No. 832,874. PATENTED OCT. 9, 1906.

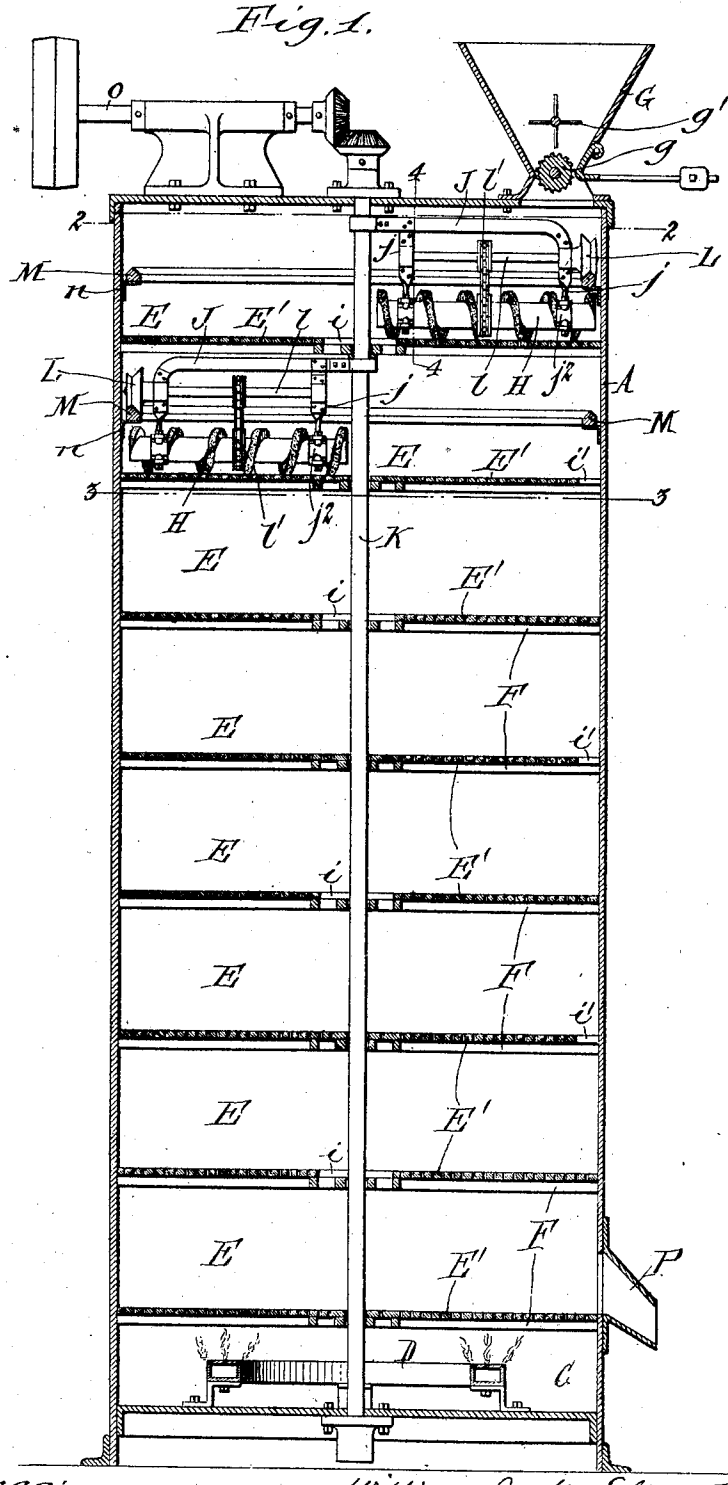
W. J. McELROY.

DRYING APPARATUS.

APPLICATION FILED NOV. 4, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

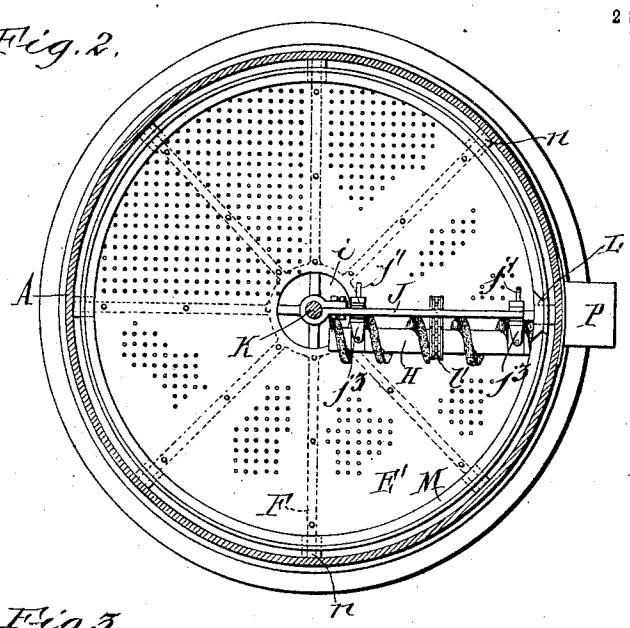


Fig. 3.

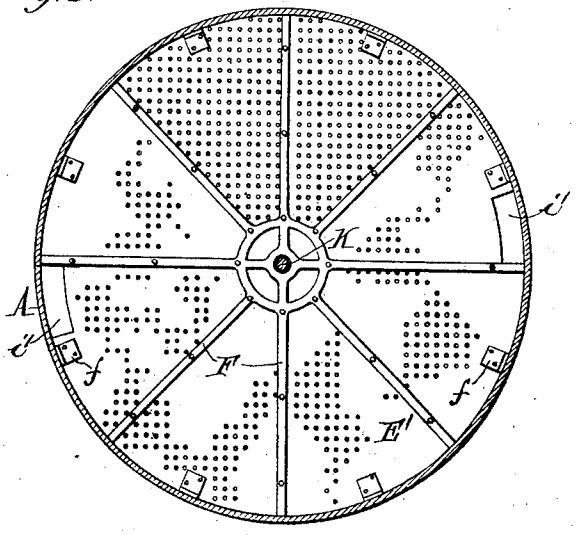
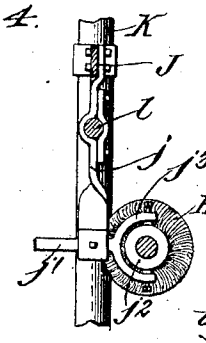


Fig. 4.



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DRYING APPARATUS.

No. 832,874. Specification of Letters Patent. Patented Oct. 9, 1906.

Application filed November 4, 1905. Serial No. 285,818.

To all whom it may concern:

Be it known that I, WILLIAM J. McELROY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Drying Apparatus, of which the following is a specification.

This invention relates more especially to that class of driers comprising a number of superposed drying-chambers through which the material passes successively from the top to the bottom of the apparatus, the drier having means for conveying the material from the periphery toward the center in one chamber and from the center toward the periphery in the next, whereby the material is caused to take the longest course through the apparatus and thoroughly dried in a comparatively short time.

The objects of my invention are to simplify the construction of the conveying devices and to drive them in such manner as to relieve the parts from undue strains.

In the accompanying drawings, consisting of two sheets, Figure 1 is a sectional elevation of a drying apparatus embodying the invention, the conveying devices being omitted from the chambers below the two uppermost ones. Fig. 2 is a horizontal section in line 2 2, Fig. 1. Fig. 3 is a similar section in line 3 3, Fig. 1, looking upward. Fig. 4 is a fragmentary vertical section in line 4 4, Fig. 1, on an enlarged scale.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the stationary shell or casing of the apparatus, which is imperforate and preferably of cylindrical form, as shown.

C is a heating-chamber arranged in the lower portion of the casing and containing a suitable heater, such as a gas-burner D. Above this chamber is a series of superposed drying chambers or compartments E, having perforated floors or bottoms E′, through which the heat and hot air are free to pass for subjecting the grain or other material in all of the chambers to the drying action of the same. The floors or disks E′ are stiffened by skeleton frames or spiders F and are supported by brackets *f* or other suitable means.

On top of the casing is mounted a feed-hopper G, which supplies the material to be dried to the peripheral portion of the uppermost drying-chamber E and which preferably contains a feed-roller *g* and a rotary stirrer *g′* to insure a uniform supply of the material to the apparatus.

In each drying-chamber is arranged a horizontal conveyer H, preferably consisting of a spiral brush which propels the material from the periphery toward the center of the chamber, or vice versa, according to the direction in which it trends, each of the drying-chambers in which the material is moved inwardly being provided with a central discharge-opening *i*, while those in which the material is moved outwardly are provided with peripheral discharge-openings *i′*, arranged diametrically opposite each other.

Each of the conveyers is carried by a radial arm or frame J, secured to an upright shaft K, passing centrally through the various chambers C E. This arm is provided with hangers *j*, in the lower ends of which are mounted transverse rods or brackets *j′*, carrying bearings j^2, in which the conveyer-shaft is journaled. Preferably the rods *j′* are adjustable in their hangers in a direction at right angles to the conveyer, so that the latter can be adjusted to a more or less oblique position with reference to the radial carrying-arm J, if desired. To enable the bearings j^2 to accommodate themselves to such an angular position of the conveyer, they are swiveled at their upper and lower sides in yokes j^3, carried by the adjustable rods *j′*, as best shown in Fig. 4.

The conveyer extends from the wall of the casing to the central shaft K and is driven by suitable means from a horizontal shaft *l*, journaled in the hangers *l*, the transmitting means shown in the drawings consisting of a sprocket-chain *l′*, running around sprocket-wheels on said shaft and the conveyer-shaft. The shaft *l* is rotated by a grooved wheel L, secured to its outer end and running upon a fixed circular track M, arranged adjacent to the inner side of the casing A. In the construction shown this track is mounted on brackets *n*, secured to the casing. As shown in the drawings, the sprocket-chain is arranged at or near the center of the conveyer

to permit of the angular adjustment hereinbefore described.

The upright shaft K is suitably geared at its upper end to a horizontal driving-shaft *o*.

It will be understood from the foregoing that each conveyer-brush is caused to sweep over the perforated bottom of the corresponding drying-chamber by reason of its carrying-arm being secured to the rotary upright shaft K and that it is at the same time turned on its axis by being geared with the horizontal shaft *l*.

The spiral brushes in the several chambers are arranged to trend in the proper direction to move the material toward the discharge-openings *i i'*. The brushes, while conveying the material toward these openings, also serve by their sweeping action to remove the sweat or moisture from the kernels and keep the perforations of the floors or disks E' open or unobstructed, permitting the free passage of the heat and hot air through the several compartments and insuring a thorough drying of the material in all of the same.

An important feature of my invention is the arrangement of the driving wheel or pulley L at the outer end of each shaft *l* and of the track M adjacent to the wall of the casing. By this arrangement the outer end of the conveyer is not only firmly supported, but its carrying-arm J is largely relieved from strains and the conveyer can be driven with a minimum expenditure of power.

To equalize the strain on the upright shaft K, the conveyers in adjacent drying-compartments are arranged on opposite sides of said shaft, as shown in Fig. 1.

In the operation of the machine the material after passing through the successive chambers is finally discharged in a thoroughly dry state through a spout P at the periphery of the lowermost drying-chamber.

The conveying action of the brushes, due to the spiral arrangement of their bristles, may be augmented by adjusting the same at the proper angle to the carrying-arms J. For this purpose the brushes which convey the material toward the center of the apparatus are adjusted so that their outer ends stand in advance of their inner ends, while the brushes which convey the material toward the periphery of the apparatus are adjusted so that their inner ends stand in advance of their outer ends.

My improved apparatus is especially desirable for drying grain and malt, but is also useful for drying coffee and various other materials.

I claim as my invention—

1. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, means for driving the shaft, a track arranged in the chamber adjacent to its wall, a supporting arm or frame secured to said shaft within the drying-chamber, a rotary conveyer carried by said arm, and a driving-wheel running on said track and operatively connected with the conveyer, substantially as set forth.

2. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, means for driving the shaft, a track arranged in the chamber adjacent to its wall, a supporting arm or frame secured to said shaft within the drying-chamber, a rotary conveyer carried by said arm, a shaft also carried by the arm, a driving-wheel for the last-named shaft running on said track, and means for transmitting motion from the last-named shaft to the conveyer, substantially as set forth.

3. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, means for driving the shaft, a track arranged in the chamber adjacent to its wall, a supporting arm or frame secured to said shaft within the drying-chamber, a rotary conveyer carried by said arm, a horizontal shaft journaled on said arm between the same and the conveyer and provided at its outer end with a driving-wheel which runs on said track, and means for transmitting motion from the last-named shaft to the conveyer, substantially as set forth.

4. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, a supporting arm or frame secured to the shaft within the drying-chamber, a rotary conveyer carried by said arm and capable of angular adjustment relative thereto, and means for rotating the conveyer, substantially as set forth.

5. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, a track arranged in the chamber adjacent to its wall, a supporting arm or frame secured to said shaft within the drying-chamber, a rotary conveyer carried by said arm and capable of angular adjustment relative thereto, a rotary shaft also carried by the arm and having a driving-wheel which runs on said track, and means for transmitting motion from the last-named shaft to the conveyer, substantially as set forth.

6. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, an arm or frame secured to said shaft within the chamber, brackets carried by said frame and adjustable in a direction at an angle thereto, a rotary conveyer mounted in said brackets, and means for rotating the conveyer, substantially as set forth.

7. The combination of a casing containing a drying-chamber, an upright shaft arranged therein, an arm or frame secured to said shaft within the chamber, brackets carried by said

frame and adjustable in a direction at an angle thereto, swiveling bearings carried by said brackets, a rotary conveyer journaled in said bearings, a track arranged adjacent to the wall of the casing, a horizontal shaft journaled in said frame and having a driving-wheel which runs on said track, and means for transmitting motion from the last-named shaft to the conveyer, substantially as set forth.

Witness my hand this 2d day of November, 1905.

WILLIAM J. McELROY.

Witnesses:
C. F. GEYER,
E. M. GRAHAM.