

(No Model.)

N. NIELSEN.
MIDDLINGS PURIFIER.

No. 263,564.

Patented Aug. 29, 1882.

Fig. 1.

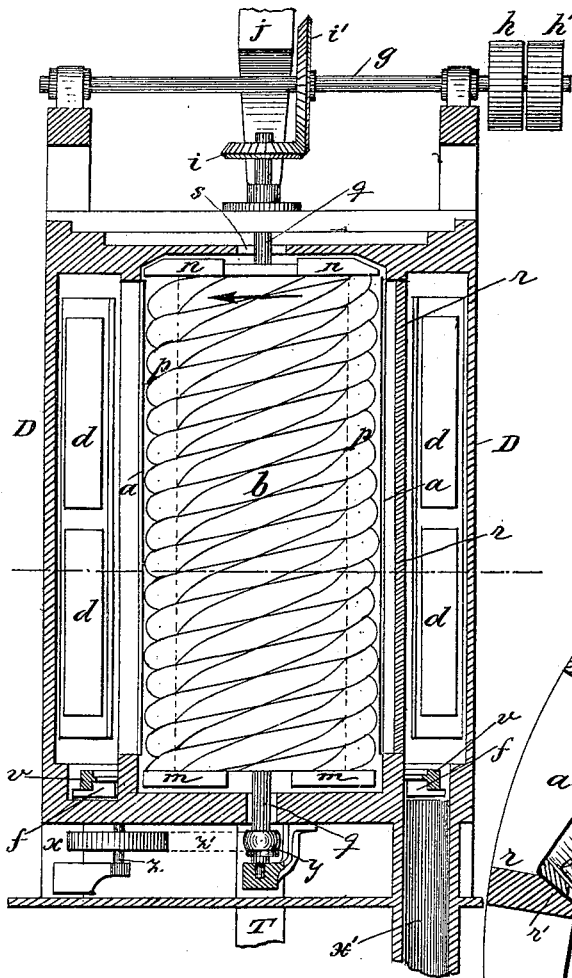


Fig. 2.

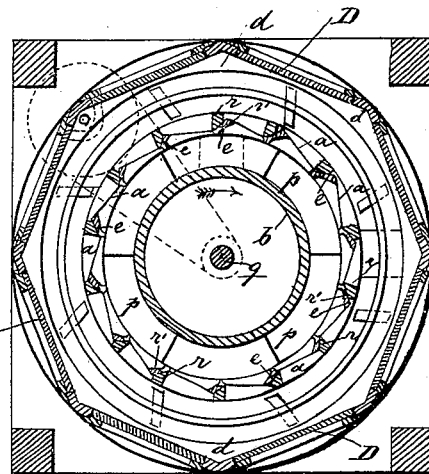


Fig. 3.

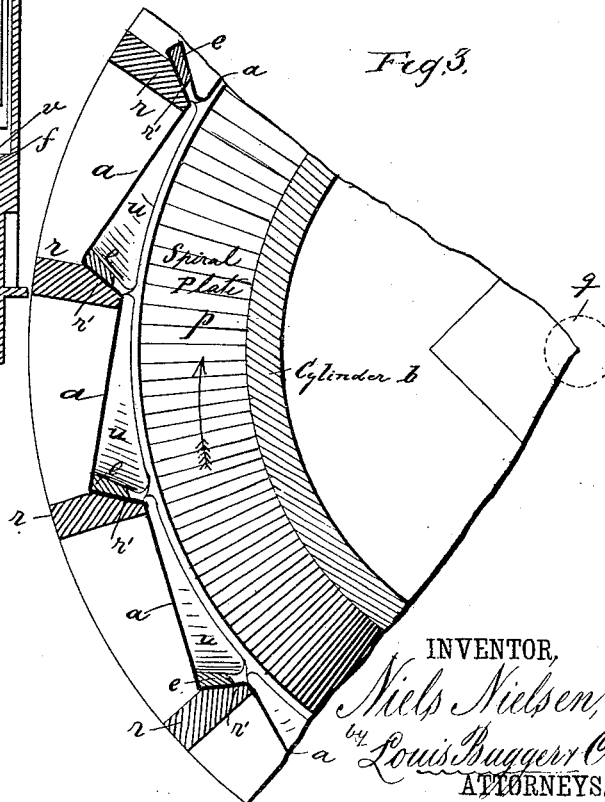
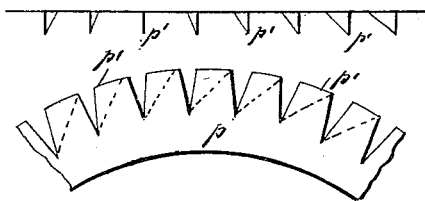


Fig. 4.



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MIDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 263,564, dated August 29, 1882.

Application filed June 21, 1882. (No model.) Patented in Germany February 10, 1881, No. 15,815; in Sweden March 23, 1881; in Denmark April 16, 1881, and in Norway August 23, 1881.

To all whom it may concern:

Be it known that I, NIELS NIELSEN, a subject of His Majesty, the King of Denmark, residing at the city of Copenhagen, in the Kingdom of Denmark, have invented certain new and useful Improvements in Middlings-Purifiers; and I do declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has relation to vertical middlings-purifiers or flour bolts; and it consists in the detailed construction and combination of parts of the same, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 is a vertical sectional view of my improved middlings-purifier. Fig. 2 is a cross-section of the same. Fig. 3 is a sectional detail view, on an enlarged scale, of a portion of the stationary bolt and its rotary beater; and Fig. 4 is a detail view, representing a modification in the construction of the rotary beater.

The same letters of reference indicate the same or corresponding parts in all the figures.

My improved middlings-purifier consists essentially of three parts—viz., an outer casing or envelope, which receives the bolted flour, a gauze-covered stationary bolt arranged vertically within the outer casing, and a rotary cylindrical beater having a circumferential spiral flange extending from top to bottom, which is mounted upon a vertical axis within the stationary bolt.

The letter D represents the casing, which in the present instance is octagonal in shape; but it may be made square, hexagonal, or cylindrical, if desired. Placed centrally within this casing is the bolt or sifter, which is constructed as follows: Arranged in a circle equal distances apart are posts or uprights *r*, the inner edges of which are beveled on one side, as shown at *r'* in Fig. 3. The bolting-cloth (designated by the letter *a*) is clamped or held between the beveled edges of the posts *r* and

narrow strips or cleats *e*, and it follows that the bolt is not of cylindrical shape, but that it presents in cross-section a serrated rim or edge formed by the vertical planes of the bolting-cloth between the posts or uprights *r*. These planes are tangential to the rotary beater *b*, or, rather, to its spiral flange *p*, which rotates in the direction of the tangential point, as indicated by the arrows in Figs. 2 and 3. The spiral flange *p* is preferably of sheet-metal plates, and surrounds the cylindrical core *b* of the beater from top to bottom, as shown in Fig. 1. This beater is rotated by a vertical shaft, *q*, by means of intermeshing bevel-wheels *i i'*, a drive-shaft, *g*, and a pulley, *h*, the letter *h'* indicating the loose pulley on the end of the drive-shaft. The cylinder, with its spiral, is rotated by this mechanism against the direction of the threads or windings of the spiral. Hence in the case of a left handed spiral, as in the drawings, the cylinder should rotate from left to right.

Secured radially upon the top of the revolving cylinder are two or more wings or vertical flanges, *n*, and to its bottom are secured similar wings or scrapers, *m*. In the triangular spaces formed by the planes *a* and fastening strips or cleats *e* are fixed in an inclined position endwise triangular shelves or plates *u*, of sheet-iron, having rounded corners, the function of which will be set forth in describing the operation of the machine.

In the bottom of the casing *d*, concentric with the beater *b p*, is arranged a wheel, *v*, to the under side of which are affixed equidistant scrapers *f*, which bear against the bottom of the casing or flour-receptacle. Wheel *v* has an internal gear, which meshes with a pinion (shown in dotted lines in Fig. 2) at the upper end of a shaft, *z*, which is rotated by a pulley, *x*, endless band *z'*, and pulley *y*, keyed upon the lower end of shaft *g*.

The operation of the machine is as follows: The meal or chop is fed into the stationary bolt from the top through the chute or funnel *j*, and is, by the centrifugal action of the beater *b*, thrown against the tangential gauze sides *a* of the stationary bolt. A part of the flour passes through the bolt into the surrounding

casing *d* and falls to the bottom thereof. The rest of the meal or chop falls back upon the spiral plates *p*, and is by them again thrown against the tangential sides of the bolt. The inclined plates *u*, projecting from the latter like steps or shelves, will prevent a too rapid descent of the meal from the top to the bottom of the bolt, breaking its passage through it, so that a given quantity of meal is repeatedly thrown by the spiral flange *p* against the sides of the bolt with considerable force before it reaches the bottom. In this manner all the flour is gradually sifted from the meal and received, on the other side of the bolt, in the space *d*, between the outer casing, *D*, and the stationary bolt.

The wings *n* on top of the beater serve the double purpose of throwing the meal as it is fed to the machine out against the sides of the bolt and into the spiral flange *p*, and of sucking air into the machine through the aperture *s* on top. As the bran and coarse parts reach the bottom, after this repeated hopping between the beater and bolting-cloth, they are conducted by the rotary scrapers *m* into the discharge-chute *T*. The bolted flour is in like manner scraped off the bottom of the casing or chamber *D* and conveyed to the flour discharge or outlet *x'*. To still further retard the passage of the meal through the bolt from top to bottom, the spiral flange *p* has its outer edge notched or serrated, as shown in Fig. 4 of the drawings, and the corners bent up to form saw-teeth-like projections *p'*, which operate as wings or fans to throw the meal with increased force against the tangential planes *a* of the bolting-cloth.

The advantages of my improved middlings-purifier are: a thorough and effectual sifting of the meal or chop, avoiding loss or waste of fine flour, greater speed in the bolting of a given quantity of meal than with the machines now in use with which I am acquainted, and less wear of the bolting-cloth.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a middlings-purifier, the combination, with the rotary beater *b p*, of the stationary bolt, consisting of the uprights *r*, having beveled sides *r'*, cleats *e*, and bolting-cloth *a*, whereby a series of vertical planes of bolting-cloth are formed tangential to the rotary beater *b p*, substantially as set forth.

2. In a middlings-purifier, the stationary bolt *a*, constructed as described, and the inclined triangular shelves or plates *u*, in combination with the rotary beater, consisting of the vertical cylinder *b* and spiral plates *p*, substantially as set forth.

3. In a middlings-purifier, the combination, with the stationary bolt, of the vertical rotary beater, consisting of a cylindrical case or body, *b*, and spiral plates *p*, the edges of which are notched and set up to form saw-teeth-like projections *p'*, substantially as set forth.

4. In a middlings-purifier, the combination of the casing or flour-receptacle *D*, constructed with discharge-chute *T*, stationary bolt *a*, constructed with gauze or bolting-cloth, equidistant uprights *r*, clamping-cleats *e*, and inclined triangular shelves *u*, the vertical rotary beater, constructed with the cylindrical case or body *b*, top wings, *n n*, bottom-scrapers *m m*, and spiral plates or flange *p*, and mechanism for rotating the beater-cylinder in the direction against the thread of its spiral flange, all constructed and combined substantially as and for the purpose herein shown and described.

In testimony whereof I have hereto affixed my signature in presence of two witnesses.

NIELS NIELSEN.

Witnesses:

JOH. HERONE.

ED. VENNEHUS.