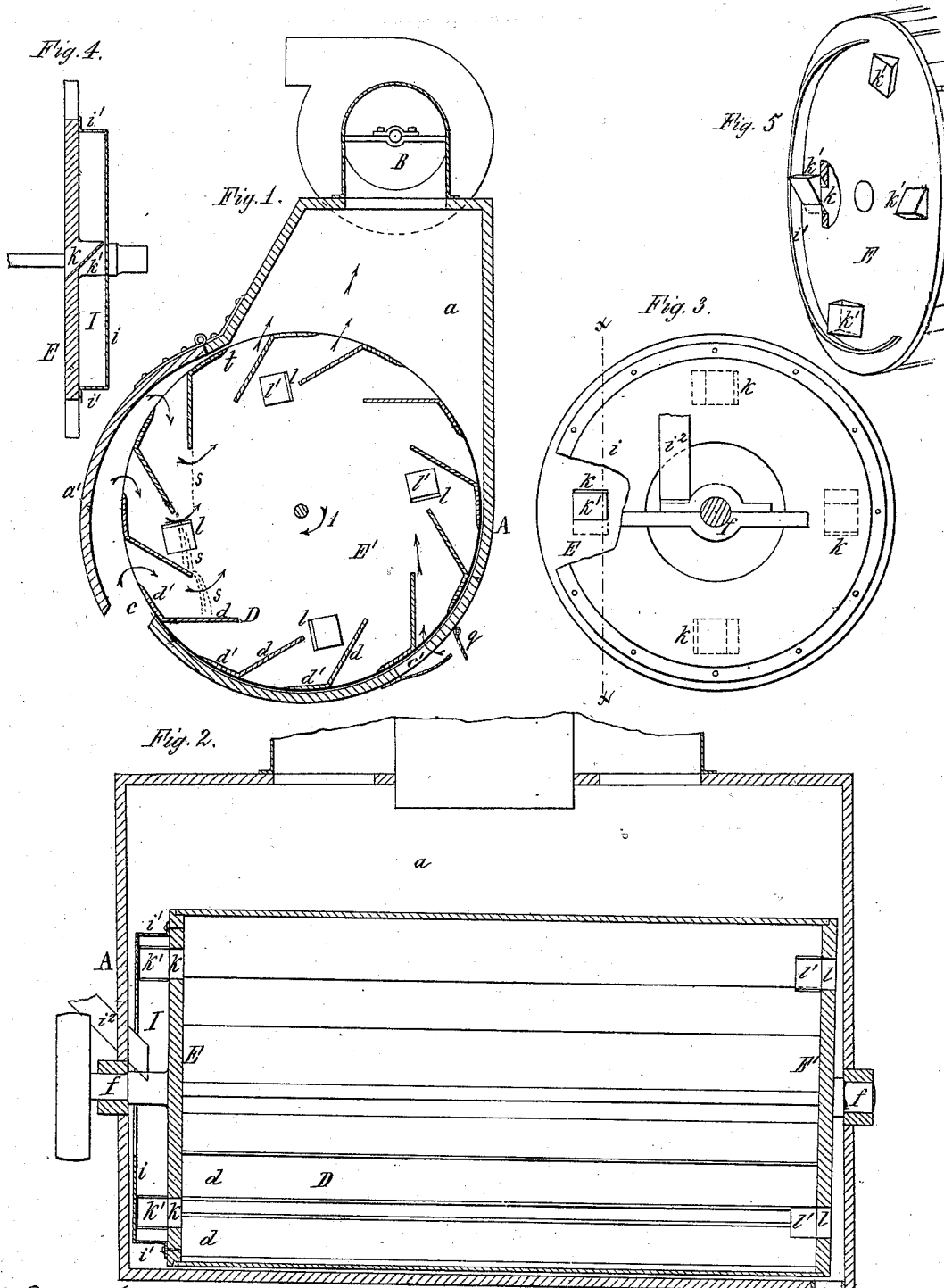


O. M. MORSE.
Middlings-Purifiers.

No. 149,507.

Patented April 7, 1874.



Edward Wilhelm
Jno. J. Bonnat
Witnesses

Orville M. Morse Inventor
by Jay Hyatt Atty.

UNITED STATES PATENT OFFICE

ORVILLE M. MORSE, OF OSWEGO, NEW YORK.

IMPROVEMENT IN MIDLINGS-PURIFIERS.

Specification forming part of Letters Patent No. 149,507, dated April 7, 1874; application filed February 13, 1874.

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, of the city and county of Oswego, in the State of New York, have invented certain Improvements in Middlings-Purifiers, of which the following is a specification:

My machine consists generally of a cylindrical case, provided with longitudinal air-inlets in the lower portion thereof, and constructed with an enlargement or extension at or near the top, which communicates with the eye of a fan, so as to induce an air-current upward through the case, and an elevating-wheel revolving within the case, composed of a series of longitudinal boards arranged around its periphery somewhat after the manner of the wings of a fan or the floats or buckets of a water-wheel. These wings or boards may be secured between two circular heads or disks provided with journals turning in suitable bearings in the ends of the case, or they may be attached to the ends of radial arms projecting from a horizontal shaft. These buckets or wings should be made curved in cross-section, or with a ledge or flange at the outer edge, so as to form buckets that will hold the material and prevent it from escaping over the outer edge as it is elevated. The case and elevating-wheel are arranged in a slightly-inclined position in the manner of an ordinary flour-bolt.

The general operation of my machine is as follows: The unpurified middlings are fed into the upper end of the case in any suitable manner, so as to fall upon the buckets which carry the material upward to a certain height, when it is discharged from the inner edge of the now inclined bucket, and falls downward upon the succeeding buckets, which, in turn, empty it upon the next, and so on, the material traveling spirally around and around in the machine until it finally reaches the tail of the machine, where it is allowed to escape. In the descent of the material, as it is repeatedly discharged in a thin sheet from the buckets, it passes through the air-current leading to the fan which separates the impurities and carries them upward to the fan, while the granules of middlings descend, the material being repeatedly subjected to this separating air-current until it reaches the tail of the machine,

by which time the middlings are divested of the impurities in a most thorough manner.

In the accompanying drawings, Figure 1 is a central vertical cross-section of my machine. Fig. 2 is a central longitudinal vertical section thereof. Fig. 3 is an end elevation of the upper head of feed end of the wheel. Fig. 4 is a segmental section thereof in line *x x*, Fig. 3; Fig. 5, a perspective view of the head of the wheel with a portion of the feeding-case broken away.

Like letters of reference designate like parts in each of the figures.

A is the case of the machine, and *a* the extension thereof; B, the suction or exhaust fan; and *c c'*, the air-inlet openings in the lower portion of the case. D is the elevating-wheel, and *d d'* the buckets or wings thereof. These buckets are shown attached at their ends to two heads or disks, E E', which are keyed to a shaft or provided with journals *f*, having bearings in the ends of the case. The wings or buckets are shown so constructed and arranged as to prevent the material, after it has been fed into the buckets, from falling between them into the bottom of the case as the wheel revolves, the material discharged from the inner edge of any bucket falling upon the succeeding buckets. The outer edges of the buckets are shown provided with a flange, *d'*, which prevents the material on the buckets from being discharged or sliding off of the outer edge of the buckets as the wheel revolves and changes the position and inclination of the buckets. The head E is shown provided on its outer side with a projecting feed-chamber, I, formed by a disk, *i*, and circular flange *i'*, secured to the head with a central opening in the disk for the feed-spout *i''*. The head E has openings, *k*, arranged near or between the buckets of the wheel, and provided with inclined boards or buckets *k'* extending from the head through the feeding-chamber to the outer disk *i* thereof, and slanting inwardly, so as to form an acute angle with the direction of the movement of the wheel, so that as the wheel revolves said scoops will take the material from the bottom of the feed-chamber and raise the same on the elevating side of the wheel until they have assumed an inclination which will cause the material scooped up to

be discharged through the opening *k* onto the buckets of the wheel. The head *E'* at the tail end is provided with holes *l*, made at the junction of several of the buckets with the head, and a suitable space is left between the latter and the outer case, so that the purified middlings escape into the bottom of the case, and thence into a spout, *m*, leading therefrom. If desired, the openings *l* may be provided with outwardly-inclined scoops or boards *l'*, arranged on the inner side of the head *E*. The material may, however, be fed into the machine and on the buckets through a spout, and discharged therefrom in the same manner as meal is fed into an ordinary flour-bolt and the refuse discharged. The air is let in at two points at the right and left side of the bottom of the case through openings *c c'*. The opening *c* at the left side is formed by hinging a segment, *a'*, of the case, as shown, the lower edge of which can be adjusted out and in, so as to leave any desired width of inlet for the air. The opening *c'* consists of a longitudinal slot, the size of which is regulated by an adjustable hinged flap, *g*. The wheels revolve in the direction indicated by the central arrow 1. The middlings discharged through the openings *k* onto the buckets, as before described, are carried upward by the buckets as they rise, and as the buckets change their inclination the material begins to slide therefrom, as indicated at *s*, in Fig. 1, when it is subjected to the action of the upward air-current which carries the impurities to the fan, while the heavier particles or middlings de-

scend and fall onto the succeeding bucket, as hereinbefore described. The opening *c'* is designed to admit a sufficient amount of air to prevent the formation of any eddy on the descending side of the wheel, and to carry upward any impurities which may have fallen out of the main air-current. The flanges *d'* of the buckets should snugly fit the case at the point *t*, where it may be lined with sheepskin or other material to insure a tight fit and prevent the passage of the air outside of the buckets to the fan.

By dispensing with the use of wire-cloth as employed in reel-bolts, I am enabled to construct my machine at a comparatively small cost, while the air which freely enters at the required points, and thence passes directly across the case, and through the material as it successively falls from one bucket to the other acts without obstruction and with the greatest efficiency in separating and removing the impurities.

What I claim as my invention is—

The combination, with the case *A*, communicating at its top with the eye of a fan, of an elevating-wheel composed of extended open buckets *d*, which successively elevate the material and discharge the same from one bucket to the other, whereby the material is repeatedly subjected to the separating action of the air-current, substantially as hereinbefore set forth.

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