2 Sheets—Sheet 1.

N. KIBLER.

Grain-Separators.

No. 210,333. Patented Nov. 26, 1878.

Fig 1.

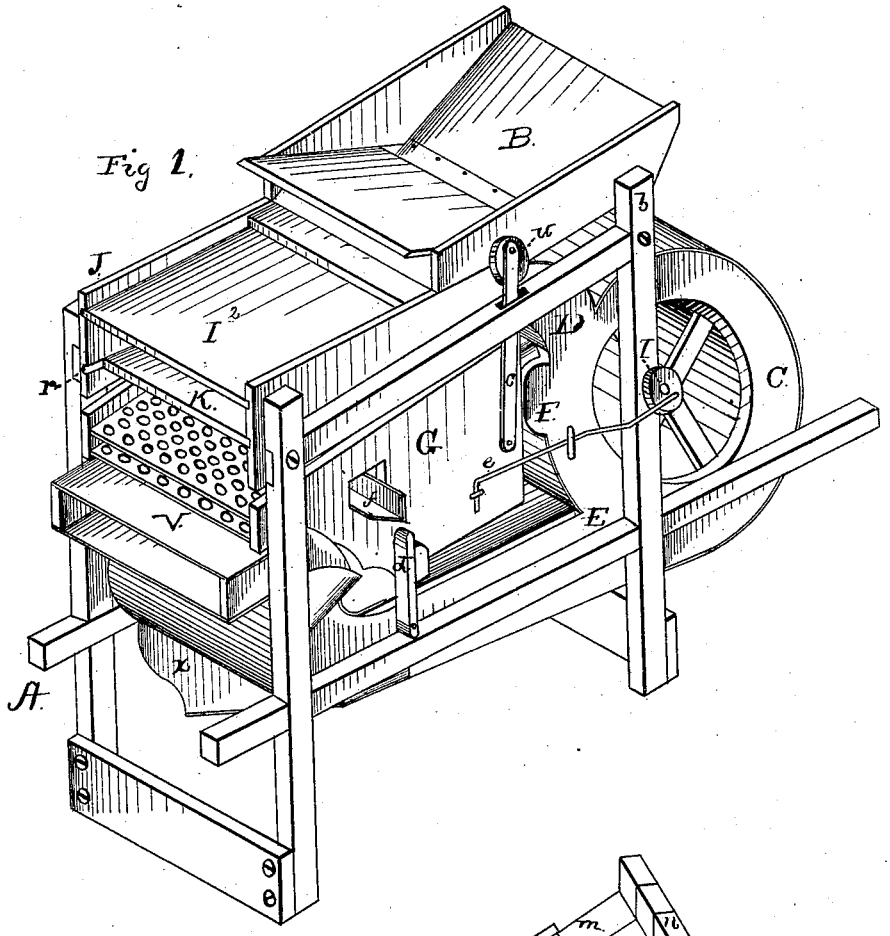


Fig 3.

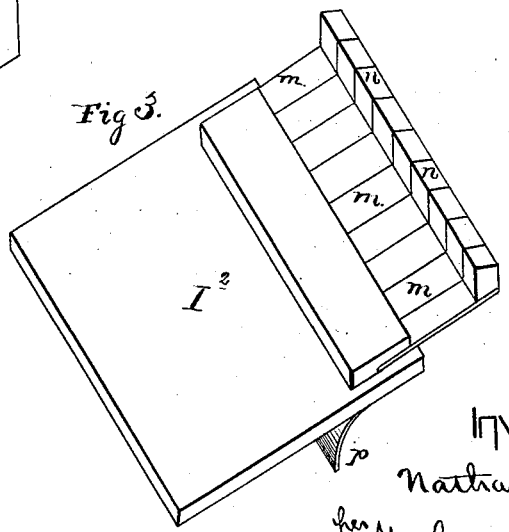
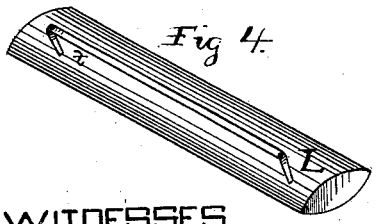


Fig 4.



WITNESSES

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INVENTOR

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2 Sheets—Sheet 2.

N. KIBLER.

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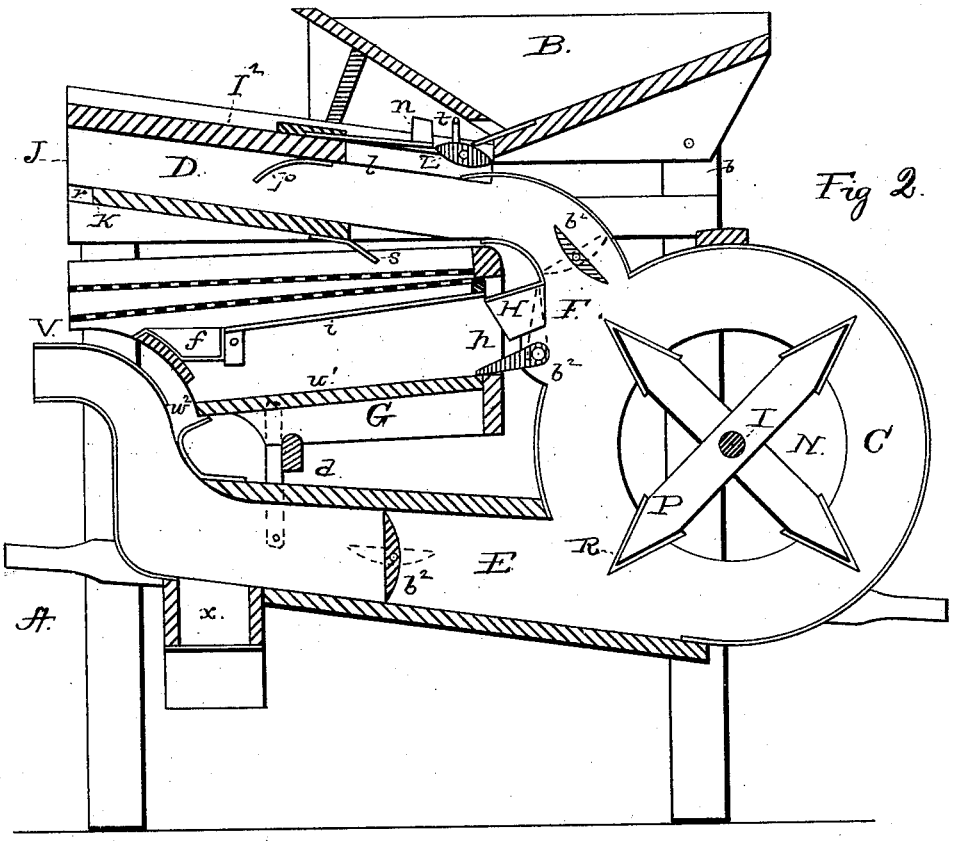

Fig 2.

Fig 3.

WITNESSES

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UNITED STATES PATENT OFFICE

NATHAN KIBLER, OF PITTSFIELD, ILLINOIS.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **210,333,** dated November 26, 1878; application filed September 25, 1878.

To all whom it may concern:

Be it known that I, NATHAN KIBLER, of Pittsfield, in the county of Pike and State of Illinois, have invented a new and valuable Improvement in Grain-Separators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a perspective view of my improved machine. Fig. 2 is a central sectional view, showing the interior of the machine. Fig. 3 is a perspective view of the feed-board with flexible slats. Fig. 4 is a perspective view of the feeding device. Fig. 5 is a plan view of the device for separating oats.

My invention relates to improvements in machines for cleaning grain, &c.; and it consists, first, in a feeding device located at the throat of the hopper, in combination with a board having flexible fingers or slats; second, in mechanism for giving a quick vibratory motion to the feeder, and at the same time giving a longitudinal motion to the shoe; third, in the combination of a slide-board in the hopper and a slatted apron, with projections at its forward end; fourth, in a fan-wheel having wings or V-shaped blades, so that the wheel can be operated in either direction; fifth, in the combination of three air channels or passages with an over and under blast; and, finally, in the combination and arrangement of parts, as will be hereinafter more fully set forth.

In the accompanying drawings, forming a part of this specification, the corresponding parts are designated by the same letters.

In the drawings, the letter A represents the frame-work supporting the various parts of the machine. To the upper end of the vertical posts *b* is pivoted the forward end of the hopper B. Between the side bars of the frame is secured by suitable means a fan-casing, C, having three air passages or channels, substantially as shown in Figs. 1 and 2 of the drawings. The letter D indicates the upper passage for currents of air, E the lower passage, and F the intermediate passage, all extending from the fan-case, and provided with valves b^2, for regulating the currents of air.

G represents the shoe, in which the sieves are arranged for sorting the grain into qualities, suspended by the pivoted rods *c*, and supported upon the rocking bar *d*. This shoe, with sieves, receives a longitudinal shaking motion by means of a connecting-rod, *e*, attached to the main shaft I, and is also provided with a spout, *f*, for receiving and discharging the grain that has been subjected to a blast and passed through the sieves. It will be noticed that this shoe has an opening, *h*, at its inner end, below the sieves, which passes over a short extension, H, of the intermediate air-passage, E, as shown in Fig. 2. The upper screen or sieve of the shoe carries off the "white caps," sticks, and other extraneous matter; and the lower screen or sieve is for grading or removing the cockle from the grain, and is provided with a fall-board, *i*, attached to the under side of the sieve-frame, and is designed for discharging the small wheat into the spout *f*, located in the shoe, and from thence to a receptacle to receive it. The upper air-passage, D, is provided with a slide, I^2, serving the double purpose of a feed-board and top, and operates in the grooves *l* of the side-boards J, attached to the frame-work. The inner or forward end of this slide I^2 is provided with a series of slats, *m*, suitably connected, and having at their outer ends the upward projections or blocks *n*, as shown in Fig. 3 of the drawings. The object of the flexible slats is to permit sticks, pieces of corn-cobs, and other foreign material to pass under without doing any damage, and the blocks thereof are for keeping the grain from running over upon the board. The under side of this slide I^2 is provided with a curved shield, *p*, acting as a deflector. This air-passage D is also provided with a movable sliding board, K, working in the inclined grooves *r*, forming a bottom to the passage. The forward end of this slide has a downwardly-projecting shield, *s*, acting as a conductor for guiding the grain to the sieves in the shoe.

The upper shield, *p*, deflects the grain and heavy matter that are forced outward from the incoming grain by the blast upon the incline sliding board and sieves.

To the upper end of the frame, immediately below the hopper, is suitably journaled a device consisting of a bar, L, and a raised wire, *t*, operated by suitable mechanism. This device, arranged below the throat of the hopper, substantially as shown, I denominate a "feeder," as it performs a double office, to wit, feeds the grain from the hopper to the screens below and agitates the falling grain. The bar L is elliptical, or nearly so, in cross-section, so that in its vibratory motion the longest diameter will be horizontal, which will make an opening of about three-eighths of an inch in its downward movement, and in its upward movement closing the feed-passage, thereby producing an intermittent feed.

The wire *t* is attached to the upper surface of the elliptical bar L and parallel therewith. This wire, with the bar L, has a quick vibratory motion through the falling grain, and keeps the same continuously in motion to prevent the accumulation of trash, &c., above the bar. This feeder is operated by means of one of the separator-supports *c* and crank-wheel *u*. The feed to the sieves is increased or decreased by adjusting the slide-board I^2 outwardly or inwardly.

The letter N indicates a fan-wheel, having the outer ends of the arms P made V-shaped to receive the double-faced wings or blades R, substantially as shown.

The double wings or blades thus made and applied to the arms of the wheel will force the wind in both directions, to wit, above and below, and also give greater wind-power, in view of the fact that as the air rushes into the fan-case to fill the vacuum formed behind the wings the air will strike the slanted or inclined blades and glance off with great force to the circumference of the casing, where it is wanted, to be discharged through the air-passages.

When it is required to clean oats the device shown in Fig. 5 is used, and in this case the shoe-frame S is supported with strap-iron arms, so fastened that it cannot move lengthwise.

Within the shoe-frame the bars *w* are arranged in an angular position by means of bolts or screws, so that when one bar is pushing the other is pulling the separator T from side to side, thereby producing a soft gentle motion in a lateral direction.

The upper and lower air-channels are used in cleaning grain or seed that has been cleaned with a separator. The upper and middle air-channels, the latter forming a communication with the rear end of the shoe under the lower sieve, with the over-blast, are used for removing chaff and other light matter from the grain.

The air cut-off or valve b^2 in the middle air-channel is arranged so that it forms the under side of the said air-channel when open, and is so arranged that by turning the valve the air will be thrown upward against the sieves with great force.

The grain or seed is fed from the hopper by means of the vibratory feeder upon the sieves, where it is subjected to a blast of air to remove extraneous matter, the small grain passing downward through the sieves and conducted into the spout in the shoe. The larger grain, &c., passes over the tail ends of the sieves, falling upon the curvilinear top V, which is a continuation of the lower air-channel, thence through an opening, w^2, which also receives the grain, &c., from the incline board w' of the shoe, into the channel, where it is subjected to currents of air, thoroughly cleansing the grain before reaching the delivery-spout *x*, ready for market.

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

1. The combination of a hopper, a feeding device, and a movable board having flexible slats, all operated in the manner as described.

2. In a fanning-mill, the side rods or bars *c*, for suspending the shoe and operating the agitating or feeding device, substantially as and for the purpose set forth.

3. The combination and arrangement, with a fan and a set of separating-sieves, of three air channels or passages, provided with suitable valves for regulating the currents of air, the upper air-passage being arranged immediately under the hopper, forming a communication with the incoming grain from the said hopper, the intermediate air-passage forming a communication with the sieves in the shoe, and the lower air-passage arranged under the sieves, substantially as shown, and for the purpose set forth.

4. The movable boards I^2 and K, forming the top and bottom of the upper air-channel, and provided with the shields *p s*, respectively, for the purpose set forth.

5. In combination with the feeding device, the adjustable board I^2, having at its inner end a series of flexible slats, *m*, and projections *n*, substantially as and for the purpose set forth.

6. A fan-wheel for a fanning-mill having double blades, meeting at an angle, to render it reversible, substantially as shown and described.

7. The combination, with the shoe-frame S of a fanning-mill, of the separator-sieve T and side bars *w*, so connected that the sieve can have a gentle lateral motion.

In testimony whereof I have hereunto subscribed my name.

NATHAN KIBLER.

Witnesses:
W. H. JOHNSTON,
H. M. CHITWOOD.