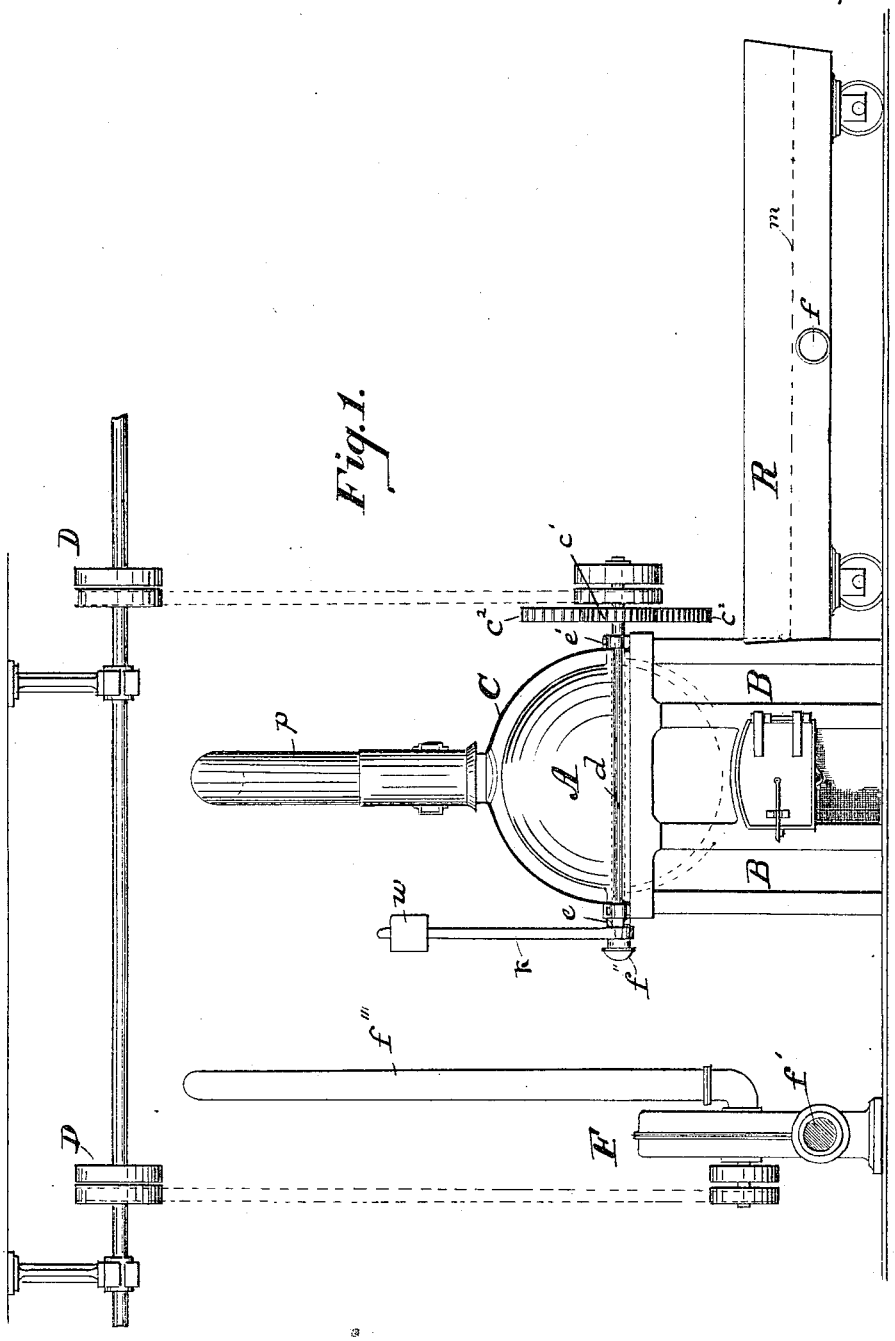
(No Model.) 2 Sheets—Sheet 1.

J. LEVY.

COFFEE ROASTER.

No. 344,388. Patented June 29, 1886.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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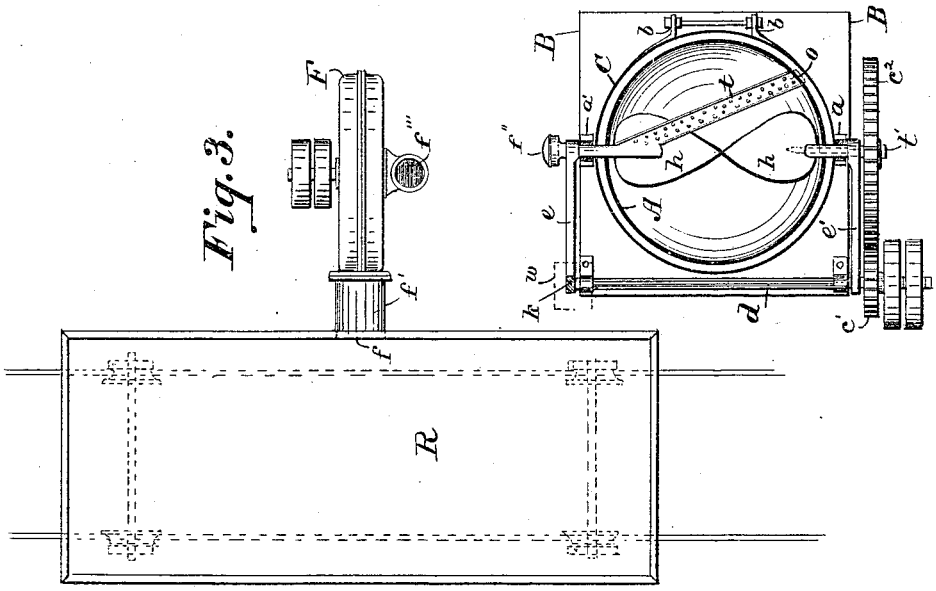

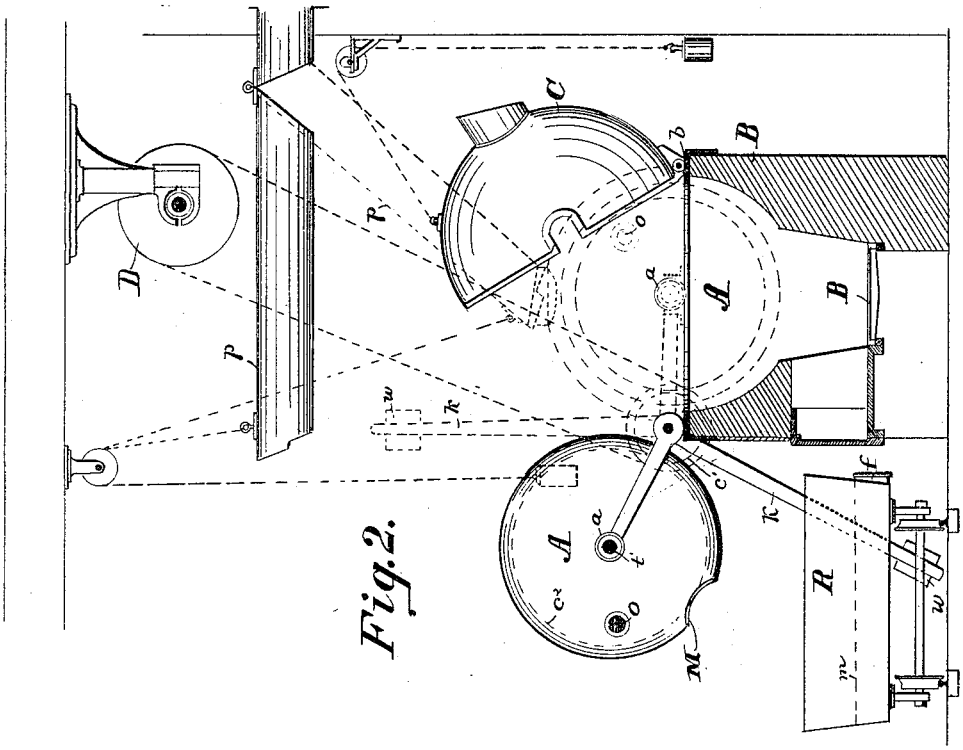

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UNITED STATES PATENT OFFICE.

JULIUS LEVY, OF CINCINNATI, OHIO.

COFFEE-ROASTER.

SPECIFICATION forming part of Letters Patent No. 344,388, dated June 29, 1886.

Application filed September 10, 1884. Serial No. 142,630. (No model.)

To all whom it may concern:

Be it known that I, JULIUS LEVY, a citizen of the United States, residing at Cincinnati, Ohio, have invented new and useful Improvements in Coffee-Roasting Apparatus, of which the following is a specification.

My invention relates to an improved apparatus for preparing roasted or burned coffee, the object being to improve the quality of the product and conduct said operation in an expeditious and economical manner on a commercial scale.

The subjoined description and explanation of my invention will be more clearly understood in connection with the accompanying drawings, exhibiting a form of apparatus suitable for working the same, in which drawings—

Figure 1 is a general front elevation of the entire apparatus; Fig. 2, a side elevation, partly sectioned, exhibiting the roasting-vessel in position for discharging its contents; Fig. 3, a plan section of the apparatus, taken through the axis of the roasting-vessel, showing its internal mechanism.

The proper roasting of coffee, though apparently a simple and familiar process, involves many serious difficulties when the operation is conducted on a commercial scale, and is rarely accomplished successfully, owing to the imperfect apparatus employed and ignorance of the necessary conditions.

It is absolutely necessary that the process of roasting should be gradual and uniform, the coffee-berries being freed from the refuse, hulls, &c., which accompany them in commercial packages, and in burning impart deleterious properties and flavor to the sound berries; also that the roasting operation should be arrested and absolutely cease at the point where caffeine is developed, and that the escape of the volatile matter from the berry be prevented. These conditions are essential to the production of a really good article of roasted coffee, which shall yield the full benefit of its choice and desirable properties in subsequent use, and their attainment is necessarily dependent upon the exact observance of the necessary conditions and the character and perfect operation of the apparatus employed.

The essential features of an apparatus for this purpose are, and my invention in this respect consists in, first, suitable means for the gradual and uniform roasting of the berries—that is, a furnace and roasting-vessel so constructed as to expose the berries thoroughly and uniformly to the action of heated surfaces for a given length of time; second, means for separating and removing the hulls and other refuse and carrying off deleterious vapors generated by the burning of such refuse; third, suitable provision for quickly removing the contents of the roasting-vessel when the operation is completed, and means for arresting the roasting operation, which otherwise would continue from the absorbed heat of the mass of berries or the containing-vessel.

Referring to the drawings for illustration, the following description will render clear and intelligible the construction and operation of the apparatus in detail.

The roasting-vessel A is preferably of spheroidal form, mounted on suitable trunnions, *a*, which, for reasons presently to be explained, are made hollow upon a furnace or fire-pot, B, into which its lower half projects, while its upper part is covered by a hemispherical hood, C, hinged at the rear to the surface-plate *b* of the fire-pot. By means of the hood C the heat is distributed around the entire surface of the roaster A, a single hinged joint of pipe, *p*, provided with counterbalancing-weight, as shown, forming the connection with the chimney-flue.

Rotation is given the roaster A by means of spur-gears *c c*, one attached to its trunnion, *a*, and the other to a counter-shaft, *d*, journaled upon the face-plate of the fire-pot across the front, power being communicated to the counter-shaft in any convenient manner, as by band and pulleys from line-shafting D.

The arrangement for removing and emptying the roasting-vessel is as follows: To the counter-shaft *d* are attached supporting-arms *e e*, extending at the sides of the vessel A, and embracing its trunnions. One arm, *e*, is extended into a bell-crank lever, *k*, to which a counter-weight, *w*, is attached, maintaining a vertical position during the roasting operation and assisting by its weight in reversing the roaster A, when the vertical handle is

pulled toward the operator and holding it off the fire while the contents are removed.

During the roasting the smoke and dust and the loosened hulls of the berries are drawn into a hollow tube, *t*, perforated with holes removably inserted diagonally into the roasting-vessel A at O, and connected to the hollow axis of the latter near one end. Said hollow axis is provided with means for connecting it at *f'''* to the intake *f'* of an exhaust-fan, F, by suitable piping. Upon rotating the fan the air-current withdraws into the perforations of the hollow tube *t* and carries off through the escape-pipe *f'''* into the chimney-flue all the loosened hulls and dust which in burning would give an unpleasant flavor to the coffee. The diagonal position of the tube is advantageous in intercepting the impurities in the coffee, as the berries are loosened and scattered by falling upon the wings or vanes *h*, fixed to the axis of the roaster and rotating with it. The tube likewise carries off all smoke and other gases which might contaminate the breathing air of the room.

A tester or spoon, *t'*, is inserted through the hollow axis at the geared end to extract samples and regulate the time of roasting. The aperture may be otherwise closed by a removable plug or cap.

A carriage, R, is provided, moving on a track in front of the furnace and extended to one side to the exhaust-fan F, provided with a perforated false bottom, *m*, and adapted to be connected at *f* to the exhaust-fan. The object is to draw a current of cool air through the heated mass of berries when emptied therein, and quickly cool them and arrest further roasting.

The hemispherical cover is counter-weighted, as shown, for convenience in operating.

The heating-furnace, flue, shafting, exhaust-fan, &c., are of the usual construction, and present no unusual features.

Certain details in the construction of the spherical roasting-vessel and its supports are best explained in the following description of the mode of operating the machine. Having provided the kind and amount of coffee it is desired to roast, I turn the roaster A into the upright position, open a slide, M, and introduce the coffee, close the slide, and, having replaced the cover C, start the machinery which rotates the vessel. The opening *f'''*, at the end of the hollow axis rotating in the trunnions *a*, is meanwhile connected with the exhaust-fan F, so that a current of air is being drawn through the perforated pipe *t*, which, as the vessel rotates, presents its entire surface to the mass of berries thoroughly loosened by the blades of the vane *h h*, which are fixed in the vessel and scatter the berries as they fall against them. The hulls and the dust and smoke are thus carried away and forced into the chimney-flue.

The spoon or tester *t'* furnishes a means of withdrawing samples from time to time to determine the degree of roasting without stopping the rotation of the roasting-vessel, which for an instant even would burn or char a few berries and spoil the mass. When, by means of his samples, the operator finds the roasting sufficiently advanced, he raises the hood C, pulls the vertical handle *k* and weight *w* toward him, reversing the vessel, as shown in Fig. 2, rotation meanwhile continuing, since the wheels c' c^2 still remain in gear. Through the hollow axis a certain amount of sugar is now introduced, which melts into caramel and glazes or coats the coffee-berries thoroughly, preventing the escape and loss of the "caffeine."

If necessary, the vessel may be returned to the furnace for a suitable time and is then again reversed, (rotation continuing,) the slide M is opened, and the contents at once emptied into the receiving-carriage R, which in turn is quickly connected to the exhaust-fan F, and the cool air drawn thereby through the berries cools them and prevents further roasting.

It will be seen that the desiderata of coffee-roasting are secured in a high degree by this means, and the coffee produced must of necessity be of a high grade of excellence, and insure more economy by its use than has heretofore been the case.

I claim and desire to secure by Letters Patent of the United States—

1. In a coffee-roasting apparatus, the combination of a rotating vessel provided with hollow trunnion, and having a gear connected with one of said trunnions, a fixed counter-shaft provided with a gear meshing with said trunnion-gear, lifting-arms fulcrumed at one end to said counter-shaft and at the other end connected to the trunnions of the vessel, and the weighted lever K for turning said lifting-arms on their fulcrum, substantially as described.

2. In a coffee-roasting apparatus, the combination, with a rotating spheroidal roasting-vessel provided with inwardly-extending trunnions, of spiral vanes or blades supported by said trunnions and rotating with the vessel, substantially as described.

3. In coffee-roasting apparatus, the roasting-vessel A, provided with hollow trunnions (one or both) and with a perforated pipe, *t*, connected with one of said openings, in combination with exhaust apparatus, substantially as described, for carrying off refuse, hulls, &c., during the roasting operation, as set forth.

4. In coffee-roasting apparatus, the combination of the furnace B, rotating and removable roasting-vessel A, the hinged hood C, and removable pipe-connection *p*, substantially as set forth.

5. The combination, with the fan F, of a carriage, R, provided with a perforated false bottom, *m*, and an opening, *f*, to connect it with the exhaust-fan, and a rotating roasting-vessel, A, for transferring its contents into the bottom *m*, to be cooled by the exhaust-fan F, substantially as described.

6. In coffee-roasting apparatus, the spheroidal rotating roasting-vessel A, in combination with fixed spiral vanes *h* and removable perforated exhaust-pipe *t*, arranged and operating substantially as and for the purpose specified.

7. In combination with the furnace B and spheroidal roasting-vessel A, rotating in bearings upon the furnace-plate, a rocking shaft, *d*, journaled upon the furnace-plate parallel to the axis of the roaster, provided with rigid arms *e e'*, embracing the trunnions of the roaster, a manipulating-arm, *k*, and with two loose pulleys, one of which is attached to a spur-gear, *c'*, meshing with a spur-gear, c^2, upon the trunnion of the rotating vessel, to receive and transmit rotating power to the roaster, while permitting the removal of the latter from the fire, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JULIUS LEVY.

Witnesses:
R. M. HOSEA,
L. M. HOSEA.