



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. 52,071, dated January 16, 1866.

*To all whom it may concern:*

Be it known that I, E. C. PATTERSON, of Chicago, Cook county, and State of Illinois, have invented a new and Improved Grain Separating and Cleaning Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of one side of my improved machine. Fig. 2 is a longitudinal section, taken in a vertical plane through the center of the machine. Fig. 3 is a top view of the machine. Fig. 4 is a top view with the hopper removed.

Similar letters of reference indicate corresponding parts in the several figures.

The first part of my invention relates to a novel mode of regulating the flow of grain from the hopper upon the separating-sieve, whereby a free and uniform flow of the grain is maintained and all liability of the discharge-aperture of said hopper clogging up is prevented.

The second part of the invention relates to a hinged apron for conducting off oats and sticks from the first grain-sieve, which apron is so applied to the sieve-shoe or shaker, that it can be thrown up when it is desired to inspect the sieve beneath it.

The third part of my invention relates to a mode of supporting the sieve-shoe and the grain-sieve therein, whereby they receive independent shaking motion from an eccentric-shaft, said shaft acting directly on the grain-sieve and through a strap on the shoe, as will be hereinafter described.

The object of the fourth part of my invention is to provide for chaffing the grain preparatory to its entrance into the blast-spouts by means of the same machine which is employed for blowing away the dust, light grain, and other foreign substances at the place where the grain enters the trunk of the fan-case.

The object of the fifth part of my invention is to more effectually control the effect of the blast upon grain of different specific gravities at the point where the grain falls into the trunk of the fan-case.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the frame of the machine, and B represents a fan-case, which is located at one end of the frame and so constructed as to communicate with a trunk, C, that has a longitudinally-inclined bottom, C' C<sup>2</sup>, extending from one end of the machine to the other beneath the fan-chamber, as shown in Fig. 2. The hinged part C<sup>2</sup> of this bottom can be set at different inclinations with respect to the part C', so as to prevent the escape of good grain when the blast is acting upon it. This tail-piece C<sup>2</sup> may be extended by setting upon it a piece, *n*, which, when desirable, may be removed. The tail-piece C<sup>2</sup> should always extend beyond the discharging end of the sieve F, so as to catch the good grain and conduct it into the trunk C. This extension beyond the said end of the sieve F is made by the piece *n*, but it may be made on the piece C<sup>2</sup> itself. The main object in having a piece, *n*, is that it shall be removable and not used when the kernels of grain are uniformly of about the same specific gravity.

D represents the fan, the shaft of which extends transversely across the frame A, and may be driven by any convenient means. Directly above this fan an opening is made through the fan-case B, which is covered at certain times by a hinged door, *a*, as shown in Fig. 2.

Above the fan-case B and its trunk C is an inclined shoe, E, which is supported near its ends by means of four flat springs, *b b*, two of which are shown in Fig. 1 attached to the posts of the frame A. At the upper end of this shoe E a sieve-frame, F, is loosely attached, which sieve-frame extends downward so as to discharge the grain over the opening *c* of the trunk C, as shown in Fig. 2.

At an intermediate point between the ends of the frame A, and arranged beneath the shoe E and its sieve-frame, is a horizontal transverse eccentric shaft, G, to which a strap, *d*, is attached at one end by a loose ring. The opposite end of this spring-strap is connected to a transverse bar, *e*, that is secured to the side pieces of the shoe E. Upon this bar the sieve-frame F rests when it is not acted upon by the eccentric shaft G. The shaft G is eccentric for the greater part of its length for the purpose of giving the sieve-frame F a rapid

vibrating movement by lifting it up and then suddenly dropping it upon the cross-bar *e*; but the most important object of this long eccentric shaft is to admit of the steel strap *d* being adjusted and set at different points between the ends of the shaft, so that this shaft will not be worn too much at one point. The strap *d*, being made of steel, will not wear away very rapidly, but as the shaft *G* is made of soft iron it will wear away and require the strap to be adjusted. When the shaft *G* is rotated it gives a longitudinally-shaking motion to the shoe. At the same time this shaft gives an independent motion to the sieve-frame.

Directly above the screen *F* is an apron, *H*, which is pivoted at its upper end to the sides of the shoe *E*, so that the apron can be thrown up when it is desired to inspect or get at the screen *F* which is beneath it. The space between the upper end of the apron *H* and the upper end of the shoe *E* is covered by a grain-screen, *g*, through which the grain, grass-seed, chaff, &c., pass freely, but which separates the oats and sticks, which latter pass on the apron *H*, and are conducted off at the lower end, but at the sides of the shoe, by the oblique strips *h h* on said apron.

At the upper end of the shoe *E* a transverse plate, *j*, is attached by means of short arms, so that the plate will project into the narrow discharge-opening of the hopper *J*, as shown in Figs. 2 and 3. This plate has one edge notched like a saw, and it receives a reciprocating motion corresponding somewhat to that which is given to the shoe, and serves to prevent the discharge-opening of the hopper from clogging with grain, &c. This plate *j* will also assist in keeping up a constant flow of grain from the hopper.

The operation of my machine is as follows: Grain which is to be cleaned and deprived of all foreign substances is put into the hopper *J* and flows down to the discharge-opening, from which it is compelled to escape by the motion of the saw-plate or feeder *j*. The grain first falls upon the sieve *g*, which separates the oats and sticks from it and allows it to fall through upon the screen *F*, while the larger substances than grain pass over the apron *H* and escape from the openings *i i* at the sides of the shoe *E*. As the grain and small seed move downward upon the screen *F* the small seed escape into the movable receptacles *K L*, the grass seed into the first and larger seed

into the second receptacle. The grain passes off at the lower end of the screen *F* in a thin stream into the trunk *C* of the fan-case, and in falling it is subjected to a strong blast of air from the upper end of the trunk *C*, which air is directed upward by the hinged tail-piece *C'*. (Shown in Fig. 2.)

The tail-board *C'* can be raised or lowered to any desired pitch, working as it does upon a hinge or pivot. The board *n* can also be raised or lowered, so as to prevent any grain from blowing over which you may desire to retain, or to allow all such grain as you may desire to blow over along with the chaff, dust, and other foreign substances.

For the purpose of "chaffing," raise the lid or door *a* in the fan-case and reverse the motion of the fan. By this adjustment the blast of air will be thrown out through the door *a* and directly under the receiving ends of the sieves *F g*. After the chaffing process the grain may again be passed through the machine; but in such second operation the motion of the fan is such as to blow a blast of air through the trunk *C* of the fan-case, and the lid *a* is closed.

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

1. The construction and arrangement of the saw-toothed agitator *J* in the manner and for the purpose described.

2. The hinged apron *H*, in combination with the shoe *E* and grain-riddle *g*, substantially as described.

3. The construction and arrangement of the eccentric shaft *G*, so that it gives motion directly to the screen *F* and also vibrates the shoe *E*, substantially in the manner described.

4. The shaft *G*, which is eccentric from one end to the other, in combination with the narrow strip *d*, which is adjustable longitudinally on the shaft, substantially as described.

5. The construction of the fan-case with the parts *B C' C' n a*, and applying it in respect to the upper and lower ends of the sieves substantially in the manner and for the purpose described.

6. The adjustable tail-piece *C'*, in combination with the fan-case *B* and trunk *C*, substantially as described.

E. C. PATTERSON.

Witnesses:

Z. F. CHASE,  
CHAS. L. STILES.