(No Model.)

A. SCHULTZ.

GRAIN CLEANING MACHINE.

No. 247,694. Patented Sept. 27, 1881.

Fig. 1

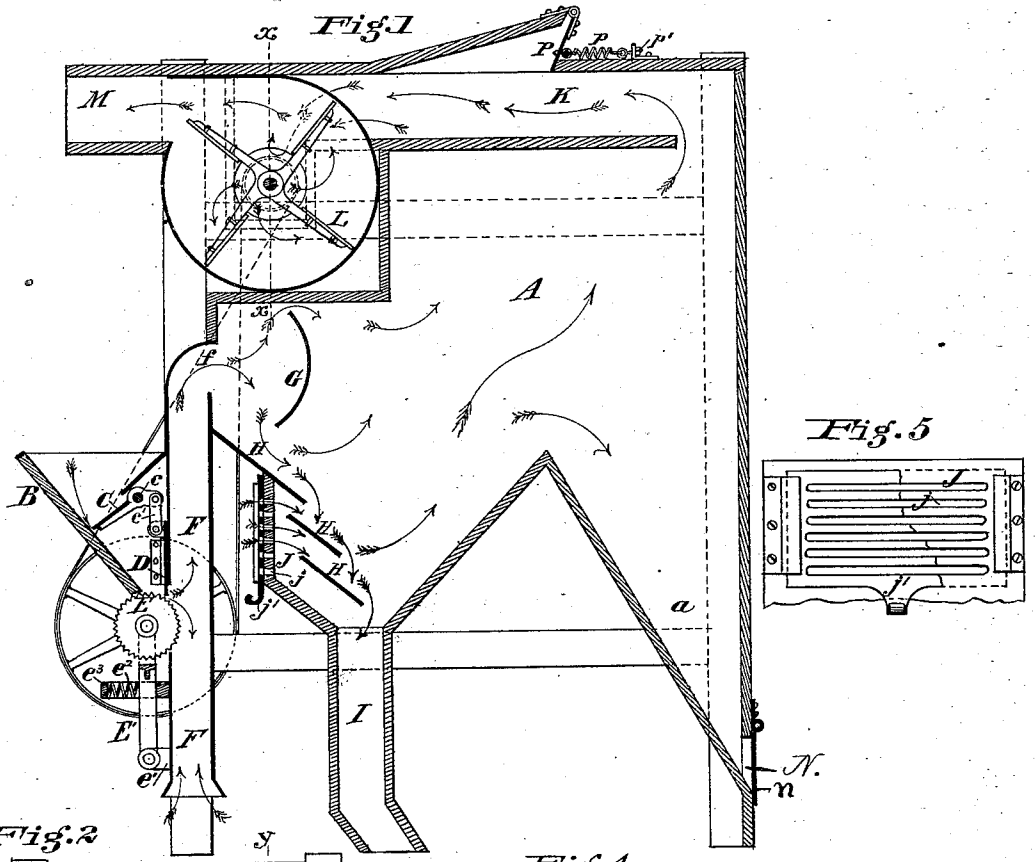


Fig. 5

Fig. 2

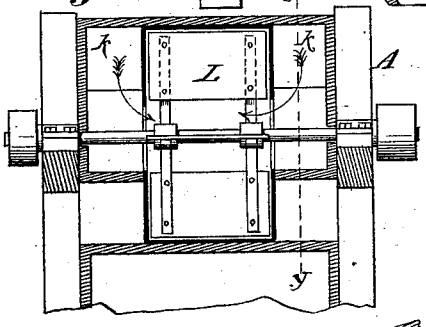


Fig. 4

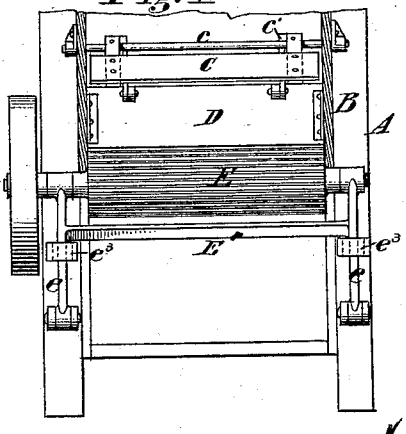
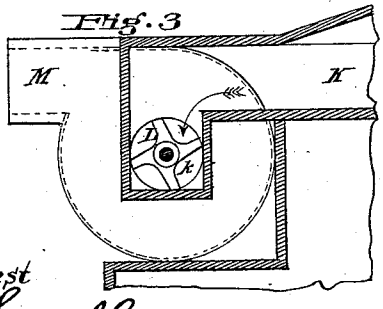


Fig. 3



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UNITED STATES PATENT OFFICE.

ADAM SCHULTZ, OF CINCINNATI, OHIO.

GRAIN-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 247,694, dated September 27, 1881.

Application filed March 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, ADAM SCHULTZ, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Grain-Cleaning Machines, of which the following is a specification.

My invention is in the nature of an improvement upon that class of separators or grain-cleaning machines which employs a current of air to raise and carry off the lighter matter to be separated from the grain.

The grain is fed into a hopper upon the side of the machine upon an apron which swings within upon suitable pivots, and adapts the opening through which the grain passes to the rate at which it is fed to the machine, in order that no air shall pass into the exhaust-fan except through the proper channel.

Below the swinging apron a grooved roller mounted in bearings upon a swinging frame, and driven by a belt, feeds the grain into a vertical duct or spout, upward through which the air is drawn by the exhaust-fan previously mentioned.

The current of air is graduated (by means to be described hereinafter) so that all material no heavier than the grain will be drawn up the spout, and all material heavier than the grain will fall down the spout and be discharged from the machine. The grain and all lighter material, when it reaches the top of the spout, is drawn against a curved fender, which diverts the grain and some of the lighter material downward and some of the lighter material upward. From the curved fender the grain falls on a series of inclined shelves or baffle-plates, between which currents of air are drawn by the exhaust-fan. From the lower one of the shelves the cleaned grain falls into the spout, from which it is drawn into the bins.

The direction of the air put in motion by the exhaust-fan is always from below upward, and as the grain falls over the shelves all the lighter material is drawn upward and discharged through the fan.

Behind the inclined shelves or baffle-plates a perforated partition is placed, the apertures in which are covered by a correspondingly-perforated plate, which, when slid backward or forward across the partition, graduates the openings through which the air is drawn. By this means, should the current of air in the vertical duct or spout be strong enough to lift material heavier than the grain, the power of the current may be reduced by opening the slide and allowing more air to pass into the machine between the inclined shelves, or vice versa.

A valve upon the top of the machine, controlled by an adjustable spring and opening inward, limits the rarefaction of the air within.

I will now describe the machine in detail, and then specifically point out the improvements in the appended claims.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved machine. Fig. 2 is a cross-section through the exhaust-fan. Fig. 3 is an elevation of the exhaust-fan, with the conducting-spouts in section, taken on the line *y y*. Fig. 4 is an elevation of the feed-roller, and Fig. 5 is a detached view of the perforated partition and slide.

Similar letters of reference indicate similar parts.

A is the frame-work and body of the machine, usually made of wood and joined with screw-bolts.

B is the hopper, into which the grain is shoveled or spouted.

C is the swinging apron, pivoted at *c* and provided with links *c'*, which engage with and control the position of the sliding gate D. The gate D slides in ways or grooves attached to the frame of the machine above the feed-roller E. The feed-roller is grooved to facilitate the passage of the grain forward into the air duct or spout F.

e e are the arms of a swinging frame, E', which are pivoted at their lower ends to the frame by means of standards *e' e'*. Spiral springs e^2 e^2, set in stirrups e^3 e^3, press the swinging frame E' and feed-roller E forward, but are yielding should any foreign substances—as stones or sticks—be thrown into the hopper with the grain, by which means such matter is passed through without injury to the machine and deposited with the heavy refuse matter at the foot of the air-duct F. The air-duct F terminates at its upper end in a curved hood or deflector, *f*, which directs the current of air and the grain carried along with it against the

curved fender G, which in turn distributes the lighter matter upward and the heavier matter downward, as shown by the arrows in Fig. 1.

H H H are inclined shelves or baffle-plates, upon which the grain and heavy matter from the air-duct F falls, whence the cleaned grain descends into the spout I.

J is a perforated partition, the apertures *j j j* in which are graduated by means of the similarly-perforated slide *j'*. (Shown more in detail in Fig. 5.) By closing more or less the apertures in the partition J, the velocity, and consequently the carrying-power, of the air ascending the spout F is adapted to lift the grain and all lighter matter, while all heavier matter will, by virtue of its gravity, fall to the bottom of the duct or spout F and be discharged from the machine.

K is a horizontal duct or air-passage, through which the air and matter suspended in it is drawn into the exhaust-fan L through the branch ducts *k k*, which deliver the air and refuse to the center of the fan, whence, by the centrifugal force generated by the revolution of the vanes of the fan, it is expelled from the machine through the spout M.

A small quantity of grain will at times be carried in the upward current of air through the body of the machine, beyond the shelves H H H, and fall into the compartment *a*, from which it may be withdrawn, as it accumulates, through the opening N. A swinging or sliding gate, as shown at *n*, closes the opening N after the grain has been removed.

P is the inwardly-opening air-valve, placed upon the top of the machine, which is closed by the spring *p*, provided with an adjusting-screw, *p'*, to adapt the force with which the valve is held to its seat to the requirements of the machine.

The swinging apron C and the sliding gate D being arranged to automatically adapt the openings through the hopper B and over the feed-roller E to the amount of grain supplied the machine, the passage of air into the vertical duct or spout F is thereby prevented, and all air exhausted by the fan L is therefore compelled to enter the machine through the spout F and the apertures *j j* in the partition J.

Having described my invention, what I claim is—

1. In a grain-cleaning machine, the combination, with the frame A and the vertical air-duct F, of the exterior hopper, B, extending laterally from one side of the frame, and in communication with the vertical air-duct and the laterally-yielding grooved feed-roller E, arranged at the bottom portion of the hopper, and projecting into the vertical air-duct, for delivering the grain directly into the latter from the hopper, substantially as described.

2. In a grain-cleaning machine, the combination, with the frame A, of the exterior hopper, B, extending laterally from one side of the frame, for receiving the grain from the outside of the same, the pivoted vertically-swinging apron C, extending across the hopper to the outer side of the same, the vertically-sliding gate D, arranged to close and open the passage from the hopper to the interior of the machine, and connected with the rear end of the swinging apron, and the grooved feed-roller E, arranged at the bottom portion of the hopper, for delivering the grain from the hopper into the machine, substantially as described.

3. In a grain-cleaning machine, the combination, with the frame A, of the hopper B, extending laterally from one side of the frame, the vertical air duct F, having a lateral opening in communication with the hopper, an exhaust mechanism in the upper portion of the machine, the feed-roller E, arranged at the bottom portion of the hopper, for delivering the grain from the same to the vertical air-duct, the vertical pivoted standards *e'*, supporting the feed-roller, and springs *e²*, acting on the standards, all substantially as and for the purpose described.

In testimony whereof I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

ADAM SCHULTZ.

Witnesses:
JOHN W. HILL,
EDGAR J. GROSS.