R. L. DOWNTON.

Process of Manufacturing Middlings Flour.

No. 162,157. Patented April 20, 1875.

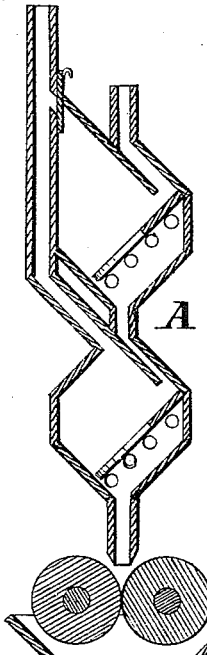


FIG. 1.

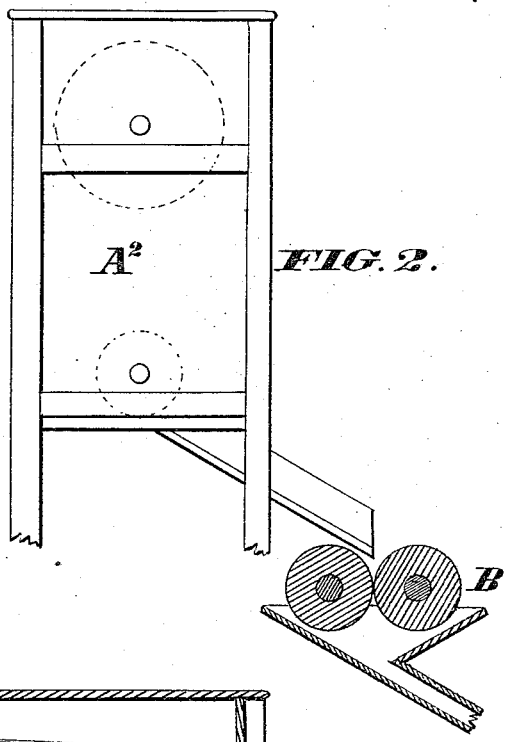
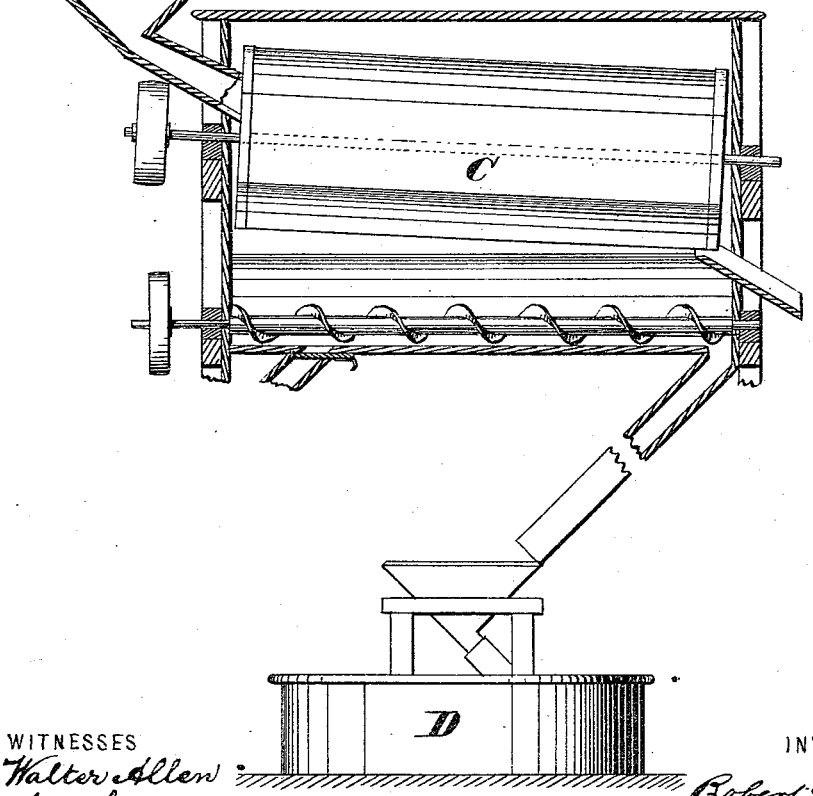


FIG. 2.



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ROBERT L. DOWNTON, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN PROCESSES OF MANUFACTURING MIDDLINGS-FLOUR.

Specification forming part of Letters Patent No. **162,157**, dated April 20, 1875; application filed March 29, 1875.

To all whom it may concern:

Be it known that I, ROBERT L. DOWNTON, of the city and county of St. Louis, in the State of Missouri, have invented a new and useful Improvement in the Process of Manufacturing Middlings-Flour, of which the following is a specification:

This invention has for its aim the better working or manipulating of grain particles known as middlings for their reduction into meal or flour.

To fully set forth the advantages that this process possesses over any of the various processes previously known and in use, it will be necessary to briefly describe the manufacture as now practiced.

It is customary under the ordinary mode of milling to separate and purify the middlings by the action of air alone, or air and bolting-cloth combined; then to convey the purified product to millstones to be ground to a sufficient fineness to admit of the passage of the middlings-flour through the meshes of the bolting-cloth, which is used as a finishing-preparer between the stones and the flour barrels or sacks receiving the finished product. In some cases the middlings that are not sufficiently reduced to go through the meshes of the cloth pass through the ends of the flour-bolts, and are brought back onto some of the various purifiers and subjected to repurification. This process requires much careful manipulation, and even then the yellow germ and pellicle of the grain will be so torn and pulverized by the stones that loose portions of the same will pass through the meshes of the bolting-cloth into the flour with injurious effect. The reason why the germ and pellicle is so torn is, that millstones are composed of two disks—one revolving, the other stationary—receiving the material to be ground at the eye or center of the stones, and compelling it by centrifugal force to escape at the skirt or periphery of the stones, passing alternately over face and furrow until it reaches the periphery, where it is discharged. Such action comminutes the germs and forms specks that cannot be removed by the purifiers, and are therefore ground in with the flour.

In the manufacture of middlings-flour the action of stones on the middlings is not different from their action on grain, but in the wheat-stones the germ ends and bran are not sufficiently comminuted by one grinding to pass through the meshes of the cloth used for the flour known to the trade as "first run." I purpose to arrest and remove such germ matter and bran particles by my improved process before they reach the second grind on the middlings-stones by placing between the purifiers or separators and middlings-stones one or more sets of rolls, which will operate to reduce the large middlings by a bruising or crushing action, while they simply flatten out the intermixed germs and bran. Any of the various purifiers or separators in public use may be employed. A second important advantage or result of this improved process is the production of a large yield of high-grade flour. The large middlings or glutinous particles of the grain require more grinding than do the finer and more starchy particles removed at the head or first part of the purifiers; and when ground together, as is generally the case with small mills, and frequently the case with large mills, the meal is considerably heated in the grinding, owing to the miller's requiring the middlings-meal to be of uniform fineness. The disposition and fineness of the small middlings cause them to "flour" quicker than the large middlings, therefore the grinding is unequal, as, in order for the large glutinous middlings to be ground enough, the small starch middlings must be ground too much. This impairs the quality of the flour by deadening it as well as by reducing the germs and bran to such an extent as to cause them to pass through the cloth. Some mills, therefore, run the coarsest middlings to a lower grade of flour.

It is plain that, with an intermediate reduction, by the flattening-rolls working on the large middlings, as above set forth, the comminution of the middlings under the stones is rendered more equal and a larger percentage of high-grade flour can be made.

I will now describe briefly my mode of milling, referring, for illustrations, to the accompanying drawing, in which—

Figure 1 is a general side view, partly in section, showing an apparatus or a series of machines comprising a section of my purifier

A; and Fig. 2 is a like view of the same apparatus, in part, illustrating the employment of any other purifier A^2.

Naturally the germs and bran are kept with the large and valuable middlings or particles of grain by the bolting-cloth of the purifying-machines or flour-bolts till they reach certain parts, where the middlings are subjected to strong currents of air to remove light bran-flakes and fuzzy matter. The partially-freed middlings are now passed from the purifier A or A^2 between rolls or uniformly-rotating surfaces B, where the good middlings particles, being more brittle, are reduced to small granules or to flour, while the germ and heavy bran matter, being of a soft plastic nature, is flattened out, so that, on passing it into a reciprocating or revolving bolt, C, clothed with suitable cloth, the flouring matter is thoroughly removed through the meshes of the cloth in a fit state of purity to pass to the stones D to be reground, as usual, and the injurious germs and refuse matter are arrested, so as to be run off into suitable receptacles.

The following is claimed as new, namely:

The herein-described process of manufacturing middlings-flour by passing the middlings, after their discharge from a purifier, through or between rolls, and subsequently bolting and grinding the same, for the purposes set forth.

ROBERT L. DOWNTON.

Witnesses:
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1,250 words.