W. H. RICKARD.

GRAIN SEPARATOR.

No. 180,068. Patented July 18, 1876.

Fig. 1

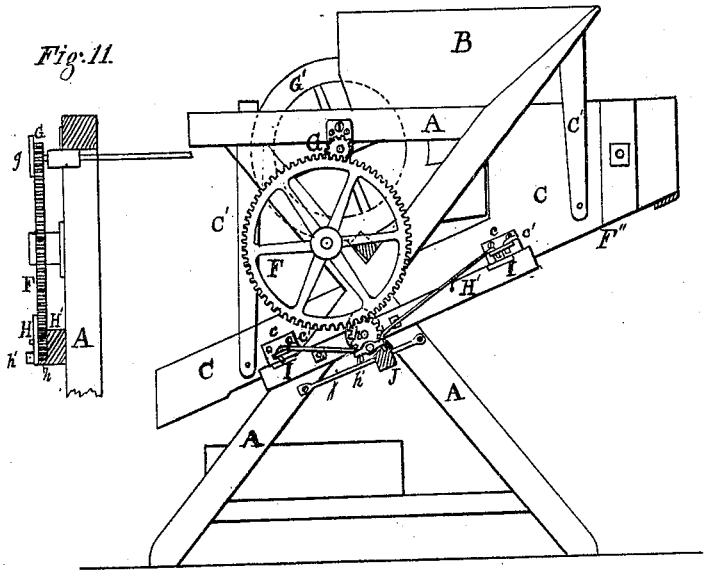


Fig. 11.

Fig. 12.

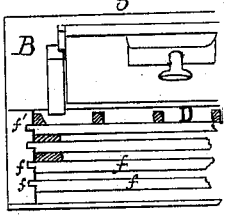


Fig. 2.

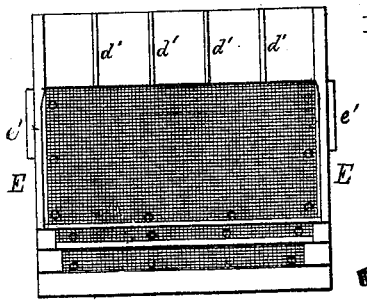


Fig. 3.

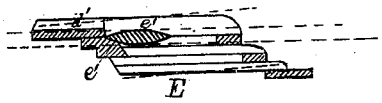


Fig. 4.

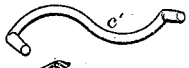


Fig. 5.

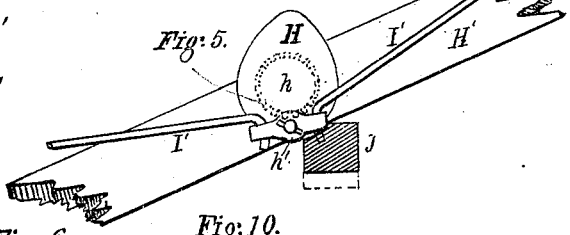


Fig. 6.

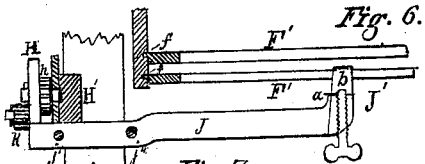


Fig. 7.

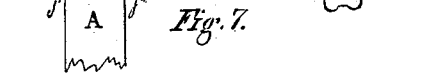


Fig. 10.

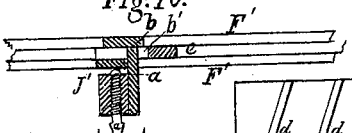


Fig. 9.

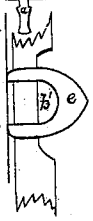
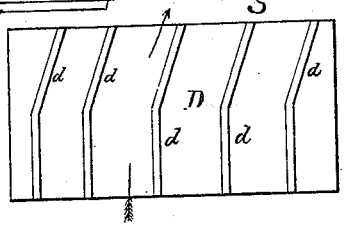


Fig. 8.



WITNESSES:

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Alfred Boughly

INVENTOR.

William H. Rickard

per Blanchard and Singleton

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM H. RICKARD, OF REDLAND, MARYLAND.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **180,068**, dated July 18, 1876; application filed May 31, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. RICKARD, of Redland, in the county of Montgomery and State of Maryland, 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, 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, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of the separator. Fig. 2 is a plan view of a grain-board attached to the riddle. Fig. 3 is an end view of Fig. 2, showing the construction of the screens. Fig. 4 represents the link-rods for connecting the shoe and the bell-crank levers. Fig. 5 is an enlarged view of the eccentric wheel, with the pinion and link to give motion to the rods leading to the bell-cranks. Fig. 6 is a section of a pair of the long screens. Fig. 7 is a view of the jarring-lever. Fig. 8 is a top view of the grain-board. Fig. 9 is a sectional plan of the two screens seen in Fig. 6, showing the method of arranging them for the jarring-lever to strike both screens. Fig. 10 is a section of long screens, showing the jarring-lever. Fig. 11 is a view of the gearing. Fig. 12 is an end view of the screens.

This invention relates to several improvements in combined fanning-mills and grain and seed separators; and consists in the arrangement and construction of certain devices, whereby the action of the shoe, when being shaken, is positive and regular; in the improved striking-lever, whereby the first two screens may be jarred by the same blow; also, the construction of the separating-board, and several other details, all of which will be hereinafter more fully described and claimed.

In the drawing, A is the frame, made strong and of suitable size. B is the hopper. C is the shoe provided at its upper end with a grain-board, D, having stationary spreaders *d d d*, &c., arranged at an obtuse angle, as in Fig. 8, and a nest of short sieves, E, arranged as shown in Figs. 2 and 3, having, also, several long screens, F′ F′, and the bottom covered for half the length with a screen-cloth at F″. Each of these screens discharges the grain by separate channels, as in ordinary machines. C′ C′ are metallic straps, which are fastened at top to the frame, and at bottom to the shoe C, which is held up by them, and from their flexibility the shoe is permitted to vibrate freely. F is a spur driving-wheel, pivoted on one of the legs of the frame, and the boxing by which it is held may be adjusted on the leg, so that it may be regulated to take up the backlash in the gearing of the two pinions G and *h*. G is a pinion, supported in a bracket attached to the top rail of the frame A, and meshes into the gear-teeth of wheel F. This pinion is on the outer end of the shaft, on which is the fan G′, and gives motion to it. Pinion G has a flange, *g*, on it. (Not represented in Fig. 1, but in section, Fig. 11.) H is an eccentric, having inside of and attached to it a pinion, *h*, (seen in dotted lines in Fig. 5,) which gears with separate spur-wheel F. This eccentric is sustained in a sloping bearer, H′, which is bolted to the two legs of frame A, and on the ends of which are the bell-crank levers I I, having holes in them for the connecting-rods I′ I′, which are coupled with a link, *h′*, pivoted on eccentric H. The link *h′* is placed on the crank-pin of the eccentric H, and to it at each end are attached the rods I′ I′, and it is thus interposed for the purpose of accommodating the play of the rods in the rotary motion of the eccentric, and is an improvement upon the usual method of attaching the rods directly to the crank-pin. On the sides of the shoe C are brackets *c c*, having holes for the hooked ends of connecting-rods *c′ c′*, which are of the **S** form, as seen in Fig. 4. Under the bearer H′ is a lever, J, which is pivoted on a rod, *j*, extending from one leg of the frame to the other, as seen in Fig. 1, on the outside. Lever J has two holes in it, and the rod *j* may be unscrewed from the outside, and secured on the inside of the legs, and then the lever has a longer fulcrum, as will be seen in Fig. 7 at *j′ j″*. The purpose of this is to regulate the striking of the lever, according to the different work being performed in the separator. This striking-lever is made at its inner end like the poll of a hammer, but has two bearing-surfaces, as seen in Figs. 7 and 10 at J′. In one of these is in-

serted a wood-screw, with the rounded end at *a*, which is made to touch the under side of the cross-rail of the lowest long screen F′ in the shoe, when the long end of the lever J touches the rail in the second long screen, as seen in Fig. 9, at *b*. In order that the end *b* of the lever may reach the cross-rail of the second screen a hole, *b′*, is made in the first screen, and a horseshoe-shaped guard, *e*, is placed around the hole, as in Fig. 9, to prevent the grain from running through.

By this construction the striking-lever operates upon both screens at the same time. The eccentric H, as it revolves, presses down the outer end of lever J, and throws up the hammer end J′. The set-screw *a* can be regulated to suit the distance apart of the two rails of the screens.

In Fig. 6 is seen the two long screens, partly in transverse section, showing the sliding grooves *f f* in the side of the shoe.

In Fig. 2 is a top view of a grain-board and nest of short screens, E, consisting of three screens. The division-straps *d′ d′* distribute the grain. On the side are strips *e′ e′*, which slide into the grooves *f′ f′* and are made tapering both ways, so that the screens can be tilted up or down when required to let off the grain faster or slower, and are thus held firmly in any desired position by the longer bearing given by the form of the cleat, whereas in the ordinary pivot-bearing, by the constant motion of the shoe, the screens do not maintain the angle given at the commencement of the screening.

At Fig. 4 is represented the reversed curved connecting-rods, which connect the bell-crank levers with the sides of the shoe. They are made of this shape to prevent them from riding against the cranks I. The grain-board D, Fig. 8, has the strips *d* in a bent form to check the grain, when flowing too fast, to throw the grain to the opposite side from the shaking apparatus, and thus equalize the spread of the grain, which is an important feature of this invention.

By removing the nut on G that pinion can be removed and the fan be idle, &c.

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

1. The combination of the rods I′ I′, bell-cranks I I, link *h′*, and crank-disk H, all substantially as and for the purpose described.

2. The screens E, supported in the grooves of the shoe by the double beveled cleats *e′ e′*, substantially as and for the purpose described.

3. The jarring-lever J, with the striking end, having two bearing-surfaces, constructed substantially as and for the purpose described.

4. The jarring-lever, having an adjustable screw, *a*, in one of its striking-surfaces, for the purpose as described.

5. Guard-block *e*, attached to the screen around the opening, constructed substantially as and for the purpose described.

6. The grain-board D, divided by the stationary separating-strips, each being bent at an angle, substantially as and for the purpose described.

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

WILLIAM H. RICKARD.

Witnesses:
LOUIS D. WINE,
GEO. N. PERRY.