

No. 142,023.

Patented August 19, 1873.

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A. HUNTER & C. E. WHITMORE.

Middlings Purifiers.

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Fig. 3.

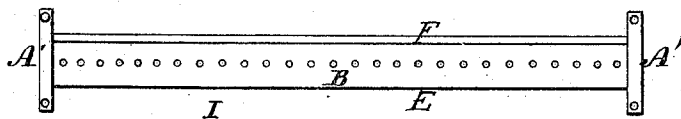
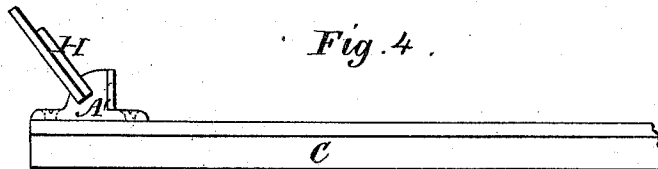


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

ANDREW HUNTER AND CHARLES E. WHITMORE, OF QUINCY, ILLINOIS.

IMPROVEMENT IN MIDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. 142,023, dated August 19, 1873; application filed June 16, 1873.

To all whom it may concern:

Be it known that we, ANDREW HUNTER and CHARLES EDWARD WHITMORE, of Quincy, county of Adams, State of Illinois, have invented a new and useful Improvement in Purifying Middlings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, Sheet 1, is a longitudinal vertical section through the machine, showing the relation of the blast and suction compartments to the bolt and the direction of the currents of air, and also the arrangement of the agitators. Fig. 2, Sheet 1, is a side elevation of the same. Fig. 3, Sheet 2, is a top-plan view of the feed trough or tray for spreading the middlings evenly upon the screen or bolt; and Fig. 4, Sheet 2, is an end view of the same applied to a section of the screen.

Similar letters of reference in the accompanying drawings denote the same parts.

Our invention consists, first, in combining a blast and suction fan in separate compartments, the blast-fan operating first on the fine, and the suction on the tailings containing the coarse middlings as they pass over the screen, in combination with other mechanical devices for agitating or lifting the middlings as they pass over the bolt of the machine, as will be set forth. It consists, secondly, in combining a vibrating feed-trough with a screen or bolt for the purpose of receiving, spreading, and discharging middlings evenly on such screen or bolt, as hereinafter described.

A is the frame of the machine. *a* is the main driving-shaft, arranged with driving-pulleys for conveying motion to the fans and conveyor; also arranged with cams or ratchet-wheels for imparting motion to the screen through the levers and other devices. The suction-fan F is placed near the discharge end of the machine, and operates on the tailings that contain the heavy coarse middlings, that part being usually discharged in with the ship-stuff or offal, but now made available by our new operation or combination without wasting any good material.

The operation of our improved machine may be described as follows: The machine being set in motion, the middlings to be purified are

fed onto the spreader H, thence into trough I, and are evenly spread onto the end of screen C. The middlings passing over the screen, the pure are precipitated next the cloth, and the brown particles raised on top according to their specific gravity, the action of the wind from the blast-fan being such that it does not raise the heavy middlings from off the cloth and mix them with the brown particles; but the blast has sufficient force to raise and carry off the brown fuzzy particles that cannot be removed by a bolting-cloth. The middlings, as they pass out of the first compartment W, enter another, when a suction-fan is used. The middlings or tailings, as they enter the second compartment V, are coarse, the fine having been sifted through, the current of air from the suction-fan being of sufficient force to remove the heavy brown particles without sustaining any loss of good middlings. The bran and other impurities that have not been removed by the action of the fans pass off over the end of the screen.

By the use of the above combination the necessity for returning and repurifying the middlings is avoided.

The above-described action of the fans upon the middlings may be assisted, if desired, by vibrating rods or agitators *b*, attached to arms or levers B, mounted on rock shafts or pivots *b'*, which have their bearings in the frame A, or in uprights *a'* secured thereto. A vibratory or rocking motion is imparted to the shafts, which are connected with each other by rods *c* by means of a pivoted link or lever, *c'*, and a connecting-rod, *c''*, connecting the rod *c* with a crank, *c''*, as shown in Fig. 2, and the rods *b* strike the under surface of the bolting-cloth or its supporting-wire, thereby giving additional agitation to the middlings passing over the same where required, and assisting the action of the currents of air passing through the bolt in the operation of raising and carrying off the lighter particles of bran. The connection of rod *c''* with the crank is such that it may be readily detached when the condition of the middlings is such that the air of the agitators is not needed.

From the foregoing description, taken in connection with the drawings, it will be seen that the actions of the blast and suction fans

are independent of each other—that is, the suction-fan is additional to and outside of the machine and frame, working in an extension of the frame and over an extension of the tail end of the screen, and operating upon the tailings after they leave the machine proper, as the same has heretofore been constructed, and supplementing the action of such constructions by a more powerful draft or suction of air than could be safely used over the main portion of the bolt.

The feed-trough is constructed with closed ends A', and with its inner side E lower than the outer side F. It is also constructed with perforations in its bottom, and is securely fastened to the end of the screen and transversely thereof to receive the middlings from the spreader H throughout its width. Motion is imparted to the feed-trough by the screen, so that the middlings, as they are fed or discharged into the feed-trough, are leveled and sifted through evenly onto the screen. If the perforations in the feed-trough are not of sufficient capacity to permit the passage of the middlings as fast as they are fed to the trough, the surplus middlings flow over the lower side of the trough and are evenly spread upon the end of the screen.

If desired, the feed-trough may be suspended from the frame of the machine, instead of being secured to the screen, and a lateral or

longitudinal vibration imparted to it by any suitable means.

Having now described our improvements in middlings-purifiers, we wish to state we have not described that portion of the machine that has been patented by us in former patents for purifying middlings.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for purifying middlings, a blast and suction combined with a screen, the currents of air therefrom acting in separate and independent compartments, substantially as set forth.

2. The agitators arranged to oscillate beneath the screen for the purpose of striking transverse blows upon the under side of the screen or bolt covering, substantially as described.

3. The vibrating feed-trough, constructed with a perforated bottom, and with the inner side E lower than the outer side F, substantially as described, and for the purpose specified.

In testimony whereof we have hereunto set our hands this 9th day of June, A. D. 1873.

ANDREW HUNTER.

CHARLES EDWARD WHITMORE.

Witnesses:

JOHN W. CRAIG,

WALTER SCOGGAN.