

R. L. DOWNTON.

MACHINE FOR CRUSHING AND PURIFYING MIDDINGS.

No. 177,062.

Patented May 9, 1876.

Fig. 1.

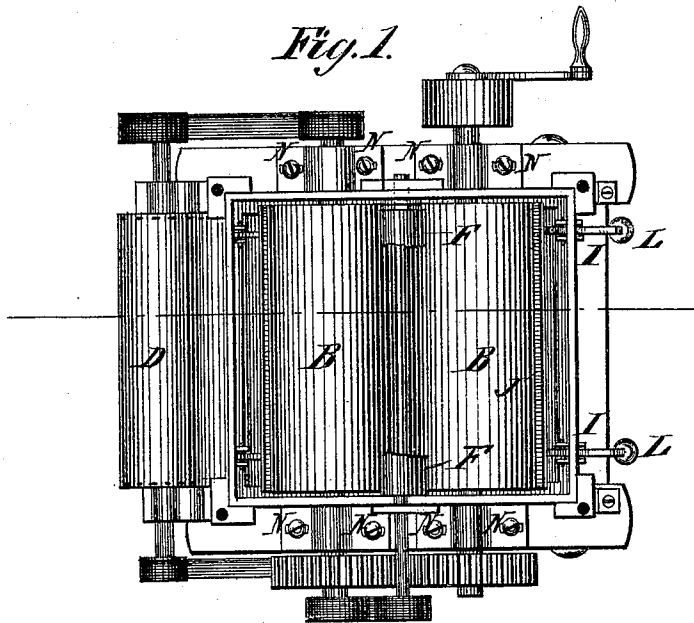
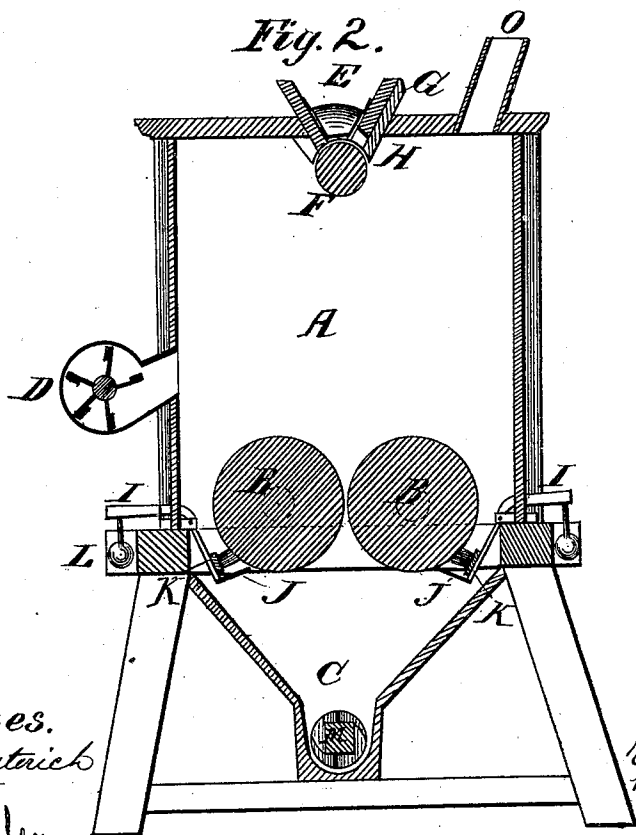


Fig. 2.



Witnesses.  
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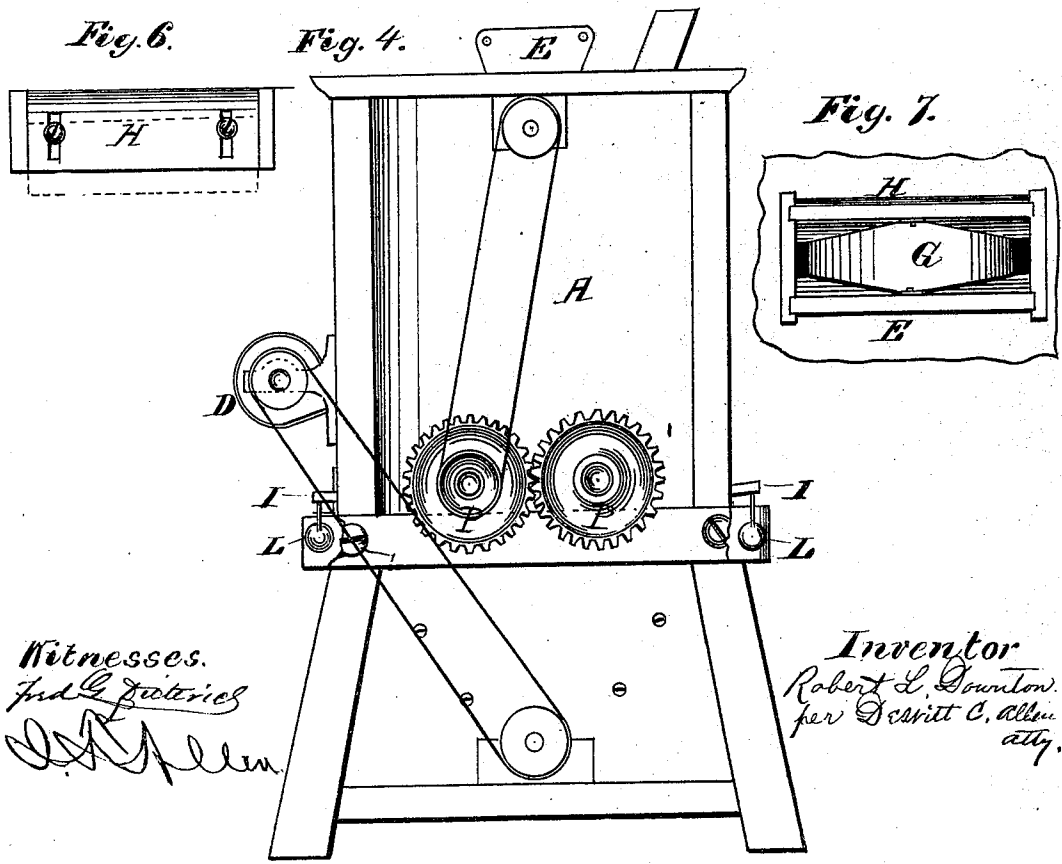
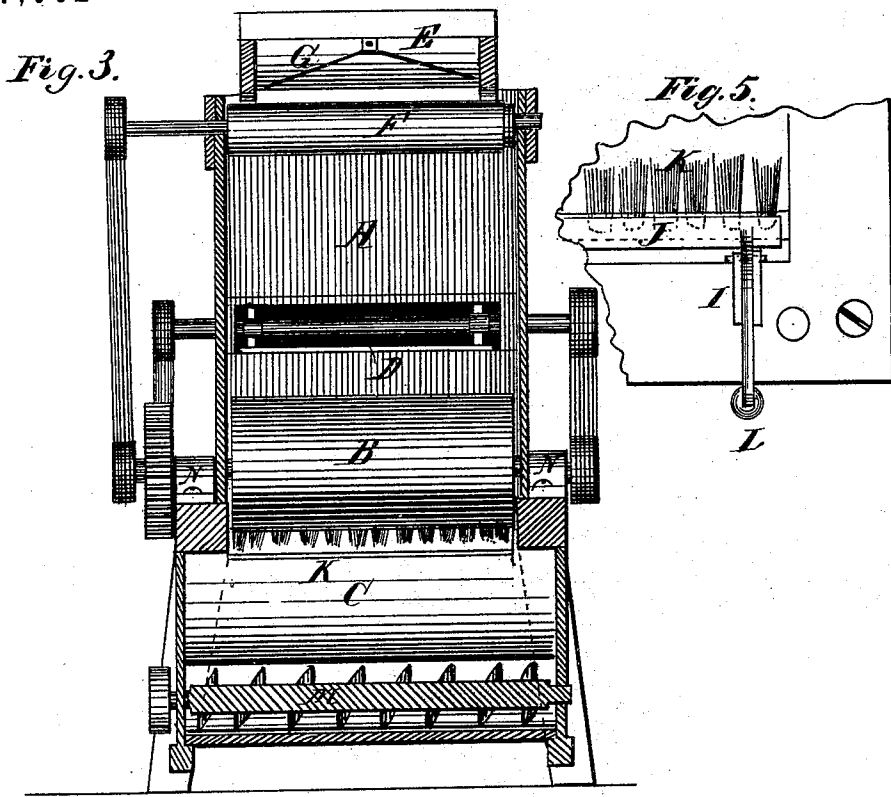
Inventor  
Robert L. Downton  
per Fessitt C. Allen  
att'y.

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Witnesses.  
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# UNITED STATES PATENT OFFICE.

ROBERT L. DOWNTON, OF MILWAUKEE, WISCONSIN.

## IMPROVEMENT IN MACHINES FOR CRUSHING AND PURIFYING MIDLINGS.

Specification forming part of Letters Patent No. **177,062**, dated May 9, 1876; application filed March 7, 1876.

*To all whom it may concern:*

Be it known that I, ROBERT L. DOWNTON, of the city and county of Milwaukee, State of Wisconsin, have invented certain new and useful Improvements in Machines for Purifying and Crushing Middlings, Flour, Grain, and other granular substances, of which improvements the following is a full, clear, and exact description, reference being made to the accompanying drawings forming a part of this specification, and in which—

Figure 1 is a top or plan view of the crushing-rolls, the chamber inclosing them being broken away. Fig. 2 is a longitudinal section; Fig. 3, a transverse section; Fig. 4, a side view; Figs. 5, 6, and 7, detail views.

Like letters of reference indicate like parts.

The object of my invention is to both purify and crush middlings, flour, grain, or other granular substances, by the arrangement of devices in one organized machine; and it relates more particularly to purifying and crushing middlings, and is intended as an improvement upon certain portions of the machinery necessary in carrying out the process for manufacturing middlings-flour, patented by me April 20, 1875, and No 162,157.

The invention consists in the combination of a chamber, wherein the middlings are subjected to the action of air currents for removing the fuzz, bran, and other light impurities, and crushing-rolls arranged therein, through which the middlings are subsequently passed, the air-currents also keeping the crushing-rolls cool. It also consists in combining with the crushing-rolls, scrapers, and brushes for removing from them any material adhering thereto, with devices for keeping an even pressure of the scrapers and brushes on the crushing-rolls. It finally consists in combining with the supply-hopper a double-inclined and double-tapering board, arranged therein for distributing or spreading the material evenly to the feeding device, all as hereinafter more fully described.

In the drawing, A represents a rectangular chamber, supported and secured on top of the inclined hopper C in any suitable manner. B B are two crushing-rolls, arranged within the chamber A and supported in adjustable bearings N, secured on the top edges of the sides

of the hopper C, as clearly shown in Figs. 1 and 3, whereby the crushing-rolls can be set to crush finer or coarser, as desired. The crushing-rolls, in the present instance, are composed of chilled iron; but any other suitable material may be used, such as steel, marble, or porcelain. The adhering of the middlings to the crushing-rolls is prevented by the scrapers J and brushes K, placed transversely of the rolls and bearing against the under surfaces. (See Fig. 2.) The scrapers and brushes are secured to the inner ends of pivoted arms I, which are provided on their outer ends with weights L, for the purpose of keeping an even pressure of the scrapers and brushes on the rolls.

The brushes K can be made of any suitable and pliable material.

F is a feed-roll, journaled in the upper portion of the chamber A and immediately under the supply-hopper E, arranged on top of said chamber. H is an adjustable feed-board for determining the width of the opening through which the material passes from the hopper, and hence regulating the quantity as desired. Arranged within the supply-hopper E is a double-inclined and double tapering board, G, for distributing and spreading the material therein evenly over both sides of the double-tapering board to the feed-roll. D is a blast-fan for creating a current of air through the middlings discharged into the chamber A, for removing the fuzz, bran, and other light impurities mixed therewith, which would injure and deteriorate the quality of the flour if allowed to pass through the crushing-rolls with the middlings. The air-current also serves to keep the rolls cool. The middlings passing through the crushing-rolls fall into the inclined hopper, and are carried and discharged through one end thereof by a conveyer, M. Motion is applied to one of the rolls by any suitable motor power, which in turn communicates motion to the other roll by gear-wheels P P, the fan, feed-roll, and conveyer receiving motion through the medium of the crushing-rolls by means of belts and pulleys, as clearly shown in the drawing.

Instead of using weights on the ends of the pivoted arms of the scrapers and brushes springs may be substituted therefor, and the

crushing-rolls can be held together by means of screws, springs, or weighted levers, as desired.

I do not wish to confine myself to a blast-fan for creating a current of air through the chamber A, as a suction-fan will accomplish the same object by merely placing it over the spout O, and providing the chamber with openings above the crushing-rolls for the admission of air.

The operation of my improved machine may be described as follows: The machine being set in motion, the middlings to be purified and crushed are fed through the supply-hopper into the chamber A, where they are subjected to the air-currents produced by the fan D, which separates and carries off the fuzz, light bran, and other impurities through the spout O, while the middlings pass down and through the crushing-rolls, and are comminuted into finer middlings or flour, and the germ or heavy bran being of a plastic nature is flattened out, so as to be easily separated from the middlings or flour by means of a reel-bolt or shaker, as clearly set forth in my process patent hereinbefore referred to.

By means of the within-described machine the coarser middlings can be spouted directly

from the separating-bolt to the crushing-rolls, but it is more preferable to subject them to as many purifications as possible before passing them to the crushing-rolls.

I claim as my invention—

1. The combination of a chamber, in which the middlings, or other granular substances, are subjected to the action of air-currents and crushing-rolls arranged therein, substantially as and for the purpose set forth.

2. The combination, with the crushing-rolls B B, of the scrapers J and brushes K, substantially as and for the purpose specified.

3. The combination, with the crushing-rolls B B, of the pivoted and self-adjusting scrapers and brushes J K, as and for the purpose herein shown and described.

4. The combination, with the hopper E, of the double-inclined and double-tapering board G arranged therein, whereby the material is distributed over both sides of the double-tapering board, substantially as herein shown and described.

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Witnesses:

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