

(No Model.)

H. J. WOOLCOTT.
MILLING MACHINERY.

No. 468,735.

Patented Feb. 9, 1892.

Fig. 1.

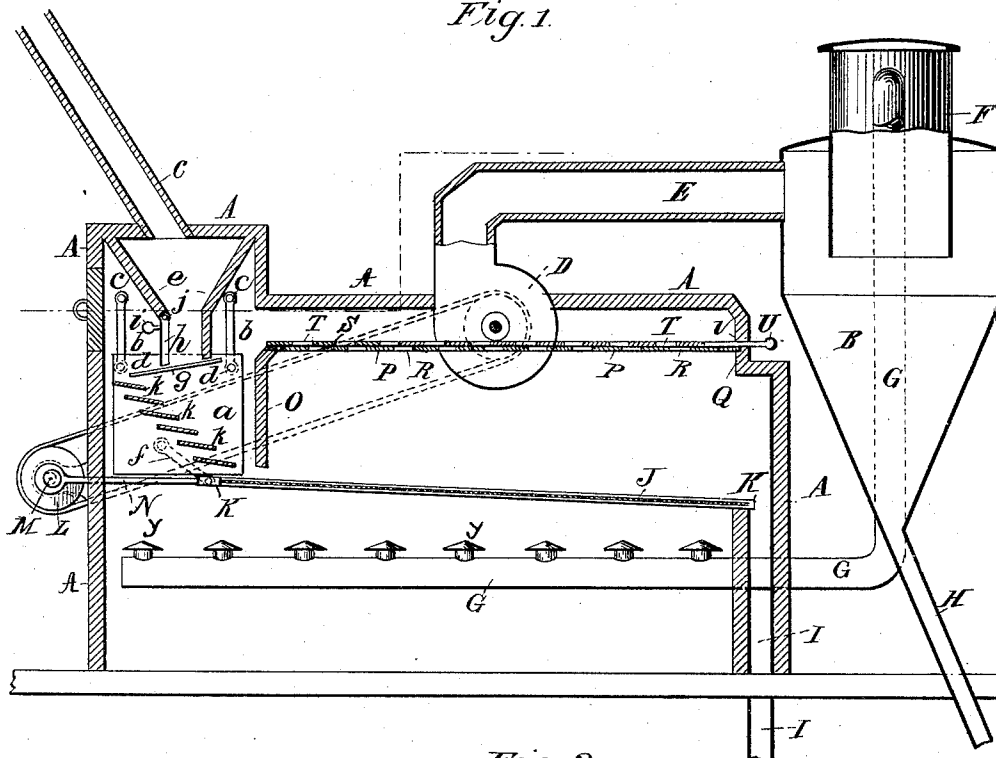
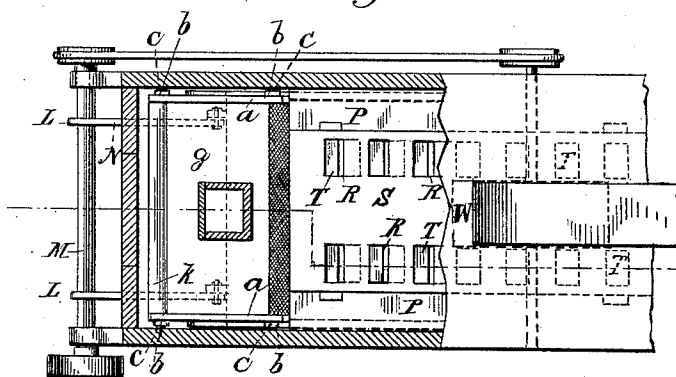


Fig. 2.



WITNESSES:
Edward C. Rowland.
J. E. Hoffman

INVENTOR
Henry J. Woolcott
BY *Phillips Abbott*
his ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY J. WOOLCOTT, OF MARINER'S HARBOR, ASSIGNOR OF ONE-HALF TO
BENJAMIN B. STEWART, OF PORT RICHMOND, NEW YORK.

MILLING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 468,735, dated February 9, 1892.

Application filed May 29, 1891. Serial No. 394,488. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. WOOLCOTT, a citizen of the United States, and a resident of Mariner's Harbor, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Milling Machinery, of which the following is a specification.

My invention relates to milling apparatus; and it consists in improvements in the "middlings-purifier" and "dust-collector," so called.

My present invention is an improvement upon that for which I obtained Letters Patent of the United States No. 456,231, dated July 21, 1891, and to that patent I refer for a more full description of the construction, purposes, and operation of the apparatus; and I will practically confine the description of this present case to those parts which specially pertain to it, excepting to simply indicate the other parts that the drawings may be more easily understood.

Figure 1 illustrates a longitudinal section of the purifier and dust-collector on the line *xx* of Fig. 2. The upper part of the dust-collector is, however, shown in elevation. Fig. 2 illustrates a plan view, partly in section, taken on the line *yy* of Fig. 1.

A is the case or chest of the purifier.

B is the dust-collector.

C is the feed-spout to the purifier.

D is the fan.

E is the wind-trunk.

F is the closed cap or chamber on the upper part of the dust-collector, which forms an important part of my said prior invention.

G is one of the return air-ducts which connect with the dome F above the point where the wind-trunk E enters it.

H is the delivery-spout from the dust-collector.

I is the delivery-spout for the tailings from the bolting-cloths or sieve.

J is the bolting-cloths or sieve.

K is the frame for the same.

L are eccentrics on a shaft M, which are connected with the bolting-cloth or sieve frame by links N, whereby the shaft being rotated, the sieve or bolting-cloths are agitated in a well-known manner.

O is a partition placed across the purifier from side to side extending downwardly almost to the bolting-cloth frame.

P is a partition, which entirely closes the upper part of the purifier. It extends from the partition O to the other end of the purifier at Q, and makes close contact air-tight or substantially so with both sides of the purifier-chest throughout. In this partition-board are openings R, and S is a sliding valve-board or air-regulator provided with openings T, which are made to more or less coincide with the holes R in the partition-board P by pulling or pushing upon a handle U, which projects through a suitably-constructed stuffing-box at V (not shown) in the chest, to the outside thereof. This stuffing-box is simply to preclude the entrance of air at this joint or rather such free entrance of it as that atmospheric impurities in the factory shall be drawn in thereat. The sliding valve-board S, in the special construction shown, spans the fan-casing, and has an opening W (see Fig. 2) longer than the fan-casing in it, whereby it may be moved longitudinally to cover or uncover the holes R in the partition-board P.

Y are the hoods in the return air-ducts G, which are fully explained in my said former application. The ducts G, one or more of them, as may be preferred, extend through the purifier-chest to the front end thereof.

I now come to the part of my present invention which may be said to be the most material single feature thereof, although of course they are related to and coact with the other elements described.

My said former invention has exceeded my expectations in utility and value; but I have discovered that a large percentage of the fine impurities can be removed from the middlings by dropping them through space while subjected to an air-blast prior to their reaching the sieve or bolting-cloth, and that consequently the purification upon the sieve is much more perfect. I therefore now combine with the other elements or devices an attachment whereby this prior purification is effected. It is as follows: *a a* are a frame, or rather end plates, of wood or other suitable material. They are hung by four links *b b b b* to the side of the purifier-chest by

pivots *c c c c*, there being corresponding pivots *d d d d* at the other ends of the links which enter the end plates or frame *a a* near their upper edges. The frame (or end plates) *a* is located immediately beneath the feed-spout *C*, or rather its hopper *e*, and it is connected with the bolting-cloth or sieve frame *K* by a pivoted link *f*, whereby it is agitated by the same agitating devices which agitate the sieve, and the frame is also placed between the vertical partition *O* and the front end of the purifier-chest. At the upper portion of the end plates *a* I place the first "step," so called, (marked *g*.) It is a wide one and extends across from one end plate to the other, its ends being set into the end plates. The middlings are first received upon this broad step, and during its agitation they slide down it, being impeded somewhat and thinned out by the pivoted impeder or flap *h*, which is weighted, as at *i*, and is pivoted at *j* to the end of the hopper *e*. Below this first step I arrange a series, more or less, as preferred, of narrower steps *k k k*, &c. They are slightly inclined forwardly instead of rearwardly, as the first step *g* is, and they extend across from one end plate *a* to the other and are attached to them in the same manner as it is. The steps *k k*, &c., are separated from each other vertically about half an inch, and the forward end of each lower one extends under the one above about half its width. These distances, however, are not at all arbitrary. They may be varied as required. The lowermost step projects beyond and overlaps the bolting-cloth or sieve sufficiently to insure the proper delivery of the middlings upon it.

The operation is as follows: The middlings are fed through the feed-spout and are gradually and in small quantities shaken off from the uppermost step *g*, being thinned and spread out by the retarder *h* until they drop over the lower edge of this first step upon the next step below, and from it in turn they are shaken from step to step, falling through space at each transfer. Meantime the fan generates a somewhat powerful air-blast, as set forth in my said former application, and the air from the two openings in the duct *G*, which are seen farthest at the left, passes upwardly through the space occupied by the steps, and it is confined measurably to that space by the partition *O*, so that the impurities contained in the middlings are caught by the air-blast as they fall from step to step and are carried upwardly above the sliding valve-board and enter the eyes of the fan, and are thence blown into the dust-collector without coming upon the bolting-cloth or sieve at all. The middlings, however, with some portion of the impurities fall from the lowermost step upon the bolting-cloths or sieve, and there the complete removal of the impurities is effected in a much more perfect manner than if all the impurities accompanied the middlings upon the sieve or bolting-cloth, because the action of the air through

them is much more effective since the choking action of the portion of the impurities which were removed during the passage of the middlings over the steps has been done away with. I have found that this combination and coactive operation of the devices is attended with remarkably perfect results, and I obtain a larger percentage of high grade middlings than is possible by the use of any apparatus heretofore known, as I believe—that is to say, by the use of this present improvement—I secure as a steady result and not as an occasional occurrence, the transfer of all the valuable stock now going to the two lower grades to the second grade, thus increasing largely the output of the second grade without depreciating it below the recognized standard for that grade in the trade.

The details of the operation of the dust collector and purifier and the beneficial results following the employment of the substantially air-tight connections between them have all been set forth fully in my said prior application, and I therefore will not repeat them here.

I do not limit myself to the details of construction. They may be considerably varied.

I claim—

1. The combination, in a purifier, of a feed-spout, a step over which the material drops on its way to the bolting-cloths, a partition which divides the portion of the purifier containing the steps from the part containing the major part of the sieve, a fan which forces air through the steps and through the bolting-cloth, an air-duct connecting the fan with a dust-collector separate from the purifier, and a return air-duct connecting the top of the dust-collector with the purifier below the sieve, the said purifier and dust-collector being substantially air-tight, substantially as set forth.

2. The combination of a series of steps and a sieve or bolting-cloth, both inclosed within a substantially air-tight purifier-chest, and partitions which divide the space in which the steps are located from that in which the sieve or bolting-cloth is located, and a fan connected with an air-tight dust-collector separate from and outside of the purifier-chest, and a return air-duct from the upper part of the dust-collector to the purifier below the sieve, substantially as set forth.

3. The combination of a series of steps and a sieve or bolting-cloth, both inclosed within a purifier-chest, and partitions which divide the space in which the steps are located from that in which the sieve or bolting-cloth is located, a fan which draws the impurities from both of said spaces, a conduit for the impurities connecting with the dust-collector separate from and outside of the purifier-chest, and a return-duct from the upper part of the dust-collector to the purifier below the sieve, substantially as set forth.

4. The combination, with a middlings-purifier having a substantially air-tight chest,

of a closed dust-collector, a fan and wind-trunk, a return-duct connecting the upper part of the dust-collector with the purifier below the bolting-cloths or sieves, a series of steps within the purifier, and a fan to circulate the air, and partitions which divide the interior of the purifier into two parts, in one of which the steps are and in the other the bolting-cloth or sieve, substantially as set forth.

5. The combination, with a middlings-purifier having a substantially air-tight chest, of a closed dust-collector, a fan and wind-trunk, a return-duct connecting the upper part of the dust-collector with the purifier below the bolting-cloths or sieves, a series of steps within the purifier, a fan to circulate the air, and partitions which divide the interior of the purifier into two parts, in one of which the steps are and in the other the bolting-cloth or sieve, and means whereby the steps and the sieve or bolting-cloth are simultaneously agitated, substantially as set forth.

6. The combination, with a middlings-purifier having a substantially air-tight chest, of a closed dust-collector, a fan and wind-

trunk, a return-duct connecting the upper part of the dust-collector with the purifier below the bolting-cloths or sieves, a series of steps within the purifier, and a fan to circulate the air, and a retarder which spreads and thins the material upon the first step, substantially as set forth.

7. The combination, with a middlings-purifier having a substantially air-tight chest, of a closed dust-collector, a fan and wind-trunk, a return-duct connecting the upper part of the dust-collector with the purifier below the bolting-cloths, said duct extending through the purifier substantially from end to end, partitions dividing the purifier into two spaces, steps in one of these spaces, a sieve or bolting-cloth in the other, and openings in said duct under the steps and sieve, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 27th day of May, A. D. 1891.

HENRY J. WOOLCOTT.

Witnesses:

PHILLIPS ABBOTT,
WALTER H. CRITTENDEN.