

S. K. AYRES.

Improvement in Grain-Separators.

No. 114,251.

Patented May 2, 1871.

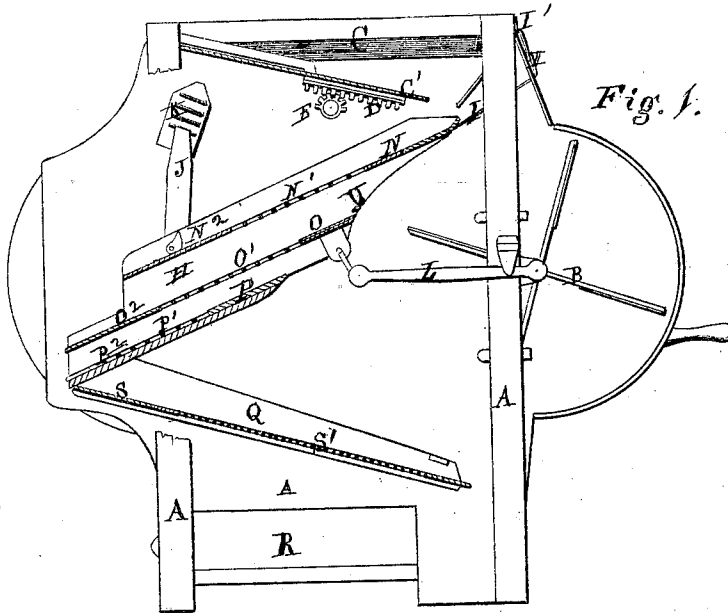


Fig. 4

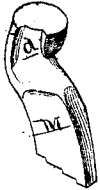
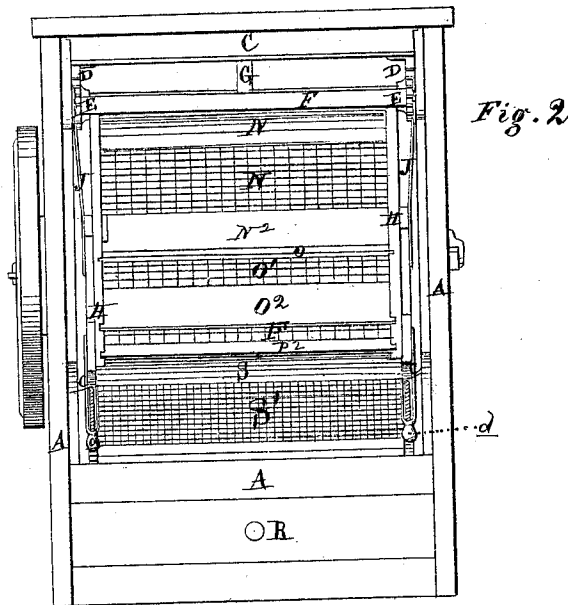
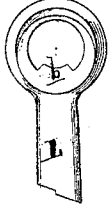


Fig. 5.



Attest.

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SIDNEY K. AYRES, OF DELLTON, WISCONSIN, ASSIGNOR TO HIMSELF AND PETER FLICKNER, OF SAME PLACE.

Letters Patent No. 114,251, dated May 2, 1871.

IMPROVEMENT IN GRAIN-SEPARATORS.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, SIDNEY K. AYRES, of Dellton, in the county of Sauk and State of Wisconsin, have invented a new and useful Improvement in a Grain-Separator; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a side elevation of my device, with the casing removed to show the interior construction thereof.

Figure 2 is an elevation of the same from the rear or discharge end.

Figure 3 is a detached view in perspective, showing the method of securing the screen-slides in their grooves in the shoe.

Figures 4 and 5 respectively show the construction of the joining ends of the shaker-rod, bell-crank, and the pitman.

Like letters indicate like parts in each figure.

The nature of this invention relates to an improved construction of grain-separators; and

It consists in the novel and peculiar arrangement in the vibrating shoe of a gang or series of sieves for chaffing, each with a sieve-board in its groove, so that the grain in falling alights on a board which changes its direction before proceeding to the sieve, where the wind acts upon it to remove the chaff, through which it falls to a second sieve-board, and in like manner proceeds to a third, from which it is discharged to a grading-screen; in the construction and arrangement of the parts connected with the feed portion of the separator; in a novel and convenient joint between the ends of the pitman and shaker-crank; in the arrangement of the parts connected with the suspension of the shoe; in the arrangement and construction of the parts connected with and forming the shoe; and in the general arrangement of its various parts, as more fully hereinafter set forth.

In the drawing—

A represents the frame and casing of my device, and B the wind-wheel or fan.

C is the hopper, whose slide O' is provided with a pair of racks, D, on its under side, with which mesh the toothed sectors E on the shaft F, transversely journaled in the casing.

On the under side of the slide is secured a longitudinal strip of wood, G, whose thickness is such that its lower edge will bear upon the shaft F, so that when the slide is adjusted to any opening the slide will not be liable to close and vary the feed from the vibration of the mill.

H is the shoe, adjustably suspended at the inner end by a strap, I, hooking into a notched plate, I', on

the hopper-frame, and at the end by the spring bars J, rigidly secured at their lower ends to the sides of the shoe, and having hooks at their upper ends which engage with the sockets cut in the plates K secured to the casing of the machine.

The vibration of the shoe is effected in the usual manner, from a crank on the end of the fan-shaft acting, through the pitman L, upon a bell-crank, M, pivoted in a slot in the casing. From the other arm of the bell-crank a shake-rod transmits the vibratory movement to the shoe.

As the ordinary joint between the bell-crank and the pitman soon wears out from the peculiar torsive action of the former upon the latter, I have endeavored to overcome the difficulty by the employment of the joint shown in figs. 4 and 5. By reference to the drawing it will be seen that the joint end of the bell-crank is bent to present a convex surface on the side toward the discharge end of the mill, with a corresponding concavity on the opposite one, while a longitudinal groove, a, is carried underneath from the extremity to the concavity.

The end of the pitman is in the form of a circular eye, convex toward the center, the circle of the opening being broken by a projecting stud, b, knife-edged, and being a prolongation of the pitman-bar.

To effect the coupling the pitman is held in a vertical position, eye upward, when the latter is slipped over the end of the bell-crank, the stud b following the groove a in the bell-crank until the concavity referred to is reached, when the pitman may be turned upward to a horizontal position and its other end connected to the fan-shaft crank-pin. The knife-edge of the stud forms a fulcrum for the bell-crank to oscillate upon, while the other side, being convex, forms a sort of a ball-and-socket joint in the eye, so that the wear of the parts will be reduced to a minimum.

The joint is self-supporting, easy to put together, and costs but little, as it is complete when the castings are taken from the sand.

The principal feature of my invention is the arrangement of the separating-sieves and screen in the shoe. It is generally conceded by practical men that the first screen does fully two-thirds of the work in the separation of the grain from its impurities. With this fact in view I place in the upper grooves of the shoe a frame composed of the sieve-board N, at the upper end, a short coarse-meshed sieve, N¹, next below, and lastly, a tail-board, N², at the lower end.

In the next groove below I place a similar frame, composed of a sieve-board, O, sieve O¹, and tail-board O², and in the lower groove similar ones, P, P¹, and P², the sieves in each being about four to four and a half meshes to the inch, and arranged so that the grain falling from the hopper, alighting on the sieve-

board N, has its direction changed before reaching the sieve, over and through which it passes with rapidity, as all the sieves are inclined at a steep pitch. Here the blast first strikes and the heads, cockle, and other impurities generally will not come through but pass off over the tail-board. The grain will have passed but a little way, however, on the first sieve before it falls through to the sieve-board of the second set below. Here its direction is again changed, with a like result, and in like manner passes to the third set.

In changing the direction of the grain I wish to be understood that the relative positions of the berries or grains themselves are changed, as it is well known that in falling the grains assume a vertical position; hence, if the sieves were below, they would fall through; therefore I cause them to drop first on the sieve-board, whence they roll along to the sieve, so that the wind deflected by the sieve-boards will strike the falling matter on the sieves in a direction to throw it up and off the sieves, causing the light and longer grain, such as oats and wheat not chaffed, to pass off the short sieves quickly, with all other impurities, to the tail-board, which discharges them without giving them another chance to mingle with the separated grain.

At the lower extremities of the shoe is pivoted the upper end of a screen-frame, Q, inclined in the opposite direction. It is also suspended from the sides of the shoe by a strap, c, passing under the edges of the sides of the frame in the form of a stirrup, through the bottom of which a screw, d, is tapped, bearing against the lower edges of the frame. By turning these screws up or down the inclination of the screen-frame may be varied.

Under the frame is a drawer, K.

The grain from the gang of coarse sieves is received at the upper end of the frame on a grain-board, S, whence it passes to a screen, S', of about fourteen meshes to the inch, over which it passes, the lighter, smaller, and shrunken berries passing down into the drawer, and the plump, marketable article discharged at the lower end.

The adjustability of this screen is an important item to the farmer. For instance, he wishes to clean his seed wheat; by giving the screen less pitch the grain travels slowly over it, and everything that can be taken out by a screen is removed. Again, the screenings make good feed, which would otherwise be a loss to him, for all such is invariably taken out by the smut-mill when he takes his wheat to mill for grinding.

My method of securing the sieves in their grooves is so clearly shown by the latch-dog T, in fig. 3, as to need no explanation.

From the peculiar position of the second sieve with relation to the upper and the fan, to prevent a reaction of the wind on the surface of the second sieve-board, I place a deflector, U, across the shoe at the upper end of and slightly above the said board, so that a thin blast will be directed thereon and compel the forward movement of the grain falling on the board.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the shoe H, the spring strap J, the plates K, the strap I, and the hook I', when the several parts are constructed, arranged, and operated substantially as described and shown, for the purposes set forth.

2. The combination of the screen-frame Q with the shoe H, when the same is adjustably suspended to said shoe by means of the stirrup c and screw d, as and for the purpose set forth.

3. The arrangement in the shoe H of the sieves N¹, O¹, and P¹, and screens S', grain-boards N, O, P, and S, tail-boards N² O² P², and the deflector U, substantially as and for the purposes specified.

4. The bell-crank M provided with the groove a, in combination with the pitman L provided with the stud b, all constructed, arranged, and operated substantially as described and shown, for the purposes set forth.

SIDNEY K. AYRES.

Witnesses:

HENRY M. HIGBEE,
FREDERICK C. LEWIS.