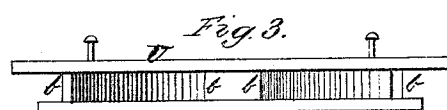
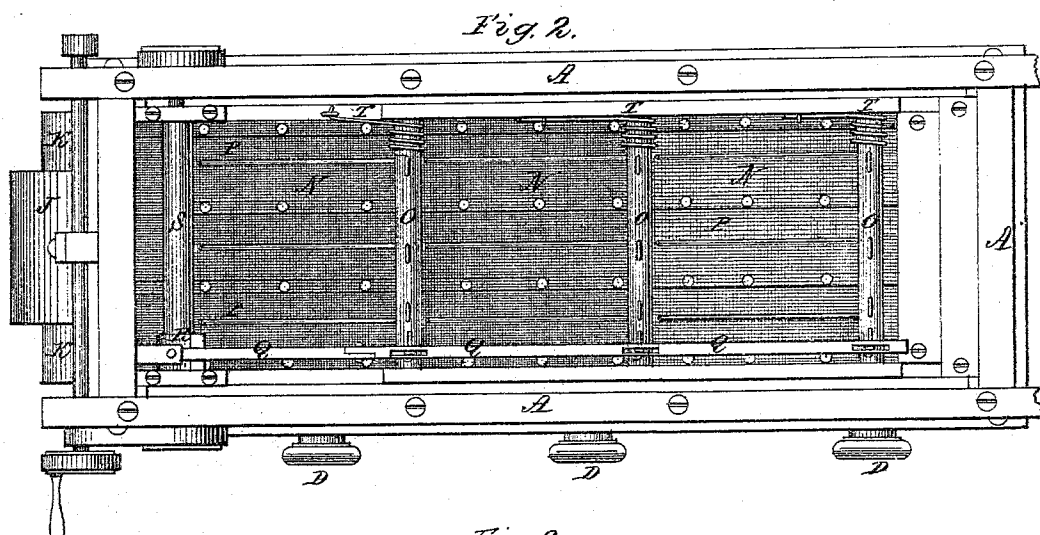
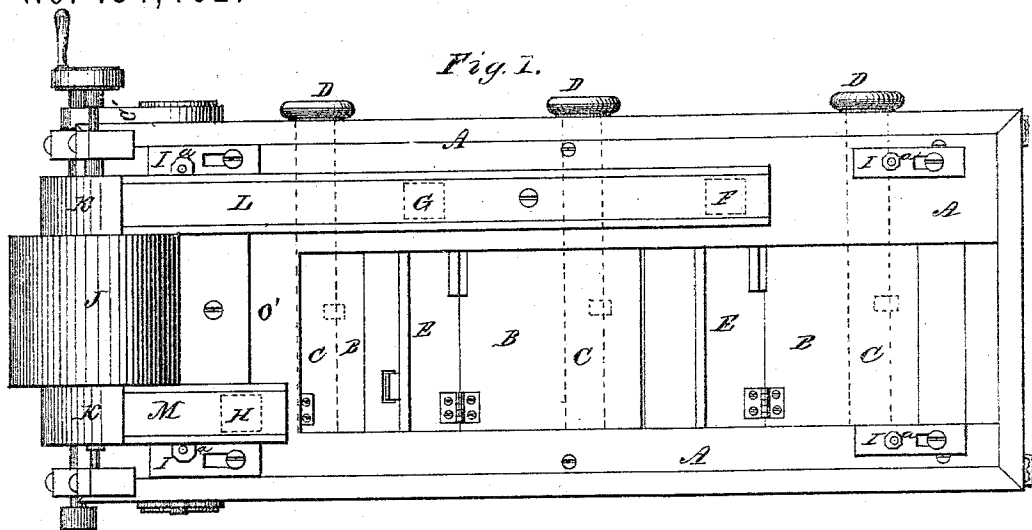


E. CLARK.
Middlings Purifiers.

No. 134,462.

Patented Dec. 31, 1872.



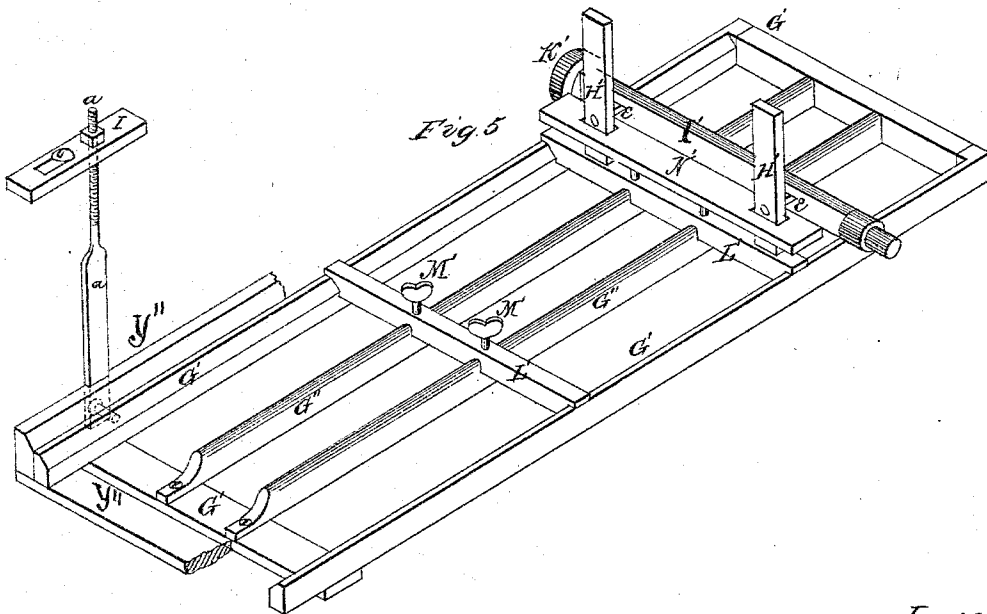
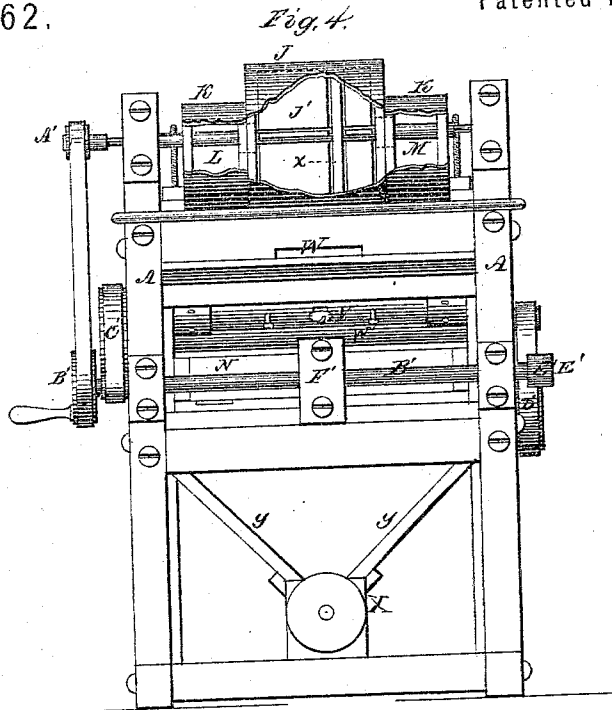
Witnesses
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UNITED STATES PATENT OFFICE.

EDWIN CLARK, OF LANCASTER, PENNSYLVANIA.

IMPROVEMENT IN MIDDINGS-PURIFIERS.

Specification forming part of Letters Patent No. 134,462, dated December 31, 1872.

To all whom it may concern:

Be it known that I, EDWIN CLARK, of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Flour and Middlings-Separator; and I do hereby declare that the following is a full, clear, and exact description thereof that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon which form a part of this specification.

This invention relates to that class of machines known as flour and middlings separators or dressers, and has for its object to furnish an improved machine for the purpose of separating bran from the flour or middlings, leaving the farina or middlings pure and in a proper condition for regrinding, and by this means restoring a large per cent. of the gluten to the starch portion of the wheat, being simple in construction, efficient in operation, and durable in use; and it consists in a reciprocating bolt and beaters operating against the lower side of the bolt-cloth; and in connecting with the beaters mechanism for operating the same; and in the use of knockers on the upper side of the bolting-cloth frame; in the use and operation of the valves for regulating the amount of air passing through the bolt to carry the bran from the flour and farina; and in the construction and arrangement of the flues with the fan and air chambers.

In the drawing, Figure 1 is a top view with a part of the frame-work cut away, showing the interior; Fig. 2 is a bottom view with the conveyer-box and attachments removed; Fig. 3 shows the end piece of the bolting-case; Fig. 4 is an end view of the machine; and Fig. 5 is a perspective view of the bolt-frame and knockers with the cloth removed.

A represents a frame or case for the machine, which may be made in any suitable or desired form, so as to be conveniently adapted to the mechanism of the machine and convenience in construction. B represents the valves, each of which is hinged to the bottom of the air-chamber in which it is placed. Below each

of said valves, and attached to the same, are shafts C suitably journaled in the sides of the frame, one end of which extends outside of the frame, and provided with the knobs D, by which means the valves can be easily and readily adjusted to admit more or less air, as desired. The air-chamber is entirely above the bolt-cloth. E E represent partitions, extending upward and forming chambers for the purpose of allowing the flow of air to be shut off from either of the chambers through the medium of the valves and openings in the air-flues F G H leading to the fan-box. These chambers may be as many in number as desired. I I represent slides supported upon the frame A. Said slides are provided with a slot and screw to regulate their position. To the slides a rod, *a*, is attached which extends downward, and is secured to the frame by a pivot, by which means the ends of the frame are caused to be changed in the throw of the bolt to regulate the discharge from the same. The top of said rods *a* should be threaded and provided with a thumb-screw so as to adjust the vertical position of the ends of the bolt-frame. J represents the fan-box, divided into two divisions by the partition *x*, having a case, K, on each side communicating with the air-flues L and M, said flues extending along on the top of the machine and communicating with the air-chambers through the openings F, G, and H. N represents a cloth, which may be of the usual material, and graded, or not, as desired. Below the cloth N the beaters P are arranged, being attached to the rock-shafts O in any suitable manner. These beaters P may be of wire, wood, or metal, or any other material, but should be arranged to have a beating motion against the cloth N, which I prefer to obtain through the medium of the rock-shafts O, link Q, springs T, and catch and cam R, the cam moving the link Q in one direction, which is pivoted to the rock-shafts, and, being released by the catch from the cam, is drawn rapidly back by the action of the springs T, one end of which being attached to the frame and the other to the rock-shafts, by which means the required motion to the beaters is obtained. The beaters do not strike upon the frame G', but upon the cloth N; and, to pre-

vent damage to the cloth by the beaters, the frame to which the beaters and their operating mechanism are connected has the same motion as the bolt-frame G', so that the beaters move with the same speed back and forth with the cloth N. These beaters should be as many as necessary in number to keep the cloth properly clear. The advantage gained in using the beaters instead of brushes is that the brushes create a constant friction upon the cloth and wear the same, and as the beaters strike the cloth and then at once fall from the same by their weight, the material gathered in the same is raised by the current of air passing through the cloth. U represents the end piece or conveying-spout, which is placed at the end of the bolt to catch the bran or coarse material passing over the end of the bolt, beneath which any receptacle may be placed to catch the same. This spout is formed widest at the top and gradually decreasing in size downward by the inclines *b b*, altogether forming the end piece of the machine. V represents a feed-slide gate, furnished with a slot and set-screw, so as to be adjusted as desired. W represents an opening through which the material passes into the hopper, falling upon the roller W' by which it is carried to the bolt. X represents the conveyer, placed directly below the hopper Y in the usual manner. A' represents the fan-shaft, suitably journaled in the frame. B' represents a shaft having a pulley, E', by which motion is communicated to the machine. On the center of said shaft is a box, F', attached to the frame, in which is placed an eccentric on the shaft for the purpose of giving the vibrating motion to the bolt-frame. O' represents a band or belt, giving motion to the feed-roll W'. The feed-roll W' is provided with a pulley, on one end from which the beaters are operated by means of the belt D'. G', Fig. 5, represents the bolt-frame with the cloth removed. Said frame is made in rectangular form, as shown, and provided with transverse bars L', which are provided with thumb set-screws M' which bear upon the longitudinal bars G'', the object of which is to adjust the cloth by raising or depressing the bars G'', to which the cloth is attached, so that the material will be evenly distributed upon the cloth. By this means either side of the cloth and the center may be adjusted as desired. H' represents knockers passing through suitable guides N', and are provided with projections *e e*, which come in contact with the shaft I', of the construction shown, by which means the knockers H' H' are raised as the shaft revolves until the flat portion of the shaft I' passes the projections *e e*, when the knockers fall by their own weight upon the bar L', thereby jarring the cloth for the purpose of keeping the cloth clear, so that the air may pass through it, and the purified material readily pass through the cloth down

into the conveyer. Motion is conveyed to the shaft I' by a belt from a pulley on the end of the feed-roller to the pulley K' upon the end of the shaft I'.

The operation is as follows: The material is fed by the roller W' upon the cloth of the bolt-frame having the reciprocating motion, by which means and the current of air the heavier part of the bran is carried along the cloth and discharged into the spout U, while the lighter portion of the same is drawn up by suction through the valves B and openings F, G, and H, into the divided fan-box, and discharged at O', while the purified material passes through the cloth into the hopper Y and conveyer X, where it is collected, graded, and discharged in the usual manner. The current of air passing up through the cloth, valves B, and openings F, G, and H, by suction into the fan-box is received from openings on each side of the machine just below the bolt-frame, said current of air being evenly distributed upon the cloth as the valves B open entirely across the air-chambers, which produces a far better result than where the valves open only a short distance from either side or the center, thus causing a draft centered upon the single point corresponding to the length of the valves.

By use of the double fan, in connection with the air-flues L and M, the material drawn up through the openings G and H may be discharged separately at O', and thus making separate grades of the material, which would not be the case where there was only one air-flue upon one side of the machine with openings connecting with the several air-chambers; and by the addition of an air-flue and fan to each air-chamber, the material passing up through the openings above each chamber could be discharged and collected separately.

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

1. The adjustable valves B, hinged in the bottom of the air-chambers and extending across said chamber, in combination with the bolt, substantially as and for the purpose set forth.
2. The adjustable valves B, hinged in the bottom of the air-chamber, in combination with the bolt air-flues L M with openings F, G, and H, and fan, substantially as and for the purposes specified.
3. The combination of the fan-box J, divided into two or more divisions by a partition, *x*, each provided with a fan, with the separate air-flues L and M, substantially as and for the purpose specified.
4. The slides I and rods *a* supporting the bolt-frame, and arranged to be adjusted substantially as and for the purpose described.
5. The combination of the rock-shaft O carrying the beaters P with the bolt-frame and operating mechanism, as shown and described,

or its equivalent, so that the beaters move with the bolt and beat directly upon the cloth, substantially as and for the purpose described.

6. The combination of the knockers H' e, guides N', shaft I', and bar L', constructed and arranged above the bolt-frame, as and for the purpose set forth.

7. The thumb-screws M', or their equivalents, arranged with the bolt-frame G' G'' and

bar L' to adjust the bolt-cloth, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of November, 1872.

EDWIN CLARK.

Witnesses:

JOHN A. ELLIS,
WM. K. ELLIS.