2 Sheets--Sheet 1.

W. W. HUNTLEY, A. P. HOLCOMB & A. HEINE.

Middlings-Purifier.

No. 163,074. Patented May 11, 1875.

Fig. 2.

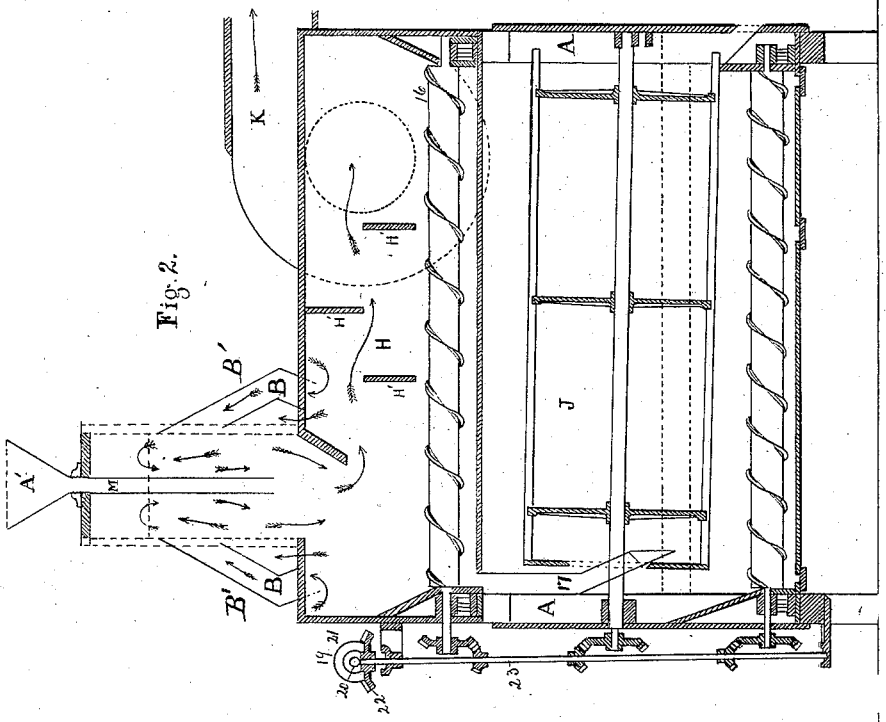
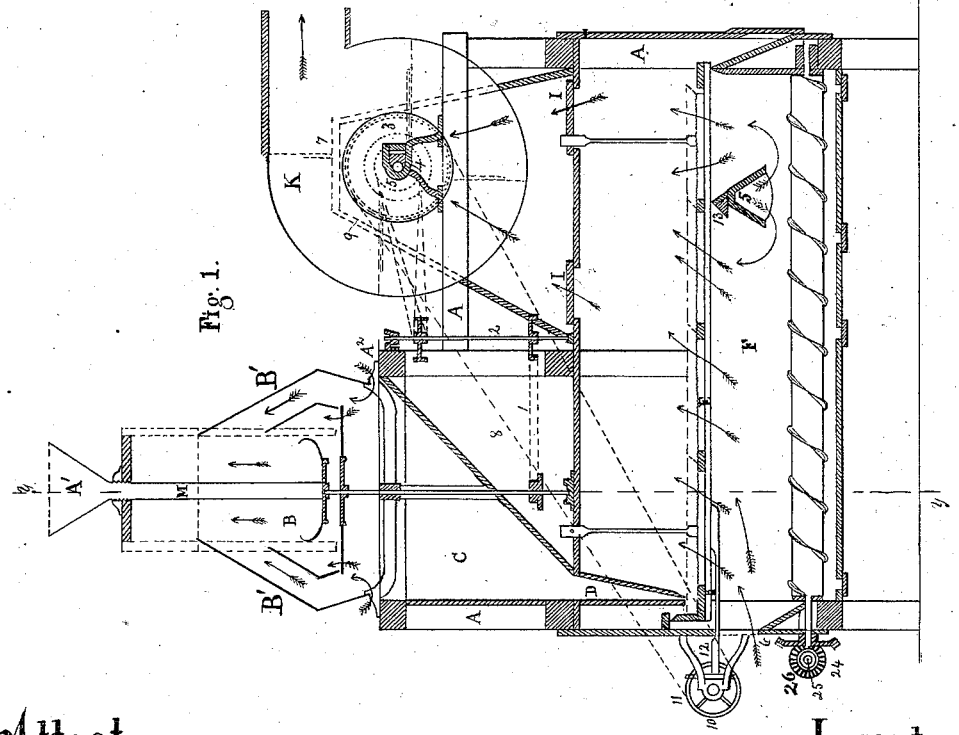


Fig. 1.



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2 Sheets--Sheet 2.

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Fig. 4.

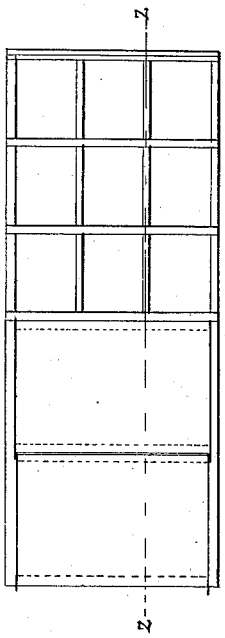
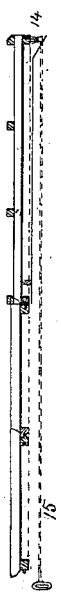


Fig. 5.



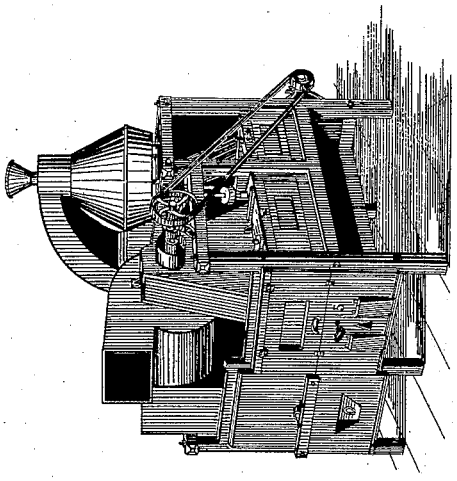
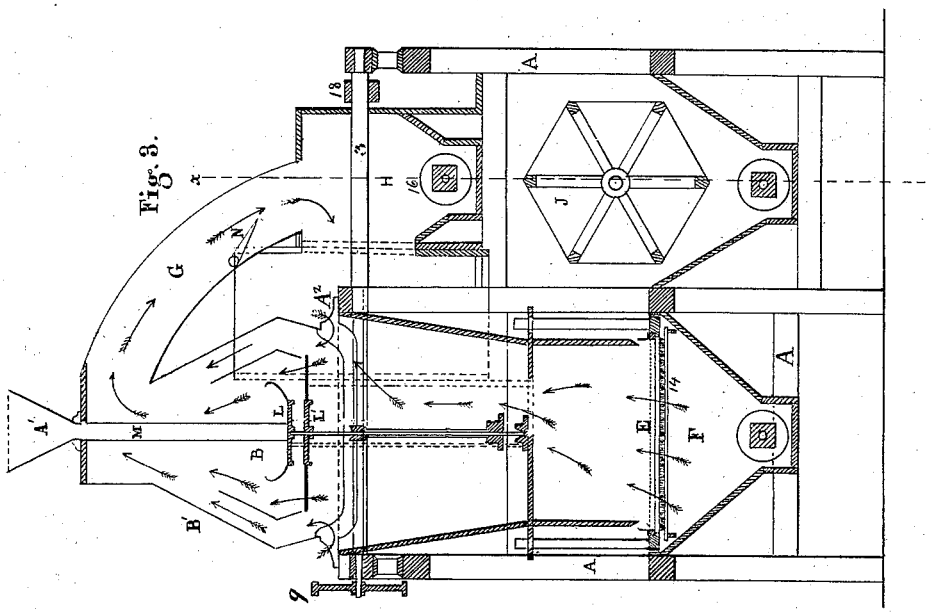


Fig. 6.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM W. HUNTLEY, ABEL P. HOLCOMB, AND AUGUST HEINE, OF SILVER CREEK, NEW YORK.

IMPROVEMENT IN MIDDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. **163,074**, dated May 11, 1875; application filed March 13, 1875.

To all whom it may concern:

Be it known that we, WILLIAM W. HUNTLEY, ABEL P. HOLCOMB, and AUGUST HEINE, of Silver Creek, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Middlings-Purifiers; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification—

Figure 1 being a central vertical section, showing the adjustable feed-hopper and its tube, the double disintegrator, the hood through which the air passes into the revolving bolt, the fan for producing the air-blast, the spout which conducts the disintegrated middlings to the reciprocating sieve, the location and arrangement of such sieve, an air-induction passage for permitting air to pass to such sieve, a cut-off placed upon the top of said air-induction passage, mechanism for driving the different parts, and a conveyer for carrying the material to the different outlets. Fig. 2 is a vertical transverse section on line *x x* of Fig. 3, showing the revolving bolt and a conveyer for the material which passes through said bolt, and the mechanism for driving the same. Fig. 3 is a transverse section on line *y y* of Fig. 1, showing the dust-deposit chamber with its conveyer, and the direction which the air-current which passes through the reciprocating sieves takes, and also the direction of the current which passes through the dust-deposit chamber, with its point of entrance to the machine. Fig. 4 is a plan view of the reciprocating sieve, showing a portion of the frame-work thereof as located above the sieve. Fig. 5 is an elevation of the reciprocating sieve, showing also a brush, which is designed for occasional use upon the under surface of the sieve; and Fig. 6 is a perspective view of the completed machine.

Corresponding letters denote corresponding parts in the several figures.

This invention relates to machines for purifying middlings; and it consists in the construction, combination, and arrangement of some of the parts of which it is composed, as will be more fully described hereinafter.

In constructing machines in accordance with our improved plans we use a suitable frame-work, A, of such dimensions as to cause it to receive and support a bolt and sieves of the required capacity, and also such as to enable it to receive and support the other parts of the machine, its construction being substantially such as is shown in the drawings. Upon the top of the frame A is placed a spider, A^2, which is secured thereto, and upon the upper surface of which there are formed slots for the reception and support of the double hood B B′. The construction of this hood is clearly shown in Figs. 1, 2, and 3, it being such that its lower edge rests upon the spider A^2, while its greatest diameter is some distance above such point, from which largest point to its upper end it is in the form of a frustum of a cone. Inside of the outer case B′ of this hood, and at some distance from it, there is an interior portion, B, which in cross-section is similar in form to the outer portion, but which is of a different length, its lower end terminating just above the lower arms of a disintegrator soon to be described. The distance between the two sections of this hood will be varied according to the other dimensions of the machine to which it is to be attached; but in all cases is to be such as to permit a portion of the air which passes to the machine at this point to pass through it, while another portion passes up through the interior of the portion B. Upon the top of the above-described hood there is placed one end of a wind-trunk, G, the under side of which communicates freely therewith, its opposite end being attached to the dust-deposit chamber H.

In order that provision be made for the introduction of the material to the machine the upper surface of that portion of the wind-trunk which is central above the hood is provided with an aperture through which passes a tube, M, the upper end of which is provided with a hopper, A′, into which the material to be operated upon is placed, and from which it passes through the tube M to the disintegrator. This hopper and its tube are made

adjustable vertically, in order that, by raising or lowering it, the amount of middlings delivered to the machine in a given period of time may be regulated. The disintegrator above alluded to is located within the hood, and is composed of a vertical shaft revolving in suitable bearings, its lower end resting and turning in a step placed upon a portion of the frame-work. Upon the upper end of this shaft there are secured two disks of metal, upon the upper surface of the upper one of which the middlings, as they leave the tube M, are deposited, and by which they are distributed. The periphery of this upper disk is provided with apertures, into which are inserted curved arms of metal, which serve as whippers or beaters, and which partially disintegrate the middlings, and at the same time throw them at different angles against the interior surface of the inner portion of the hood, by which they are deflected downward toward the hopper or spout C, and as a consequence of which they are brought in contact with another series of whippers or beaters, which radiate from the lower disk of the disintegrator, which completes the whipping or beating process, the material all this time being subjected to the action of a current of air induced by a fan, and which takes away the fine particles of bran and other foreign substances which have been disintegrated or loosened from the valuable parts of the middlings, and carries them to the dust-deposit chamber. The valuable portion of the middlings, after having been thus treated, is delivered into the hopper C, from which it is spouted through D to the reciprocating sieves, where it is subjected to the action of a current of air, which enters through one or more apertures, 5, formed in the casing of the machine, as shown in Fig. 1, and through an aperture, 6, formed in the end of the machine, as shown in the same figure. This portion of the air-blast is induced by the same fan that causes the current which passes through the wind-trunk G; or, if preferred, it may be caused by a separate one. The direction which this portion of the air takes after entering the apertures above alluded to is clearly shown by arrows, it passing from below the sieves to the chamber above them, and onto a wind-trunk, 7, by which it is directed to one eye of the fan. The force of this portion of the blast is controlled by means of valves I I, which are located in the passage between the chamber in which the sieves are located and the wind-trunk which conducts the air to the fan.

The reciprocating sieves have motion imparted to them by means of a belt, 8, which passes over a pulley, 9, placed upon the main driving-shaft 3 and over a pulley, 10, on the end of a horizontal shaft, 11, portions of which are turned eccentric in form for the purpose of causing them to give motion to connections 12, which unite with the sieve and produce the reciprocating movement alluded to. The motion above mentioned causes the material to be carried over the sieve, portions of which are covered with cloth of finer texture or mesh than the rest, in order that the material may be separated into different grades of fineness as it passes through into the conveyer-chamber below. In order that provision may be made for changing the quality of the different parts of the cleaned material by making each part as a whole coarser or finer an adjustable cap, 13, is placed upon the air-induction passage 5, which may be adjusted nearer to or farther from the head of the sieves, and thus direct more or less into the different compartments of the chamber, in which there is placed a conveyer, as shown in Fig. 1, which carries the material to the different outlets.

It sometimes happens that in grinding certain kinds of wheat, or in the case of particular methods of grinding, that a portion of the sieve near the point where the material is delivered upon it will become clogged with particles of the middlings; and to enable the operator to clean such portion of the sieve at such times a brush, 14, is arranged to slide in grooves formed in the frame-work of the machine, or on cleats attached thereto. To this brush a handle, 15, is attached, which extends to the opposite end of the machine, where it may be operated by the hand of the person in attendance, whenever it becomes necessary, for the reasons above described.

As above described, that portion of the air-current which enters through the hood B B′ and wind-trunk G is caused to pass into a deposit-chamber, H, its passage or intensity being controlled by a valve, N, located in said wind-trunk, and so arranged that it may be made to leave a greater or smaller aperture for the passage of the air. This air-current takes from the middlings, while they are being beaten, any foreign substance that is freed from them, and carries it into the dust-chamber H, which is provided with a series of projecting obstructions, some of which depend from the top of the chamber and extend toward the bottom thereof, while the others are secured to the bottom and extend upward beyond the lower edges of the others, so that between them there is formed a series of compartments, in which the dust is deposited. Experience has demonstrated that in the dust deposited in this chamber there is material, which, when properly separated from the dirt, particles of bran, and other foreign substances which are deposited with it, may be put upon the market and sold as a lower grade of flour than that made from the purified middlings. The quality of this flour will, of course, depend to a considerable extent upon the character of the wheat ground and of the grinding; but in any case will be found to be of considerable value.

For the purpose of adapting our machine to the proper separation of this material, we place in the lower portion of the dust-deposit chamber a conveyer, 16, which conveys all of the material which lodges thereon to the head

end of the revolving bolt J, where it passes through a spout, 17, to the interior of said bolt. The spout 17 is provided, near its lower end, with an inwardly-swinging valve for controlling the delivery of the material to the bolt, it being so arranged for the purpose of enabling it to prevent the passage of air upward through the spout, and for the further purpose of causing it to open by the gravity of the material that falls upon it, and so allow it to pass into the bolt. The bolt J is to be properly clothed, and with such cloth as will cause the proper separation of the material, the cloth which we prefer to use upon the first portion, say, two-thirds of the length of the bolt, being No. 11, and the remainder No. 9. Below this bolt there is another conveyer for carrying the flour to the discharge-apertures, which are placed in the bottom of the conveyer-chamber, and are covered by slides which may be wholly opened, or partially so, as circumstances require. The flour and dust thus separated may be carried to any desired location for final deposit.

Motion is imparted to the different parts of this machine in the manner shown, a belt from any prime mover passing over a pulley on the shaft 3, which gives motion to the fan K, which is attached to said shaft, and its case being provided with the usual outlet. Upon or near the outer end of the shaft 3 there is placed a small pulley, 18, from which a belt passes to and over a pulley, 19, which is fast upon a short shaft, 20, on which there is a beveled wheel, 21, which meshes into a wheel, 22, fixed upon a vertical shaft, 23, on which are secured the wheels necessary to turn the conveyers above and below the revolving bolt. The beveled wheel which revolves the lower one of the conveyers last referred to gives motion to a wheel, 24, which is placed upon a horizontal shaft, 25, and meshes into a wheel, 26, upon the conveyer-shaft, that is placed under the reciprocating sieve.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a machine for purifying middlings the combination, substantially as described, of a fan for producing an ascending air-current, a whipper or agitator for disintegrating the material, a reciprocating sieve for separating the middlings after they have been acted upon by the whipper or agitator into different grades, and a revolving bolt for separating any flour that may be carried from the disintegrator by that portion of the air which passes it, from the the worthless material which passes with such flour, the parts being arranged to operate substantially as set forth.

2. The double-acting disintegrator, it being composed of two series of whippers or beaters, the upper ones being curved upward at their outer ends for the purpose of causing them to more effectually beat and disintegrate the material, and the lower ones being straight and extending outward to or beyond the inner surface of the interior hood.

3. A double conical hood, constructed with an air-passage between the two portions thereof, through which an ascending air-current passes, in combination with whippers or beaters, arranged to operate substantially as and for the purpose set forth.

4. In a machine for purifying middlings, the combination, substantially as described, of a disintegrator, a fan for creating an air-current, a revolving bolt, and a dust-deposit chamber, the parts being arranged to operate substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our own invention, we affix our signatures in presence of two witnesses.

WM. W. HUNTLEY.
ABEL P. HOLCOMB.
AUG. HEINE.

Witnesses:
A. H. SPAULDING,
J. I. LANPHERE.