2 Sheets—Sheet 1.

A. J. HARTWELL.

Grain-Separators.

No. 207,416. Patented Aug. 27, 1878.

Fig. 1.

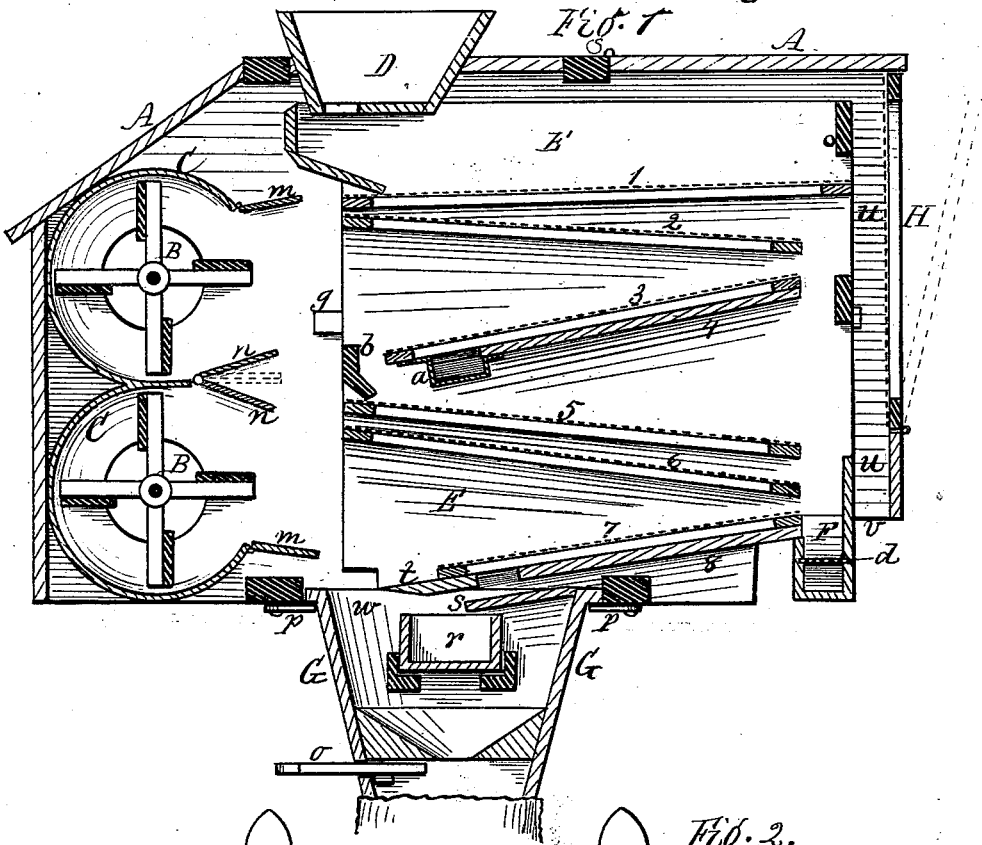
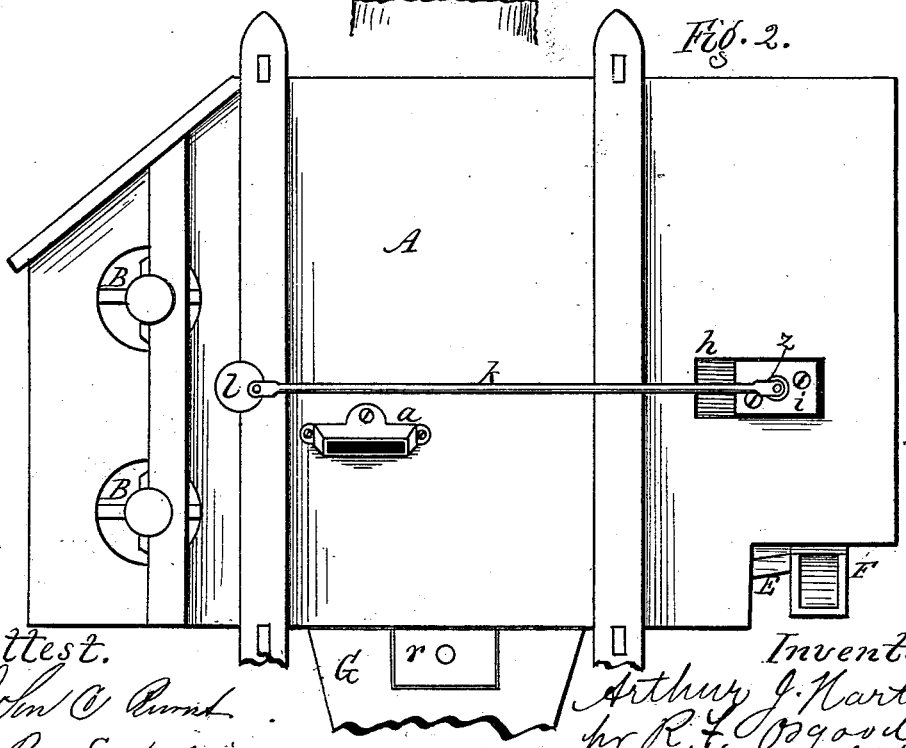


Fig. 2.



Attest.
John C. Purnt.
R. E. White

Inventor:
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per R. F. Osgood,
Atty.

A. J. HARTWELL.

Grain-Separators.

No. 207,416 **Patented Aug. 27, 1878.**

Fig. 3.

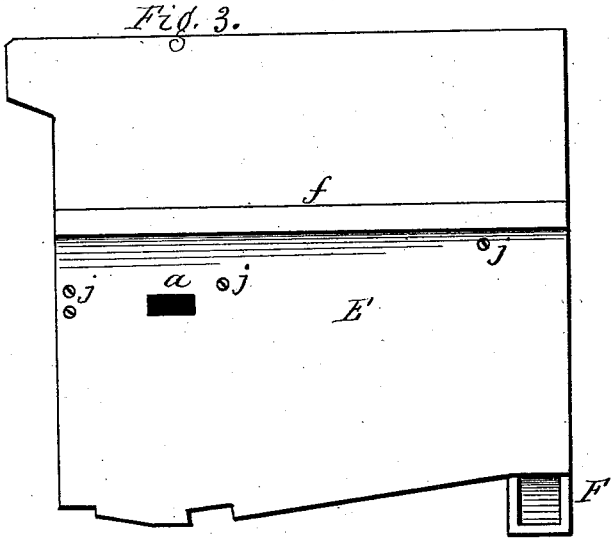


Fig. 4.

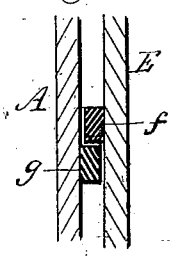


Fig. 5.

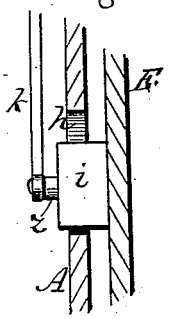


Fig. 6.

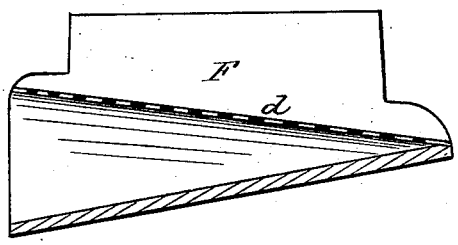
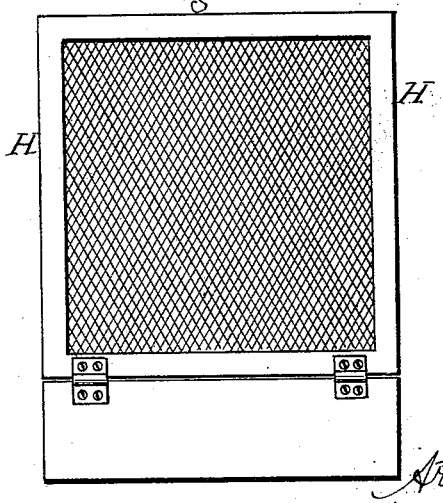


Fig. 7.



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UNITED STATES PATENT OFFICE.

ARTHUR J. HARTWELL, OF BROCKPORT, NEW YORK.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **207,416**, dated August 27, 1878; application filed May 11, 1878.

To all whom it may concern:

Be it known that I, ARTHUR J. HARTWELL, of Brockport, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Fanning-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section. Fig. 2 is a side elevation. Fig. 3 is a side elevation of the shoe. Figs. 4, 5, 6, and 7 are detail views.

My improvement relates to those fanning-mills in which two fans are employed for strengthening and equalizing the blast, and obviating the necessity of running the grain through twice. Such mills are already known.

My invention consists in the combination, with two fans, of a novel arrangement of valves, whereby the combined blasts may be more accurately directed and regulated, and also in other parts, which will be more fully described hereinafter.

In the drawings, A represents the casing and frame of the machine, which may be of ordinary construction. B B are the two fans, which are located one above the other, and situated in fan-cases C C, which are open on the sides next to the screens. These fans may be operated by any desired means.

D is the feeding-hopper, on top the machine and over the screens. E is the shoe which holds the screens. The upper screen, 1, is a chaffing-screen, which removes the coarser dirt and allows the grain to pass through. Screen 2 separates oats. Screen 3 separates cockle. The chess-board 4 carries the cockle to a spout, *a*, which runs it out through the side of the machine. The stop *b*, which is attached to the end of the shoe, turns the grain down upon screen 5. Screens 5 and 6 are for separating barley. Screen 7 is for separating chess, which passes over chess-board 8 into the drawer of the bagging-spout. All the screens except the upper one are made short, to drop the tailings into a spout, F, attached beneath the tail end of the shoe. The bottom of this spout inclines in one direction, and in it is a perforated metal screen, *d*, which inclines in the opposite direction, as shown in Fig. 6. The oats are separated by this perforated screen, and pass off to one side, while barley and other grains which pass through the perforated screen are discharged by the bottom of the spout in the opposite direction. This is a convenient device for making a clean separation of the oats from the refuse. The screen *d* is made removable, so that one of a different gage may be applied at any time.

The screen 3 and its chess-board 4, together with the spout *a*, form one fixture or attachment, and are secured in the shoe by means of screws *j j* passing through the sides of the shoe. The stop *b* is also secured in a similar manner by screws. By first removing the stop *b*, the said screen and chess-board can be removed, and a simple screen put in its place and used in connection with the valves of the fan-cases, in a manner hereinafter more fully described.

The shoe has horizontal cleats *f f* on its sides, which rest on corresponding horizontal ways *g g* on the inner sides of the casing of the mill. Slots *h h* are made through the sides of the casing, in which rest blocks, *i i*, fastened to the shoe. Studs *z*, forming pivots, project outward from the blocks, upon which are pivoted pitmen *k k* on opposite sides, said pitmen receiving motion by crank-wheels *l l*. By this means the shoe is reciprocated forward and back in a horizontal direction, the cleats *f f* riding on the ways *g g* instead of being vibrated laterally or being rocked up and down, as is usually done. The action upon the grain is more effective, as the grain is simply sifted through, while the chaff and dirt pass off without entering the meshes.

m m are hinged valves, hung to the upper and lower edges, respectively, of the two fan-cases C C, on the side next to the screens. *n n* is a double winged valve in the center between the two fan-cases, hinged so that one can turn up and the other down, or both can turn together flatwise. These several valves are operated and set at any angle by means of cords, rods, or other suitable attachments proceeding to the outside of the casing.

By this means the two blasts can be directed and controlled exactly as desired. The two upper valves can be turned upward, and the two lower ones downward, as shown in

black lines, Fig. 1, in which case the two blasts will be diverged and separated from each other, one blowing into the upper and the other into the lower sections of the screens; or the two center valves may be closed together and the two outer valves be turned either up or down in the same direction, as indicated by the dotted lines, thereby throwing both blasts in one, and directing the same either to the upper or lower part of the machine; or the two upper valves may be closed toward each other and the two lower toward each other, in which case each blast is concentrated in a narrower space, producing greater power. Many different adjustments of the blasts may be made, which renders the control of the same perfect. Heretofore, in mills having double fans a single wind-board only has been used, which has power to control but one blast only, and that in a very limited degree, while the other blast is entirely uncontrolled, and the two blasts cannot be concentrated together.

In different kinds and conditions of grain it is necessary to modify the blasts, giving greater force above or below. In some it is desirable to concentrate the blasts in one body with considerable force. In others it is desirable to diffuse it as much as possible. The system of valves above described enables this to be done effectively where two fans are used.

G is a bagging spout or hopper on the under side of the machine, used only when the mill is attached to a thrashing-machine. It is of conical form, has a slide, *o*, in its bottom, and the bag is attached to the end of the spout by hooks or otherwise. The spout is attached to the bottom of the mill by buttons *p p* or other devices, so that it can be readily removed. In the center of the top of this spout is a drawer, *r*, over which rests a discharge-board, *s*, whose outer edge comes under the discharge end of chess-board 8, and runs the chess into the drawer, which is removable. On the outside of the drawer is a space, *w*, communicating with the bottom of the spout, and over this space rests a chute-board, *t*, whose edge rests under the lower end of screen 7, and discharges the cleaned grain into spout. The shape of the shoe is such that the chute-board *t* always covers the chess-drawer and prevents the grain from falling therein.

H is a screen-door, covering the entire discharge at the tail end of the mill. It is used only when the mill is attached to a thrashing-machine. The door is hinged to turn downward, as indicated by dotted lines, Fig. 1. It consists of a frame covered with wire-cloth. It is so attached to the end of the casing as to leave a dead-space, *u*, of considerable extent behind the shoe, with a discharge-throat, *v*, at the bottom, which comes below the spout F. Beneath this throat is placed a suitable receptacle for receiving chaff. The screen-door serves a double purpose. First, such chaff and dirt as are blown off are forced down through the dead-space *u* and out at the throat *v* into the receptacle, instead of being blown over, as in ordinary machines. The powerful blast produced by the two fans is sufficient to do this without filling the spout F. Second, the screen-door prevents the entrance of, and consequent obstruction of the machine by, straw, and also obviates counter-drafts where thrashing is done.

Having thus described my invention, I claim—

1. In a fanning-mill having double fans, the combination, with the fans B B and their cases C C, of the hinged valves *m m* at the upper and lower edges of said fan-cases, and the double-hinged valves *n n* at the center, next the screens, and arranged to be adjusted to different positions to modify and regulate the blasts, as herein shown and described.

2. In a fanning-mill such as described, the hinged screen-door H, covering the discharge end of the mill, having the dead-space *u* and throat *v* between it and the end of the shoe, for the discharge of the chaff into a receptacle below, as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ARTHUR J. HARTWELL.

Witnesses:
R. E. WHITE,
R. F. OSGOOD.