E. S. BARTHOLOMEW.

Middlings-Purifiers.

No. 212,834. Patented Mar. 4, 1879.

Fig. 1

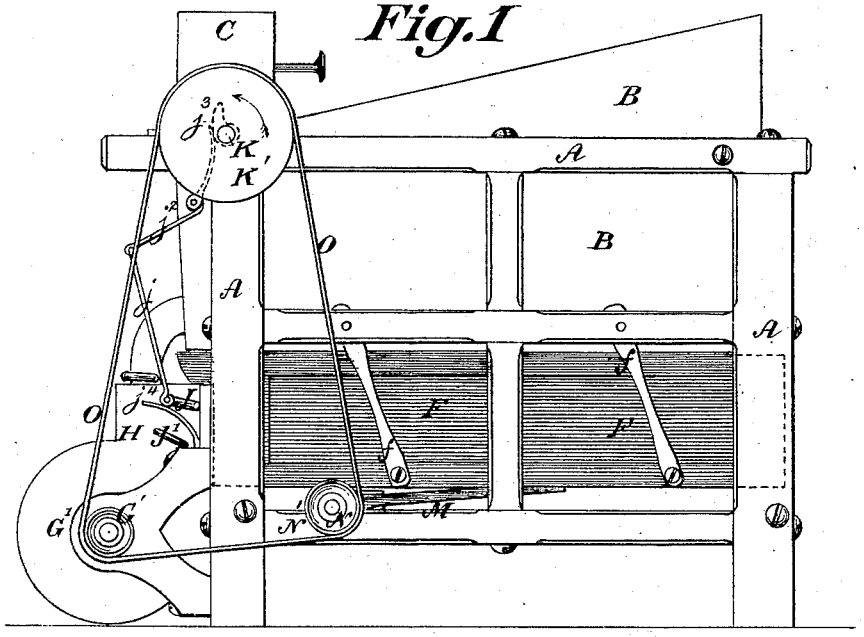
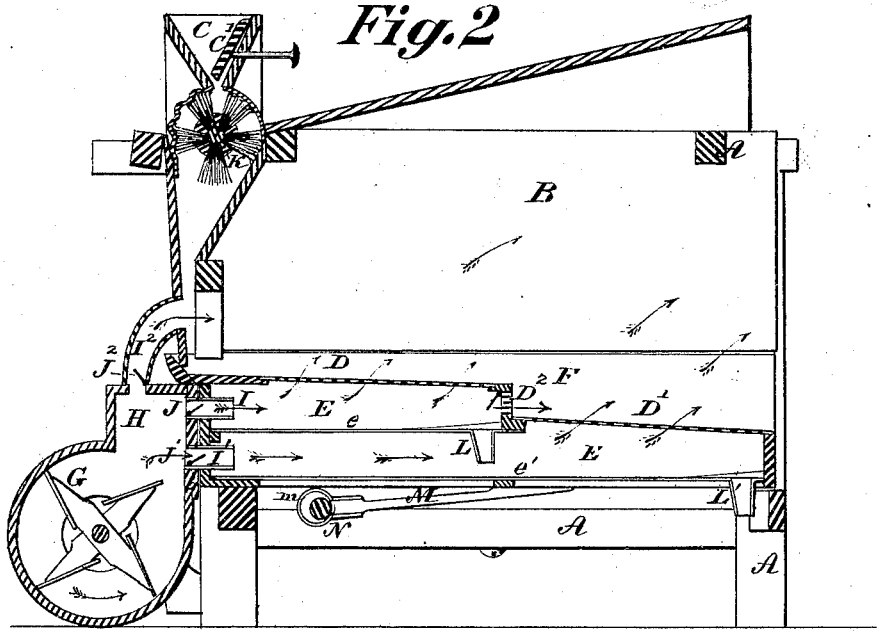


Fig. 2



Witnesses:

Seward Beall

W. T. Hutchinson

Inventor:

E. S. Bartholomew,

by his Atty

Wm. H. Rowe

UNITED STATES PATENT OFFICE.

ESLI S. BARTHOLOMEW, OF MAYSVILLE, ASSIGNOR TO HARRIET T. BARTHOLOMEW, OF AUBURN, NEW YORK.

IMPROVEMENT IN MIDDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **212,834**, dated March 4, 1879; application filed June 27, 1878.

To all whom it may concern:

Be it known that I, ESLI S. BARTHOLOMEW, of Maysville, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Middlings-Purifiers, of which the following is a specification:

The object of my invention is to provide a simple and effectual machine, arranged within small compass, that will enable me to use the full and effective force of the air from the fans to thoroughly winnow the material as it passes through the machine, to facilitate cleaning the screens by means of successive blasts of air, and, furthermore, to feed, convey, and discharge the middlings in an improved manner into, through, and away from the machine, as will hereinafter appear; and the improvement consists, first, in arranging an air-blast port at the head of and above the surface of the screen, and a blast-chamber beneath the screen, in such manner that the blast up through the screen will raise the lighter particles above the material upon the screen, in order that they may be acted upon by the upper blast, which passes in a sheet across the screen-surface and carried directly away thereby; second, in combining a screen, an upper draft or blast chamber, a blast-chamber beneath the screen, and an intermittently-operating valve that admits the air in puffs beneath the screen and serves to clear its meshes, and, furthermore, tosses the material above the surface of the screen, which operation materially facilitates the action of the upper drafts upon the lighter particles; third, in arranging graded screens one to follow the other at a lower elevation in the same chamber, and providing both screens with separate blast-chambers beneath them, so that the lower screen will catch the tailings of the upper forward screen and be subjected to an independent blast, all these parts being suspended and vibrating together in the same frame, as will hereinafter appear; fourth, in combining the graded screens, arranged one to follow the other, and a suitable distance below its level, the blast-chambers, arranged separately beneath the screens, and separated from each other by a delivery-plate, and provided with spouts beneath the rear end of the screens to deliver the material from the tail end of the floor of the upper air-chamber to the floor of the second chamber and away from the tail end of the lower delivery-board; fifth, in arranging the graded screens in the manner described, one following the other at different levels, and providing blast-openings in the riser between the screens.

In the accompanying drawings, Figure 1 is a side elevation of a machine embodying my improvements, and Fig. 2 a central longitudinal section of the same.

A suitable frame, A, supports a hood or dust-chamber, B, securely attached to its upper members, and at the head of which is arranged a hopper, C, provided with an arrangement for regulating and distributing the feed, as hereinafter described.

The screens D D′ have blast-chambers E E′ arranged beneath them, and are secured to a boxing, F, that is suspended by links *f f* directly beneath the dust-chamber.

A fan-blower, G, and wind-trunk H is arranged at the head of the machine, and is provided with ports I I^1, that communicate with the wind-trunks beneath the screens, and also with a port, I^2, that admits the blast into the dust-chamber immediately beneath the feed-hopper and above the head of the screen D, so that as the material falls from the hopper to the head of the screen it is intercepted by the blast from the port I^2, and freed from a portion of its dust before it falls upon the head of the screen, and thus relieves the screen of unnecessary incumbrance. The port I^2 also directs the blast across the surface of the screen, and carries off any impurities that are raised even slightly above the surface of the screen by the blast from beneath it. A valve, J^2, is arranged in the port I^2, and serves to regulate the force of the blast. This valve may be placed directly over the mouth of the port, so that its area may be decreased by closing the valve, and thus project a thinner sheet or sharper blast across the screen when desired. The port I has a valve, J, and the port I^1 a valve, J^1, to regulate the blast in the chambers E E′.

The valve *j* is operated by a rod, j^1, and bell-crank lever j^2, with a cam or wiper, j^3, secured to the main driving-shaft K, so that at each

revolution of the shaft the valve will be opened and closed. A spring, j^4, presses upon the crank j, and serves to keep the valve open. By this means an intermittent blast is secured beneath the screen, which will toss the material up and let it fall again upon the screen.

When it is tossed up it is met by the current of air passing over the screen and freed from fiber, and then falls upon the screen, and after a moment's lapse of time, during which the granules may pass through the sieve, another puff of air from beneath the screen will raise the lighter material again from the screen, and so on until it reaches the tail of the machine and is discharged. Instead of shutting off entirely at intervals, a constant draft may pass through the screen to prevent light particles of dust from passing through with the purified middlings, and an intermittent puff or increased blast may serve to toss the middlings up from the screen, as above described. This puffing blast will serve to clear the meshes of the screen, so that they will rarely require brushing.

The screens D D^1 are arranged one following the other, and in such manner that the head of the screen D^1 adjoins and is a suitable distance below the level of the tail end of the screen D. The blast-chambers E E′ are separated by the delivery-plate e, which is raised on the sides at the discharge end to form a concave or trough that will direct the purified middlings to the spout L, which deposits them upon the lower delivery-plate, e', of the blast-chamber E′, and which is of similar construction to the plate e, and is also provided with a spout, L′, by which the middlings are finally discharged from the machine.

By means of the graded screens, arranged as described, with separate blast-chambers and a common dust-chamber, a simple construction and economy of space are obtained, giving an increased area of unobstructed space at the rear end of the machine for the discharge of dust.

The riser D^2, arranged between the screens D D^1, is perforated or slotted, and may be provided with a valve to regulate the opening, and thus serves to admit a sheet or blast of air from the chamber E across the material falling from screen D to screen D^1, and also across the surface of the screen D, in the same manner and for the same purpose described with the port I^2.

The boxing F, with its screens, air-chambers, and spouts, suspended, as above described, from the frame, is vibrated back and forth by means of pitmen M M, operated by cams $m\,m$, secured to a counter-shaft, N, driven from a pulley, K′, on the driving-shaft K. All of the material, both upon the screens and in the draft-chambers, is thus kept in motion and fed along from the head to the tail ends of the screens and chambers in a simple and effectual manner.

The vibrating boxing can be easily removed by disconnecting the links $f\,f$, so that the screen may be repaired, or other portions of the machine reached, without difficulty. A belt, O, passes from the pulley K′ of the driving-shaft, and over the pulley N′ on the counter-shaft and G′ on the fan-blower shaft, and serves to operate them.

The feed-hopper C is provided with a side flap, C^1, hinged at its upper edge and adjusted by means of a set-screw, so that the opening between the lower edge of the flap C^1 and the opposite side of the hopper may be increased or diminished.

A scouring-brush, C^2, on the shaft K fits closely in a concave, C^3, within which it revolves, and serves to partly disintegrate and evenly distribute the material upon the cant-board C^4; and by means of the valve or hinged flap C^1 the feed can be readily and nicely adjusted.

I hereby disclaim as my invention the interfering matter contained in the application of William L. Teter now pending before this office.

I claim as my invention and desire to secure by Letters Patent—

1. The combination of a shaking screen and a fan having blast-ports above and below the screen, the upper of said ports being arranged to direct the blast over the surface of the screen and operate upon the material lifted by the lower blast, as set forth.

2. The combination of the screen, a blast-chamber above the screen, a blast-chamber below the screen, and an intermittently-operating valve to close the lower blast, substantially as described.

3. The combination of the graded screens, arranged one below and to follow the other, and provided with separate blast-chambers, all supported and moving in the same frame.

4. The graded screens arranged one to follow the other below its level, the blast-chambers arranged separately beneath the screens, the grain-delivery plate forming the floor of the first chamber, and provided with a spout beneath the rear end of the screen to deliver the material from the tail end of the upper chamber to the floor at the head of the lower chamber, substantially as described.

5. The combination and arrangement of the graded screens, one following the other, and a riser connecting them provided with blast-openings to permit the blast to sweep the lower screen, as set forth.

ESLI S. BARTHOLOMEW.

Witnesses:

O. J. WILLARD,

RINALDO ADAMS.