, *p*, connected with a bar on the under side of the grain-receiver, and the end cranks are, by similar pitmen *p'* *p'*, connected with the ends of a cross-bar on the under side of the straw-carrier.

It might here be remarked that both the straw-carrier and grain-receiver are attached to transverse bars, the ends of which are rounded and pass through horizontal slots in the sides of the frame and supported in their respective hangers.

By the arrangement of the crank-shaft P and pitmen *p p'*, it will be seen that the straw-carrier and grain-receiver receive a reciprocating motion, and always in opposite directions. When one moves forward the other moves backward, and vice versa.

From the end of one of the transverse bars under the grain-receiver a rod, *r*, connects with an arm, *s*, on the upright shaft *t*, and another arm, *s'*, is, by a rod, *r'*, connected with the shoe K, which shoe thus obtains a reciprocating side motion. A belt, R, connects pulleys on the cylinder-shaft and fan-shaft. Upon the other end of the fan-shaft is a pulley, *x*, over which passes a cord or round belt, *w*, said cord or belt passing under a pulley, *y*, on the end of the conveyer-shaft, and is twisted around a pulley, *z*, upon a shaft at the extreme end of the machine, thus contributing the necessary motion to the conveyer. By changing this cord or belt *w* the conveyer may be made to turn in either direction, so as to carry the grain to either side of the machine.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the cylinder and concave, the grate E, composed of flat pivoted bars, operated by means of the slide *h* and bars *f f*, substantially as and for the purpose set forth.

2. The combination of cylinder C, concave D, grate E, constructed as described, and straw-director S, all arranged to operate substantially as described.

3. The shaker H, composed of perforated boards *b b'*, inclined slats *d d'*, arranged alternately as shown, and toothed bars I I, substantially as and for the purpose set forth.

4. In combination with the grate E and shaker H, the grain-receiver G, formed of sheet metal with its edges turned up, and at the rear end provided with grate E and rake-teeth *e e'*, substantially as and for the purpose set forth.

5. The within-described grain-separator, all the parts constructed and arranged as described.

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

LEWIS C. ROYER.

Witnesses:
T. H. ALEXANDER,
J. V. WHITE.