

W. & N. THAYER.
Middlings-Separators.

No. 215,491.

Patented May 20, 1879.

Fig. 1.

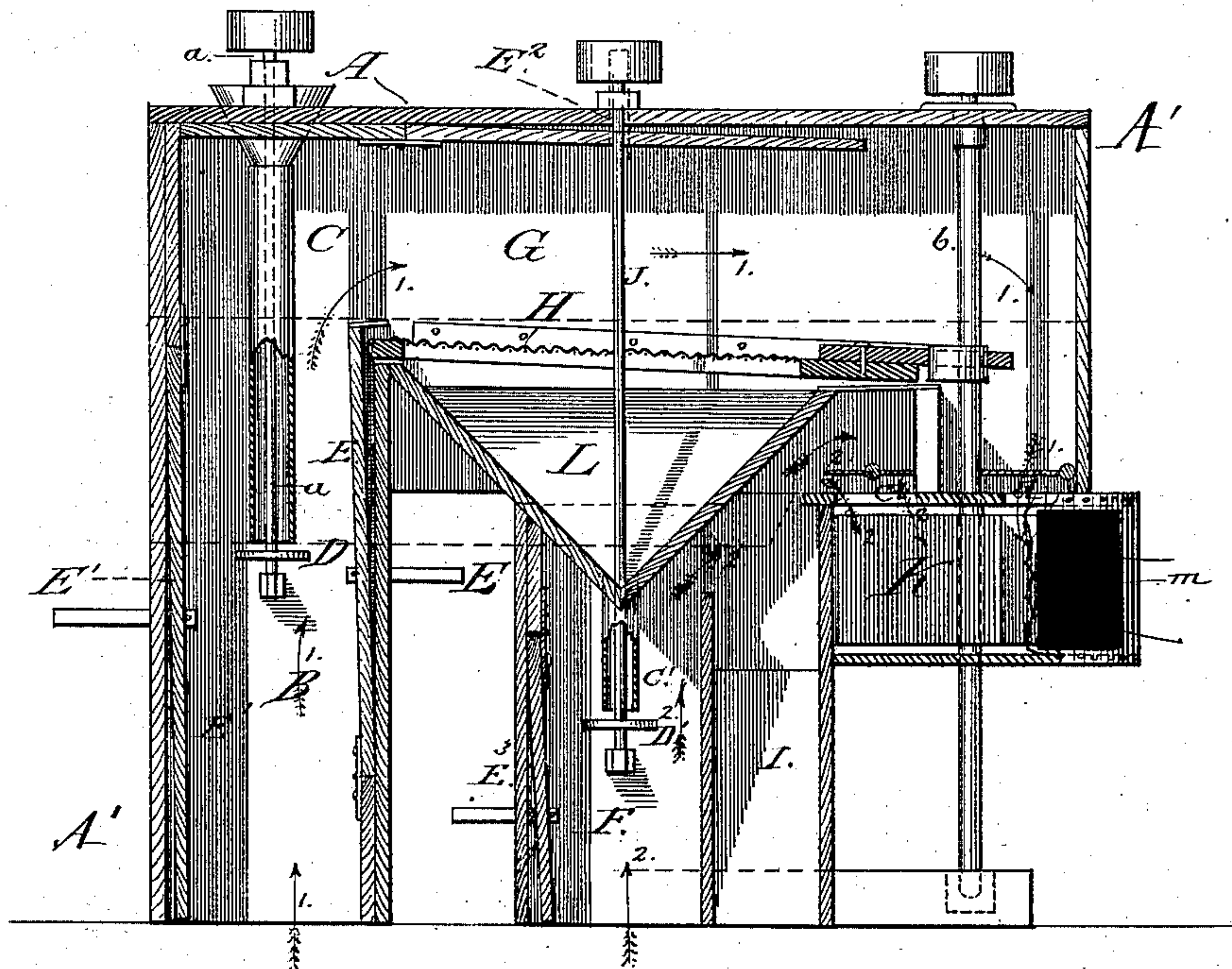
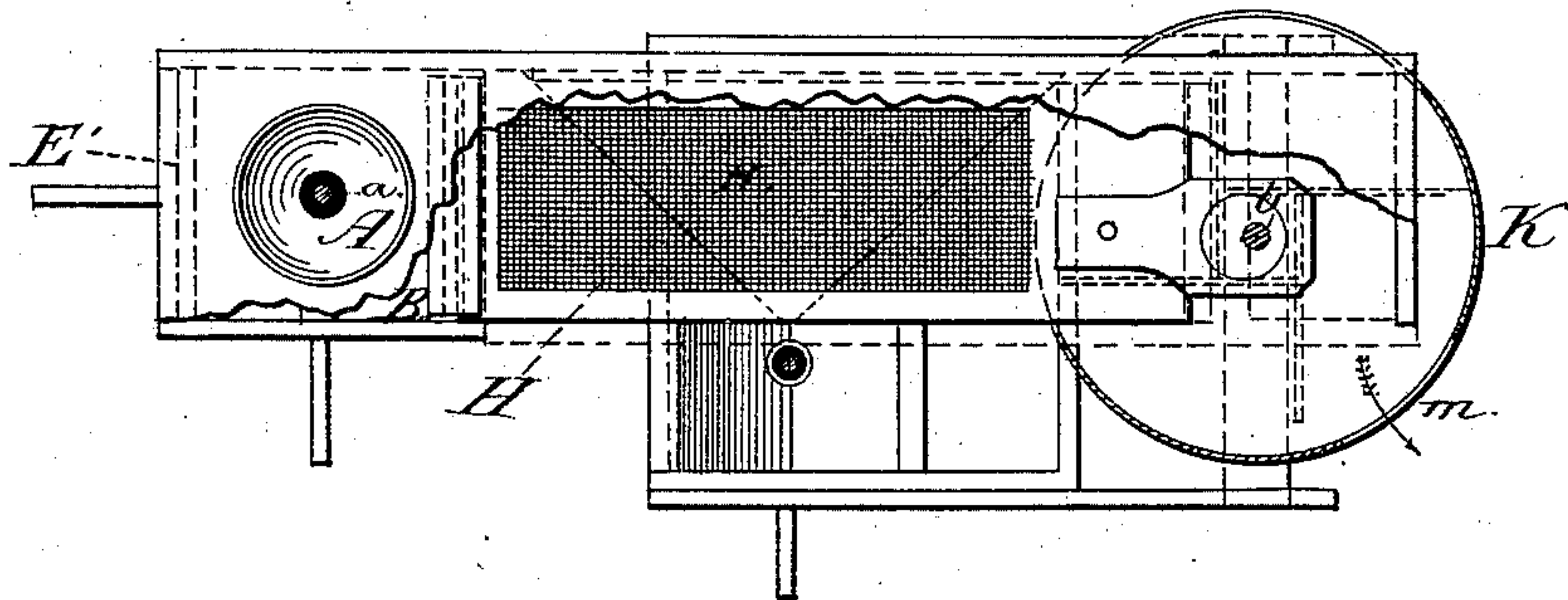


Fig. 2.



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IMPROVEMENT IN MIDDLEINGS-SEPARATORS.

Specification forming part of Letters Patent No. **215,491**, dated May 20, 1879; application filed July 18, 1878.

To all whom it may concern:

Be it known that we, WILLIAM THAYER and NEWTON THAYER, of Westerville, in the county of Franklin, in the State of Ohio, have invented a new and useful Improvement in the Process of Purifying Middlings, which process is fully set forth in the following specification.

Our invention is an improvement in middlings-purifiers; and has for its object to provide an arrangement for agitating the products of the mill, in which there is less than ordinary frictional and vibratory wear, by substituting certain novel devices for directing and controlling the air-blast induced by the fan or blower.

It consists in the arrangement, within a case, of a series of valves under the control of the operator, located at suitable points with reference to a sieve, and the blower provided with valves, which may be opened or closed to weaken or strengthen the draft at given points, and thus retard or quicken the movement of the middlings, as it may be necessary to throw out impurities or coarse stock while the middlings are circulating with the currents of air induced by the blower.

It consists, also, in providing, in connection with the sieve and the system of valves and air-trunks, a vacuum-chamber, into which will drop one grade of the valuable part of the middlings from its circuit.

In our drawings, Figure 1 is a sectional view of our machine. Fig. 2 is a plan view of same, with the case broken away to show some of the interior arrangements.

Similar reference-letters indicate like parts in all of the figures.

Referring to the drawings, A' is the case, rectangular in general form, provided at one end with a hopper, A, to receive the middlings to be purified. C is a tube extending from said hopper into the case, through which the middlings pass toward the box B. A shaft, *a*, hung in proper journal-bearings attached to the case, passes through the tube C, and has fixed upon its upper end a pulley, driven by a belt communicating with the applied power to move said shaft *a*, and with it a disk, D, which is intended to feed the middlings into the box B. At the opposite end of the case A' is located a blower, K, which is caused to

revolve by suitable gearing connected with a pulley fixed on the shaft *b*, which shaft forms the axis of said blower.

By the movement of the blower or fan K, currents of air are induced in the direction of the arrows 1 2 from the chamber F and box B—the one following the arrows 1 by way of the passage-way G, on through the blower, and out through the opening *m*, while that following arrows 2 moves over the vacuum-chamber I, through valve *c'*, and out through said opening *m*.

Chamber F, box B, and passage-way G are provided with valves E E¹ E² E³, properly hinged, which, under control of the attendant, are opened and closed to strengthen or weaken the blast at proper places in the currents, in order that the impurities may be drawn off, while the coarser are separated from the finer middlings.

In connection with the arrangement described, we provide a vacuum-chamber, I, which we locate at a suitable point with reference to the fan, into which the purified middlings of one grade drop on their passage in the current of arrows 2, from which they are conveyed.

In connection with the parts already described, we provide also an inclined sieve, H, which we locate on one side of a hopper, L, centrally fixed in the case. This sieve H is vibrated by an eccentric fixed on the shaft *b* as said shaft revolves about its axis.

Through hopper L passes a shaft, J, provided with a revolving disk, D', which is moved by suitable gearing connected with the applied power. Extending from the hopper L, and surrounding the shaft *e*, is a tube, which conveys the middlings which have passed through the sieve by way of disk D' into the chamber F, whence they are drawn again by the current ascending in the direction of arrows 2 and on the heavy particles dropping into chamber I, while the lighter pass out through valve *c* and opening *m* of the fan-drum.

To recapitulate and more fully illustrate the operation of our machine, we will suppose the middlings to be entering the hopper A, and passing through the spout C into the box B, while the blower is in operation simultaneously with the movement of the shafts *a* and

J. By reducing the space in the box B by adjusting the valves E E¹, the current is greatly strengthened, so that the entire mass received, excepting the heaviest middlings, which fall through the open bottom of air-box B, will be drawn rapidly upward, and thence, in the direction of the arrows 1, over the sieve. The valve E² regulating the current here, the second grade of middlings will drop onto the sieve, the heavier particles passing through it into the hopper L, while the coarse deleterious matter will pass over and be drawn off by the fan. The middlings coming through the sieve, gravitating downward through spout C', after passing the disk D', are met by the current moving in the direction of the arrows 2, are agitated, and the lighter drawn upward over the vacuum-chamber I, where the heavier particles of this portion drop, while the lighter pass through valve-opening c, and out through the opening m of the blower-drum.

By contracting the lower end of the air-box B, the strength of the current of air at the bottom will be increased sufficiently to hold the middlings suspended, to cause a thorough agitation and separation before being drawn off toward the passage-way G.

The openings in the upper part of the blower-drum are provided with valves c d, which may be adjusted independently of each other, to regulate the blast induced by the action of the blower-fan.

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

1. The box B, having valves E E¹, and provided with tube C and disk D, in combination with chamber G, provided with valve E², located above the plane of disk D, vibrating sieve H over hopper L, and blower K, all arranged as described, for the purpose set forth.

2. In combination with sieve H and hopper L, the chamber F, having valve E³, and provided with tube C' and disk D', vacuum-chamber I, having its mouth above the plane of disk D', and blower K, substantially as and for the purpose set forth.

3. The blower K, provided with independent valves c and d, to modify separately the currents coming over and under sieve H, as and for the purpose set forth.

4. In combination with blower K, the box B and chambers G and F, said blower-box and chambers being located as described, and provided, respectively, with valves to regulate air-currents in purifying middlings.

5. In a machine for purifying middlings, the blower K, chamber F, with valve E³, vacuum-chamber I, box B, provided with valves E¹ E, passage-way G, with valve E², and sieve H, all arranged substantially as and for the purpose set forth.

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Witnesses:

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