A. TONNAR.

Grain Drier.

No. 56,868. Patented July 31, 1866.

Fig. 2

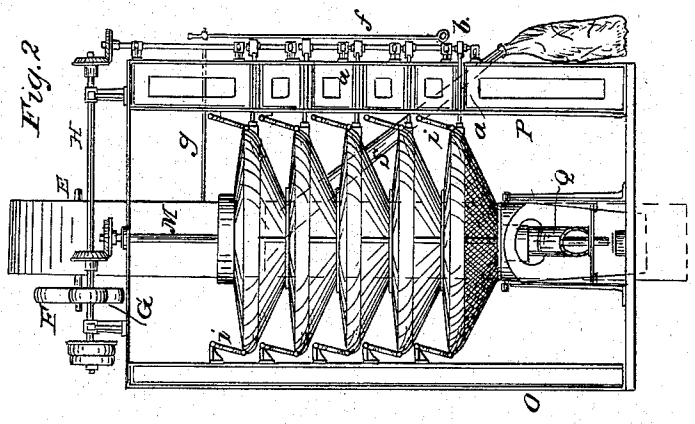


Fig. 1

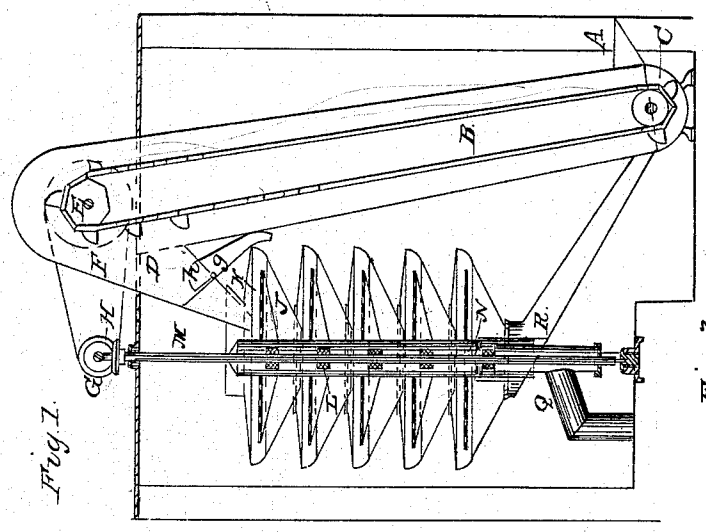


Fig. 4

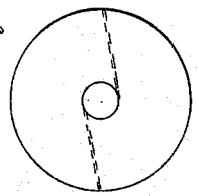
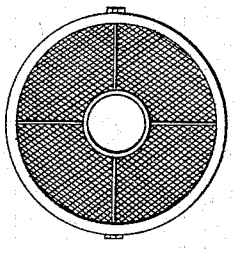


Fig. 3



Witnesses

Chas. H. Smith

Geo. L. Walker

Inventor

August Tonnar

per L. W. Serrell Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

AUGUST TONNAR, OF EUPEN, PRUSSIA, ASSIGNOR TO SIGISMOND DREY AND MORITZ ROSENHEIM, OF NEW YORK, N. Y.

MACHINE FOR DRYING AND CLEANING GRAIN, &c.

Specification forming part of Letters Patent No. **56,868**, dated July 31, 1866.

To all whom it may concern:

Be it known that I, AUGUST TONNAR, of Eupen, in the Kingdom of Prussia, have invented, made, and applied to use a certain new and useful Improvement in Machinery for Drying and Cleaning Malt and Grain; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a vertical section of my improved machine. Fig. 2 is an elevation of the same. Fig. 3 is a sectional plan of one of the conical agitators; and Fig. 4 is a plan of one of the centrifugal disks.

Similar marks of reference denote the same parts.

The object of my invention is to dry malt or grain with rapidity, and at the same time clean it, and, especially with malt, to break off and remove the sprouts or radicles, and subject said malt to whatever degree of heat may be required.

My machine consists in a series of centrifugal disks revolving with and upon a hollow hot-air pipe, in combination with a series of conical sieves or perforated agitators that receive the grain or malt from the edge of one of the revolving disks and deliver it near the center of the next centrifugal disk, said conical agitators being formed with closed covers, upon which the sprouts or dirt falls and passes off at the edges, and said conical agitators are suspended and receive a vibratory motion from a series of cams or eccentrics.

In the drawings, A is a hopper for receiving the grain or malt; B, an elevator belt or chain of any usual construction. C is the elevator-case at the bottom; and E the shaft for operating the elevator by the pulleys F and G and shaft H, driven by competent power.

M is a vertical shaft geared to the shaft H, and having cross-bars N, supporting the hot-air tube L, and K are centrifugal disks surrounding said tube L; and *e* are openings for hot air to pass out from the tube L below the disks K.

The hot air is supplied from an open coke fire through the stationary tube Q, or in any other desired manner.

Around the disks K are the conical agitators J, suspended from the columns O and P by means of links *i*, and each of these agitators is made with a closed sloping upper portion and a perforated conical under portion, said perforations being formed by a foraminous plate or by a wire screen or sieve.

The agitators J are vibrated by the rods *a*, acted upon by cams or eccentrics *b* upon the shaft *f*.

The operation of this apparatus is as follows: The malt or grain is elevated from the case C into the hopper D, and falls upon the upper plate, K, and by the centrifugal force is thrown off into the conical agitator J, and so on, passes from one to the other, (I have shown five,) and is delivered by the chute R, and returned to the elevator B.

The heated air dries the malt or grain thoroughly, and, by the repeated operations, to whatever extent may be desired, and the agitation breaks off the sprouts or radicles, and these pass through the perforations in J, falling upon the inclined covers of the agitators below, and, shaking off these, are gathered up at the bottom of the kiln.

A door in the chute R is provided, so that the grain or malt can be inspected, and when properly dry a valve, *h*, in the hopper D is moved by the rod *g*, which causes the grain or malt to be conveyed away by the chute S to a bag or other receptacle.

This apparatus may be inclosed in any suitable casing, so as to retain the heated air, and a ventilator is to be provided near the upper part to allow the escape of vapors.

What I claim, and desire to secure by Letters Patent, is—

1. The conical perforated agitators J, constructed substantially as specified, in combination with the centrifugal disks K and hot-air pipe L, for the purposes and as specified.

2. The arrangement of the chute S and valve *h*, in combination with the chute D and conical agitators, for the purposes and as set forth.

In witness whereof I have hereunto set my signature this 26th day of March, A. D. 1866.

A. TONNAR.

Witnesses:
W. W. VESEY,
HERM. DAHMEN.