2 Sheets—Sheet 1.

J. J. WEST.

GRAIN SEPARATOR.

No. 184,564. Patented Nov. 21, 1876.

Fig. 1

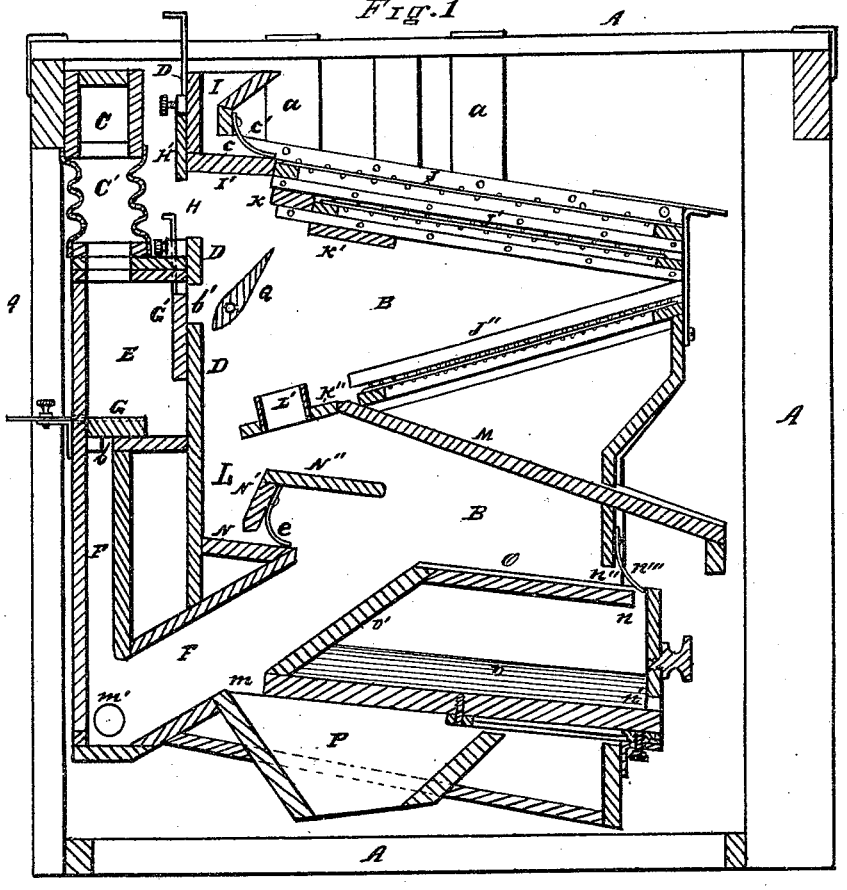
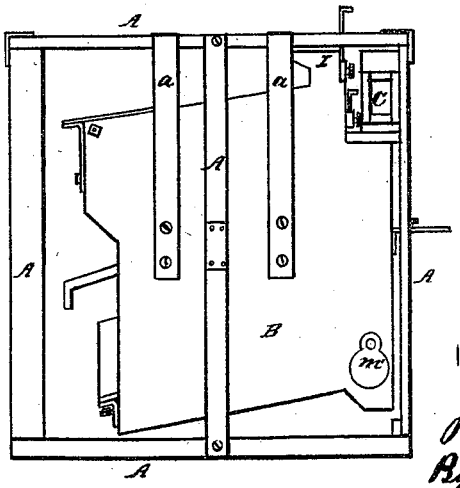


Fig. 2



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 3

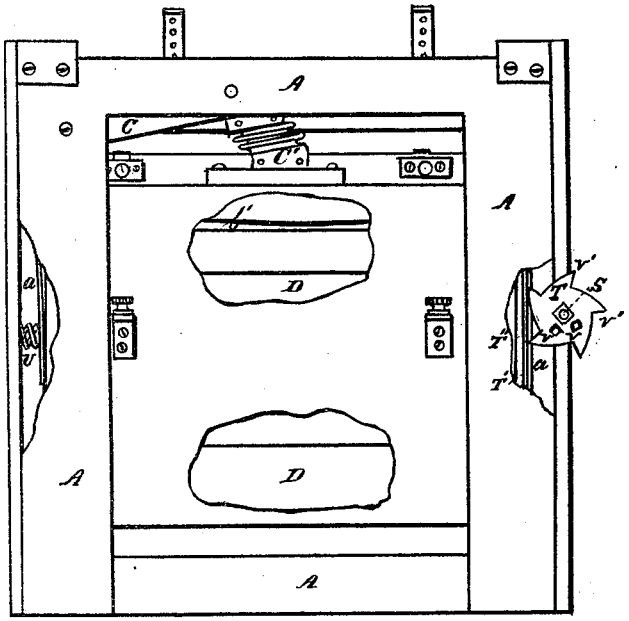
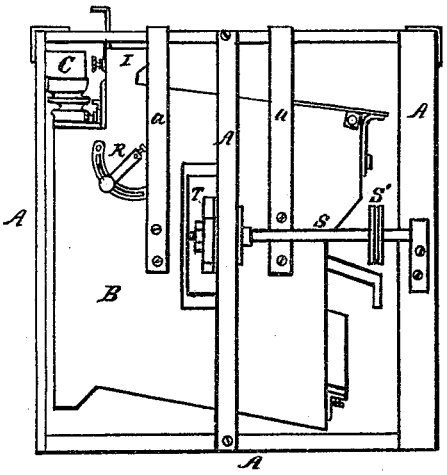


Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN J. WEST, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **184,564**, dated November 21, 1876; application filed November 11, 1875.

To all whom it may concern:

Be it known that I, JOHN J. WEST, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grain Separators and Graders, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the said improvements, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1, Sheet 1, is a vertical central section, from front to rear, of a grain separator and grader provided with my improvements; Fig. 2, Sheet 1, a side elevation of one side thereof; Fig. 3, Sheet 2, a rear elevation of the same, and Fig. 4, Sheet 2, a side elevation of the side opposite that shown in Fig. 2.

Like letters of reference indicate like parts.

In the drawings, A represents the frame, and B the body or shoe. *a a* are suspension-bars. C is a fixed tube or flue to receive the air from a blower. This flue is preferably tapering, and largest at the outer end. D is the rear wall of the separator proper, and E is an air-chamber arranged behind this wall. C′ is a flexible air-tube attached to the inner end of the tube C and to the chamber E, and communicating with both through openings made for that purpose. *b* and *b′* are ports in the chamber E. F is the grading and air flue communicating with the chamber E and also with the hopper P, and extending upward past the opening of the hopper L, which hoppers are hereinafter more particularly referred to. The port *b* enters the wall D, and the flue F and chamber E communicate with each other through the port *b′*. G and G′ are valves or slides arranged to cover the ports *b* and *b′*, respectively, and are attached to conveniently-accessible fastenings, by means of which the ports may be opened and closed to any desirable extent. H is also a port in the wall D, and H′ is a slide or valve to operate in connection with the port H.

I is a hopper to receive the grain, and I′ is a grain-slide which constitutes the bottom of the hopper. *c* is an opening in the front side of the hopper, and *c′* is a hinged valve hung over the opening *c*, as shown. J is a sieve extending from the slide I′ to the front of the shoe, the front end of the sieve being the lowest. K is a grain-slide arranged below and extending a little way forward of the sieve J, and J′ is a sieve parallel to the sieve J, and extending forward from the slide K. K′ is a grain-slide arranged below and extending considerably forward from the slide K. All these slides incline in the same direction as the sieves J and J′. J″ is a seed-sieve, inclining in an opposite direction from the sieves J and J′, and K″ is a grain-slide continuous with the sieve J″. All these sieves are removable. L is a pocket or hopper, into which is conducted the grain which has passed through the sieves J and J′. The hopper L is provided with an opening, through which the grain issues, and this opening is closed by the hinged valve *e*, which holds the grain back until a sufficient amount accumulates in the hopper to lift the valve, and thus release itself. By this arrangement the grain is deprived of the downward impetus it would otherwise have. The grain enters the hopper in small volume, and at a high rate of speed, but issues therefrom in larger volume and at a low rate of speed.

L′ L′ are short flues passing through the slide K″, and arranged at short distances from each other. M is a seed-slide extending downward and forward from the slide K″, as shown. N is the bottom of the hopper L, and also forms a slide to carry the grain into the grading air-flue F. N′ constitutes one side of the hopper L, and also serves to direct the air-current which passes through the flue F. N″ is a deflecting and a dividing board; but in some cases I employ it as a deflecting-board alone, by extending it to the front of the separator, and providing there an opening to allow the air to escape. O is a grain-slide, attached to which are the hoppered drawer-bottom *o* and the back *o′*. It may be constructed, however, without the bottom and back. It may also be constructed with a back, and with sides rising slightly above the slide. *n* is an opening to allow the grain to fall from the slide O into the bottom *o*, and *n′* is an opening to allow the grain to fall from the bottom. *n″* is an opening in the front of the separator, and *n‴* is a hinged valve hung over this opening, as shown. The slide O is pref-

erably arranged so as to be adjustable or capable of being drawn in and out and held in any desirable position by means of suitable fastenings. It may, however, be rigid. P is a receiving and discharging hopper, arranged below the plane of the lower wall of the flue F, and communicating with the flue through an opening, *n'*, formed through the said wall of the flue. This hopper receives the heavier grain which has fallen through said flue, and discharges it from the separator through a smaller opening, the object being to prevent the downward escape of the volume of air in the flue.

m' is an opening near the bottom of the flue F to admit of the latter being cleaned. Q is an adjustable deflector, arranged to operate in connection with the port *b'*, and R is a crank rigidly attached to the shaft or spindle of the deflector Q, so that the latter may be set at any desired inclination. S is a shaft resting in bearings in the frame A, and S' is a driving wheel or pulley on the said shaft. T is a wheel or block set eccentrically on the shaft S. In order that the eccentricity of this block may be easily varied, I deem it preferable to make holes near its center, but at different distances therefrom, as shown at *v v*. I also deem it preferable to cut or serrate the periphery of the block, as shown at *v' v'*, or in some similar way render the periphery irregular. T' is a plate attached to one side of the separator, and arranged for contact with the block T. T'' is a cushion arranged under the plate T'. U is a reacting-spring for holding the shoe to the block or wheel T.

The operation of the various parts now described is as follows: The air is forced into the tube by means of any blower suitable for that purpose, and passes through the tube C' into the chamber E. From the chamber E a portion of the air passes through the flue F, and from thence either upward through the body of the separator, or out of the front thereof. A portion of the air enters the body of the separator through the port *b* in the wall D, and operates in connection with the sieves J and J'.

The grain to be cleaned and graded is placed in the hopper I, and passes thence through the opening *c* and upon the sieve J. The hinged valve *c'* is crowded upward by the grain, and prevents it from being spattered. A part of the grain which thus reaches the sieve J will be supported by it, and pass out at the front of the shoe, while the remaining part will fall upon the slide K and sieve J'. In like manner a part of the grain which falls upon the sieve J' will pass through it and fall upon the slide K' and sieve J'', and the remaining part will pass out through the front of the shoe. The grain which falls upon the slide K' will fall thence upon the sieve J'', and pass thence upon the slide K''. The grain then falls into the hopper L. The seeds pass through the sieve J'', and fall upon the slide M, which conducts them out through the front of the separator. The grain which has fallen into the hopper L issues therefrom by escaping under the hinged valve *e*, and passes into the grading air-flue F. The grain here meets the blast or supporting current of air in the flue F. This blast or current carries the lighter grain over upon the slide O, while the heavier grain falls into the hopper P, thus effecting a separation. From the slide O the light grain may pass out under the valve *n'''*. Instead, however, of passing directly out of the separator in this manner, it may first fall upon the hoppered drawer bottom *o*, when such a bottom or drawer is employed.

The valves H' and G', or either of them, may be set for the purpose of regulating the force of current, which acts upon the grain upon, and passing through, the sieves J and J'. The direction of this current may be varied by adjusting the deflector Q for that purpose.

While the grain is passing through the shoe the shaft S should be rotated in order to give a laterally-swinging movement to the shoe. The irregular periphery of the eccentric T produces a jarring movement of the shoe, while the latter is pushed to one side by the eccentric, and the cushion T softens the blow which the shoe receives. The plate over the cushion prevents the latter from being worn away. The spring U holds the shoe firmly to the eccentric.

By means of this construction and arrangement of parts, the grain will be thoroughly cleaned of loose and light foreign particles. The ends will be separated from it, and the grain will be graded into different grades.

The air-currents can be controlled with facility, and none of the operating parts are liable to get out of order.

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

1. In a grain-separator, the hinged valve *e*, arranged substantially as shown and described, with relation to a grain-receiving pocket and a grain-grading or a grain-separating air-flue, for the purpose specified.

2. In a grain-separator, the pocket or hopper L, provided with the hinged valve *e*, in combination with one or more cleaning-sieves, arranged above said pocket, and with a grading air-flue arranged below the said pocket, substantially as and for the purpose specified.

3. In a grain-separator, the combination, with the grading air-flue F, of the hopper P, arranged below the plane of the lower wall of said flue, substantially as and for the purpose specified.

4. In a grain-separator, the combination, with the air-chamber E, of the grading air-flue F, and hopper P, arranged below the plane of the lower wall of said flue, substantially as and for the purpose specified.

5. In a grain-separator, the deflector Q, one or more cleaning-sieves, arranged above and

forward of said deflector, and the air-receiving chamber E, having therein the adjustable port *b*, arranged behind the said deflector, all combined substantially as and for the purpose described.

6. In a grain-separator, the air-chamber E, provided with the port *b*, arranged to discharge a current of air to and in contact with one or more cleaning-sieves, and the port *b'*, communicating with the air-flue F, as and for the purpose specified.

7. In a grain-separator, the combination of the pocket L, air-flue F, and the hopper P, arranged below said flue, so as to receive the grain direct from the flue, and discharge it from the separator, substantially as specified.

JOHN J. WEST.

Witnesses:
F. F. WARNER,
N. C. GRIDLEY.