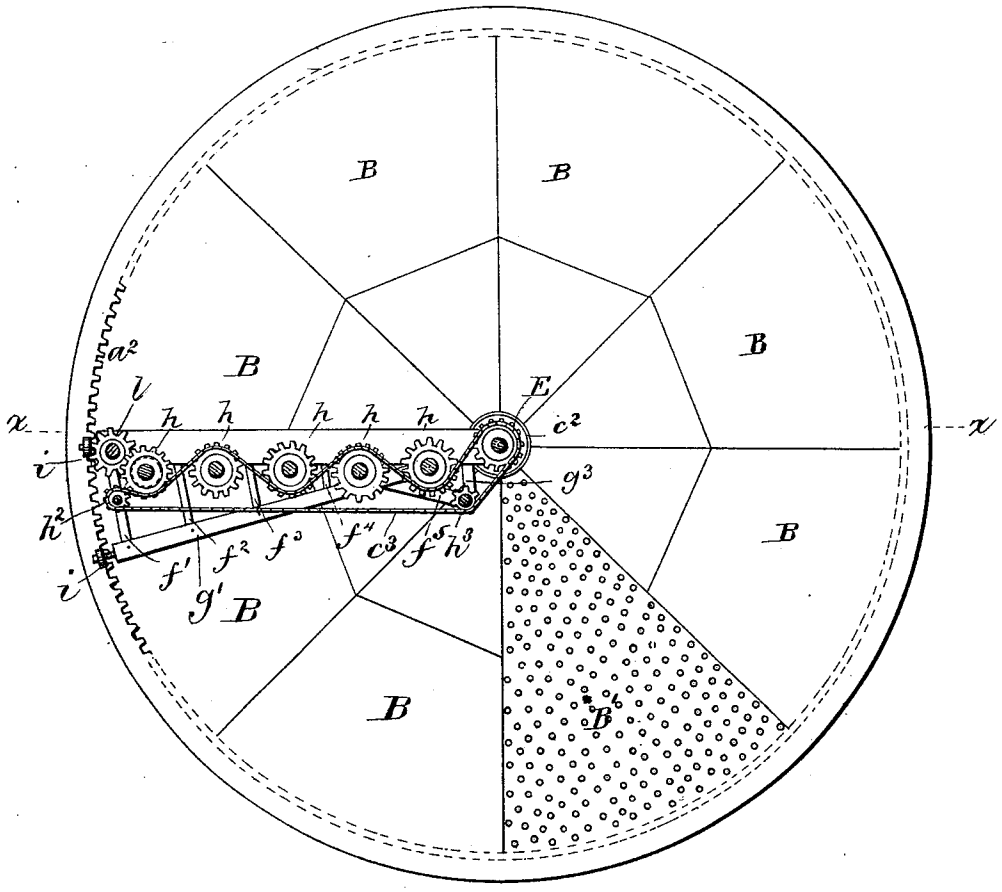
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H. & J. NOTH.

APPARATUS FOR MALTING.

No. 394,601. Patented Dec. 18, 1888.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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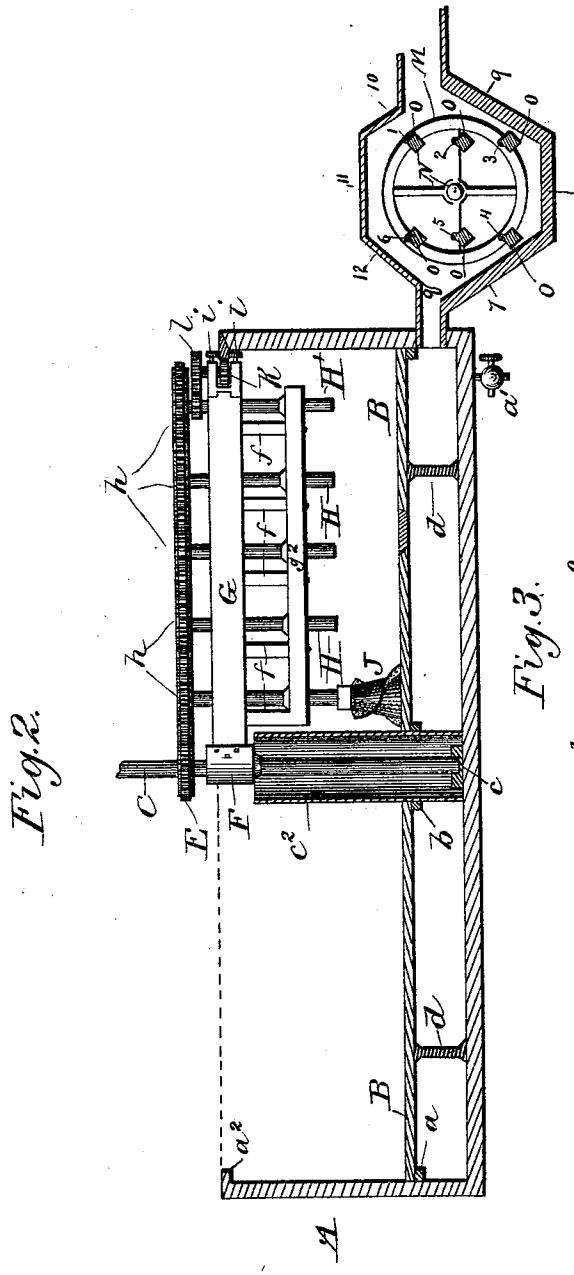


Fig. 2.

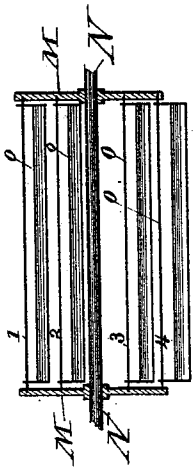


Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY NOTH AND JOHN NOTH, OF DAVENPORT, IOWA.

APPARATUS FOR MALTING.

SPECIFICATION forming part of Letters Patent No. 394,601, dated December 18, 1888.

Application filed April 16, 1888. Serial No. 270,785. (No model.)

To all whom it may concern:

Be it known that we, HENRY NOTH and JOHN NOTH, citizens of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented a new and useful Apparatus for Malting, of which the following is a specification.

Our invention relates to improvements in malting-machines in which a malting-tub is used, and the barley during its process of being made into malt and at such time as desired is stirred or turned over by means of wide screw-threads upon hollow rotating cones while moistened air is passed through said barley; and the objects of our improvements are, first, to provide mechanism in connection with the vertical main shaft through which power is transmitted to rotate the cones and also move the outer end of the laterally-swinging wing around the wall of the tub and its inner end around the circumference of the vertical main shaft; and, second, to provide mechanism for moistening the air which is passed through the barley.

The improvements herein stated are in connection with the malting-machine for which Letters Patent were granted to us April 3, 1888, being numbered 380,588. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of our machine, omitting the air-conducting tube and device for moistening the air. Fig. 2 is a vertical longitudinal section of our machine, as shown at line x x in Fig. 1, together with the air-conducting tube and end view of the wheeled frame and buckets for moistening the air, one end of the box being shown as removed; and Fig. 3 is a transverse longitudinal view of the wheeled frame and buckets for moistening the air.

Similar letters refer to similar parts throughout the several views.

A is the malt-tub, with false bottom, preferably in separate detachable sections, as at B, B, B, B, B, B, B, and B′, and preferably of boiler-iron, the outer edges resting upon projection or ring a on the inner surface of the tub about ten or twelve inches above its bottom.

C is the vertical main shaft, resting in bearing or well c in the center of the bottom of the tub. Around shaft C is a sleeve, c^2, the lower edge of which is fitted to the bottom of the tub, so as to be water-tight within. At a similar distance from the bottom of the tub on sleeve c^2 is a ring or projection, b, the inner edges of false bottom B resting thereon, and midway are standards d, resting on the bottom of the tub for additional support to false bottom B. False bottom B is perforated with holes about one-sixteenth of an inch in diameter, as shown at B′, to permit air to pass through. If desired, trap-doors may be constructed in the bottom of the tub and also above in false bottom for the purpose of removing the malt or conducting into a conveyer, and likewise a waste pipe and cock, a', may be inserted in the bottom of the tub for the purpose of drawing water off.

In the side of tub A, between its bottom and false bottom B, is an orifice for connection with an air tube or box; and, if desired, a gate or stop may be arranged for closing the orifice or regulating the quantity of air to be introduced.

On shaft C is a sprocket-wheel, E, and beneath is a loose sleeve, F, supported by collars upon said shaft, and attached to which, extending outwardly therefrom, is a laterally-swinging wing, preferably constructed of the beams G, g', and g^2, framed or otherwise connected together, beam g^2 being underneath beam G, attached by standards f, f, f, f, and f, and beam g', connected at its inner end to beam G and extending outwardly to the wall of the tub oblique to beam G, and attached thereto by cross-beams f' f^2 f^3 f^4. Cross-beams may also be attached, if desired, between beams g' and g^2 to add strength to the structure. On the same side of beam G extends beam g^3, stayed by cross-beam f^5. At the top and around the inner edge of tub A is a projection, a^2, the inner surface of which is provided with a continued series of cogs or spaced teeth. At the outer ends of beams G and g' are rollers i, i, i, and i, two upon each beam, and one above the other upon suitable shafts to permit rotation, one of said rollers bearing upon the upper surface and the other upon the under surface of projection a^2.

Two or more shafts, H, H, H, H, and H′ are vertically inserted in boxes through or attached to beams G and g^2, so as to permit ro-

tation, the upper portion of said shafts being provided with the sprocket-wheels *h*, *h*, *h*, *h*, and *h*. A supplemental sprocket-wheel, h^2, is attached upon a vertical shaft seated in cross-beam *f'*, and another sprocket-wheel, h^3, is similarly attached upon a shaft seated in beam g^3. These sprocket-wheels are omitted from Fig. 2, but are shown in Fig. 1. A continuous sprocket chain or belt, c^3, extends from sprocket-wheel E, around on opposite sides of sprocket-wheels *h*, *h*, *h*, *h*, and *h*, as shown in Fig. 1, and around supplemental sprocket-wheel, h^2, and thence around one side of supplemental sprocket-wheel, h^3, and thence around sprocket-wheel E, and by means of which sprocket chain or belt power is transmitted from shaft C to rotate the vertical shafts H, H, H, H, and H'. By the use of larger sprocket-wheels upon shafts H, or changing their position in a line slightly back of the line *x x* in Fig. 1, the sprocket chain or belt may be continued in the same line to engage the same side of each of the sprocket-wheels, and each of said shafts rotated in the same direction.

On vertical shaft H', beneath its sprocket-wheel *h*, is a cog-wheel, *j*. (Shown in Fig. 2.) At the outer end of beam G is a longitudinal transverse slot or opening, in which is inserted the cog-wheel *k*, arranged to engage with fixed cogs or spaced teeth in projection a^2 upon the wall of tub A, which cog-wheel *k* is rigidly attached to a short vertical shaft extending through the outer end of beam G in suitable bearings, the upper end of which shaft has rigidly attached the cog-wheel *l*, arranged to engage with said cog-wheel *j*. The rotation of shaft H' causes similar rotation to cog-wheel *j*, and through the medium of cog-wheel *l*, engaging with cog-wheel *j*, cog-wheel *k* is caused to rotate and engage with the fixed cogs or notches of projection a^2, thus causing the outer end of the laterally-swinging wing to continuously travel around the wall of the tub.

Hollow cones J, with wide screw-threads projecting therefrom, are attached by bolts or other suitable means to the bottom of shafts H, H, H, H, and H', and extend downward nearly to false bottom B.

In the drawings, Fig. 2, but one cone, J, is shown; but it is intended that each shaft H H, H, H, and H' shall have attached thereto a similar cone, J, and such number of shafts and cones may be used and cones of such form and size as deemed requisite.

We construct a wheeled frame by attaching two wheels, M M, rigidly to the shaft N at suitable distances apart. The two wheels M M are connected rigidly by the rods 1, 2, 3, 4, 5, and 6. If desired, a greater number or a less number of rods may be used.

V-shaped troughs (represented by the letters *o*) are hung loosely by hangers at each end of the trough to one or more of the rods 1, 2, 3, 4, 5, and 6. At the bottom of each of said troughs are a series of perforations or holes through which the water in the troughs may drip. A suitable box is constructed, within which the wheeled frame is inclosed, which may be in form as shown by 7, 8, 9, 10, 11, and 12 in Fig. 2, the ends of which are closed, and in which the projections of either end of shaft N have bearings, so that the wheeled frame may revolve through power applied upon a belt-wheel on shaft N, outside of the box. The lower part of the box is constructed to hold water, which may be supplied to it through a pipe, the amount of such supply being regulated by a faucet or water-cock, as desired. Orifices *p* and *q* are made upon opposite sides of the box for admitting a tube or box, through which the air is forced into the box by means of a fan or air-pump and for the escape of the air thus forced into the box and conveyance of the same into the space between the false bottom and bottom of the tub A.

In the construction of the laterally-swinging wing the number of beams and general form may be changed as desired.

In the operation of our machine constructed substantially as herein described the barley is placed in the tub upon its false bottom, and then submerged in water until in condition of germination, when the water is removed or drawn off, and when dried sufficiently power is applied to rotate the main central vertical shaft, which in turn, by the mechanism herein described, transmits power for rotating the cones and causing the outer end of the laterally-swinging wing to continuously traverse around the wall of the tub, thus raising and stirring up the barley upon the false bottom of the tub, and at the same time air being forced through the air tube or box into the wheeled frame-box at *p* by means of a fan or air force pump, and the wheeled frame being rotated by suitable power therefor applied to its shaft, and the bottom or well part of said wheeled frame-box being supplied with water, the troughs of said wheeled frame passing through the water in their rotation are thus supplied with water, which drips continuously through the perforations as the wheeled frame revolves, and thus moistens the air, which is forced through the wheeled frame-box and out at the exit *q*, and thence passes into the space beneath the false bottom of the tub and upward through the perforations and through the barley, which is being stirred by the revolving threaded cones. After the barley has arrived at the proper condition, termed "malt," it is removed from the tub to the kiln for drying.

We are aware that through the invention already secured to us by the Letters Patent herein referred to a laterally-swinging wing has been attached to a revolving central vertical shaft in a tub, and the wing caused to traverse around the outer wall of the tub by means of the revolution of a worm upon the outer end of said wing engaging while in revolution with teeth or cogs upon the top of the

walls of such tub, and at the same time hollow screw-threaded perforated cones suspended to vertical shafts attached to said wing have been rotated through the medium of beveled gearing rotating a shaft, with beveled gearing to engage corresponding beveled gearing upon said vertical shafts, and such combination or sub-combinations we do not now claim to secure by the Letters Patent here applied for.

We are also aware that in supplying air to said tub a tube or box, through which the air is forced, has been provided with a sprinkler with water dripping from it to moisten the air; and such combination we do not here claim, broadly.

What we claim as new, and desire to secure by Letters Patent, is—

In a malting-machine having a tub the upper part of which wall is supplied with fixed cogs or spaced teeth, a central vertical power-shaft therein, a laterally-swinging wing attached thereto extending to the wall of said tub, and vertical shafts with hollow screw-threaded perforated cones pendent to said wing, the sprocket-wheel E, attached to said central shaft, and sprocket-wheels h, h, h, h, and h, supplemental sprocket-wheels h^2 and h^3 and their respective shafts, all attached to said laterally-swinging wing, sprocket chain or belt c^3, to engage with and rotate said sprocket-wheels, except rotating said sprocket-wheel E, together with cog-wheels j, l, and k, the last to engage with the fixed cogs or spaced teeth on the upper part of the wall of said tub, for the purposes specified, and substantially as described.

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