

No. 748,875.

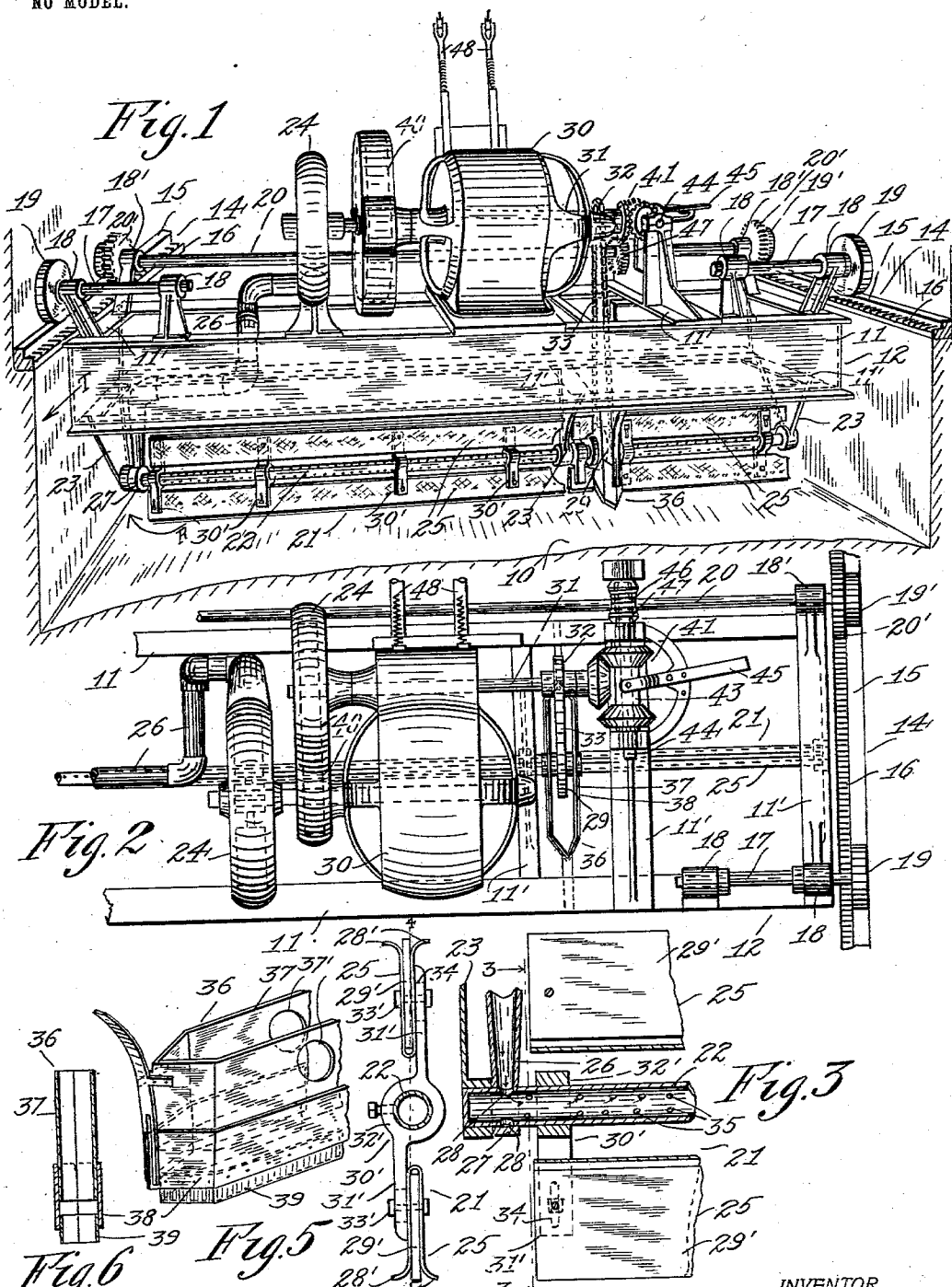
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MALT TURNER AND AERATOR.

APPLICATION FILED MAY 20, 1903.

NO MODEL.



WITNESSES:

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MALT TURNER AND AERATOR.

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To all whom it may concern:

Be it known that I, JOHN MUELLER, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Malt Turners and Aerators, of which the following is a specification.

My invention relates to improvements in apparatus for turning malt spread upon a malt-floor, and has special reference to a mechanically-operative device of this class which acts to both turn and aerate the malt.

Among numerous objects attained by this invention and readily understood from the following specification and accompanying drawings, included as a part thereof, is the production of a simplified and inexpensive malt turner and aerator embodying essential features of adaptability, utility, and general efficiency, which facilitates the turning of the malt during the flooring thereof and insures the separation of the grain and the expulsion of the confined gases.

The above-mentioned and other desirable objects are attained by the constructions, combinations, and arrangements of parts as disclosed on the drawings, set forth in this specification, and succinctly pointed out in the appended claims.

With reference to the drawings filed herewith and bearing like reference characters for corresponding parts throughout, Figure 1 is a view in perspective of my improved apparatus viewed from one side of the carriage. Fig. 2 is a plan view of one end portion of the carriage and shows the driving mechanism. Fig. 3 is a vertical longitudinal section of one end portion of the malt-lifter, taken on line 4 4 of Fig. 4. Fig. 4 is an end view of the lifter with the spindle shown in transverse section on line 3 3 of Fig. 3. Fig. 5 is a perspective view of one end portion of the casing for the driving-wheel on the spindle, and Fig. 6 is a vertical transverse section of said casing.

This apparatus is adapted to travel across a floor, as 10, upon which the malt is spread, and it operates to both turn the malt and simultaneously subject same to an air-blast, so that the grains are separated from each

other and the accumulated gases positively driven out.

The apparatus includes a carriage 12, preferably consisting of opposite I-beams 11, substantially equal in length to the width of the malt-floor, and suitable ties or cross-pieces 11', connected with said beams and arranged to support the several parts of the apparatus. This carriage is mounted on opposite tracks 14, arranged along the side edges of the malt-floor at suitable elevation and each consisting of a rail-section, as 15, and a rack-section 16. At each end of the carriage, adjacent one side, are mounted stub-axes 17, which are rotatably supported in suitable bearings arranged on stands 18, securely fastened to the carriage, and upon the outer ends of these axes are mounted truck-wheels 19, which travel upon the said rail-sections of tracks 14. At the opposite side of the carriage is mounted a driving-shaft 20, which is rotatably supported in suitable bearings arranged on stands 18', securely fastened to the carriage adjacent each end. This drive-shaft extends the full length of the carriage and projects from each end, and upon the end portions thereof are secured truck-wheels 19', which travel upon rail-sections 15, and gears 20' are also secured on these ends in mesh with the rack-section 16 and serve the move the carriage along the tracks when the driving-shaft is rotated.

Pending from carriage 12 is a rotatable malt-lifter 21, which includes a perforate tubular spindle 22, disposed longitudinally of the carriage and embodied as convenient means for both supporting the blades, as 25, of the lifter and distributing the compressed fluid employed to aerate and separate the malt. This spindle is rotatably supported in suitable bearings arranged on hangers, as 23, which are fastened to the carriage, and the bore of this spindle is connected with a suitable device for supplying fluid under pressure, as a blower 24, which is mounted on carriage 12 and discharges into a suitable conduit 26, leading to one end of the spindle and having an annular twyer, as 27, at the discharge end, which fits the spindle snugly, and has a suitable orifice in the wall, which directs the fluid to suitable ports 28, formed

in the wall of the bore of the spindle relatively to said orifice. Upon this spindle are mounted the malt turning or lifting blades 25, which are radially disposed and arranged at diametrically opposite points and are each composed of a strip of sheet metal folded longitudinally to form opposite sides, which are bent outwardly along the free side edges to provide opposite lips 28', and between the sides of each blade a strip 29', of rubber or like flexible material, is placed, with one side edge resting just beyond the line of sweep of the lips as a tip, and this tip-section is secured in place by means of clamping-bolts passed through suitable apertures in the sides of the blade and the tip-section.

The blades are mounted on carriers 30', which are secured on the spindle at suitable separation, and each carrier includes a pair of oppositely-disposed arms 31', Fig. 4, formed integral with a hub 32', adapted to receive the spindle 22, and these arms are arranged at opposite sides of a diametrical line passing through the hub, so that the blades will lie radial to said hub at diametrically opposite points and the arms counterbalance each other. The blades are secured on the arms with an opening between the inner side edges and the spindle by means of clamping-bolts 33', which are passed through suitable apertures in the blades and elongated slots 34 in the arms, which slots allow of said blades being moved in and out relatively to the center of the spindle, so that they can be adjusted to a nicety relatively to the malt-floor, while the opening between the blades and the spindle permits of free clearance of the gases from the faces of the blades when the lifter is acting in the malt.

In the wall of the spindle 22, at each side of the base edge of each blade, are formed rows of discharge-orifices, as 35, which are suitably arranged to direct the compressed fluid passing along the bore of the spindle for discharge across the faces of the blades, so that the grains of the malt which are matted together by the intertwining of the sprouts will be separated by this blast and the confined gases liberated and driven out, and at a suitable point intermediate the ends of the spindle a driving-wheel or sprocket is fixedly mounted thereon and takes power from a suitable reversible motor 30, mounted on the carriage 12 through the medium of a drive-shaft 31, driven from said motor, a sprocket 32 on said shaft, and a sprocket-chain 33, leading to sprocket 29.

Inclosing the driving-wheel 29 is a narrow telescoping casing 36, which acts to keep the malt clear of said wheel and is formed of sheet metal and rendered substantially V-shaped at each end to better plow through the malt as the carriage 12 travels. This casing includes an upper section 37, which is fixedly mounted on the carriage and has opposite apertures, as 37', in the side walls to receive the hubs of wheel 29 and a vertically-

movable lower section 38, which slidably embraces the lower edge portion of the upper section and adjusts itself to irregularities in the floor, and this lower section is provided with a bearing-strip 39 along the lower edge, which is composed of leather or rubber and bears upon the malt-floor.

The drive-shaft 31 is supported on the carriage adjacent one side in suitable journals and is connected with the armature-shaft of the motor 30 by suitable spur-gears, as 40, and the armature-shaft is extended in length to carry the vanes of the blower 24. This shaft 31 is also operatively connected with the driving-shaft 20 of the carriage by suitable reversing mechanism, as a train of three bevel-gears 41, one of which is secured on shaft 31 as a driver and the other two secured in opposing positions on a sleeve 43, which is slidably engaged with a feather on a cross-shaft 44 and is operated by a shipper 45, so that either of the driven gears can be brought into mesh with the driving-gear. On the cross-shaft is secured a worm 46, which meshes with a worm-wheel 47, fixedly mounted on the driving-shaft 20 of the carriage, so that the driving-shaft 20 will be driven at a comparatively slow rate of speed, and the motion of this shaft can be reversed by shifting the sleeve 43 without reversing the motion of the motor, or the motor can be reversed without reversing the motion of the driving-shaft.

The motor is electrically connected with a suitable source of electric supply, as a stationary dynamo, through the medium of two parallel trolley-wires connected with the dynamo and arranged overhead along the malt-floor, and suitable trolley-poles, as 48, mounted on the carriage and having the ordinary attendant parts and connections for taking the electric current from one trolley-wire and conducting it to the motor and then back to the other trolley-wire.

Granted installation of the apparatus, an operation thereof to turn and aerate the malt occurs substantially as follows: The electric current is properly directed to the motor to drive the carriage in the direction indicated by the arrow marked T in Fig. 1, and the shipper 45 is set to engage the proper driven gear of train 41 with the driving-gear to rotate the proper lifter in the direction indicated by the arrow marked R, so that the lifter will act to lift the malt in front of the machine and throw it rearwardly over the spindle, while the air discharging laterally from the orifices in the spindle will strike upon the malt, as lifted and serve to separate the grains which are massed and thoroughly aerate the malt and thereby render it practicable to prepare malt by the flooring system during the hot season, which has heretofore been impracticable owing to rapid sprouting and fermentation of the malt.

By using the fluid-blast on the malt as turned the temperature of the bed of malt

can be regulated to a nicety and the gases positively driven out and the brew thereby greatly improved, and by using the reversible motor and connecting same with the driving-shaft of the carriage by suitable reversing mechanism, as the gears 41, the direction of rotation of the malt-lifter can be reversed during the final advancing movement of the carriage as it approaches the end of the bed of malt and the grain thereby swept rearwardly, so that none of the grains will be thrown beyond the limit of travel of the carriage.

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

1. In a malt turning and aerating apparatus; the combination of a carriage, a malt-lifter operatively mounted on said carriage and having a perforate tubular spindle, and a blower mounted on said carriage and connected with the bore of said spindle.

2. In a malt turning and aerating apparatus; the combination of a carriage, a malt-lifter operatively mounted on said carriage and comprising a perforate tubular spindle, and oppositely-disposed blades, a blower mounted on said carriage and connected with the bore of said spindle, and a motor mounted on said carriage and operatively connected with said lifter and blower.

3. In a malt-turner; the combination of a carriage, a motor mounted on said carriage, a shaft driven by said motor, a rotatable malt-turner operatively connected with said shaft, a driving-shaft for the carriage, a bevel-gear on first said shaft, a cross-shaft operatively connected with said driving-shaft, a sleeve on said cross-shaft having opposite bevel-gears related to said gear on the first said shaft, and a shipper for said sleeve.

4. In a malt-turner; the combination of a carriage, a rotatable malt-turner having a driving-wheel, and a telescoping casing enclosing said wheel and comprising an upper section secured to said carriage, and a lower section slidably fitting the upper section.

5. In a malt-turner; the combination of a

carriage, a rotatable malt-turner having a driving-wheel, and a telescoping casing enclosing said wheel and comprising an upper section pointed at the ends and secured to said casing, and a lower section slidably fitting the upper section and having a strip of flexible material along the lower edge.

6. In a malt turner and aerator, the combination of a carriage, a perforated spindle carried thereby, malt-lifting means secured to said spindle, and an annular twyer encircling said spindle, and means on said carriage for supplying fluid through said twyer and spindle, substantially as described.

7. In a device of the character described, the combination of a carriage, a malt-lifter carried thereby and having a spindle provided with inlet and outlet ports, a twyer encircling said inlet-openings, and a blower carried by said carriage and connected with said twyer, substantially as described.

8. In a device of the character described, the combination of a carriage, a horizontally-disposed malt-lifter carried thereby, said lifter comprising a foraminous spindle, and adjustable radially-disposed blades mounted on said spindle and spaced therefrom, a twyer for supplying fluid to said spindle, and means for rotating said spindle in said twyer.

9. In a device of the character described, the combination of a carriage, a malt-lifter carried thereby, said lifter comprising a perforated spindle, oppositely-disposed blades secured to said spindle, said blades being formed of sheet metal and doubled upon themselves and having outturned edges, a flexible material secured between the doubled portions of the blades, said blades being spaced from said spindle to permit fluid to pass through the said perforations therein, substantially as described.

Signed at Seattle, Washington, this 7th day of May, 1903.

JOHN MUELLER.

Witnesses:

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