2 Sheets--Sheet 1.

H. C. LOCKWOOD.

Coffee-Roasters.

No. 145,880. Patented Dec. 23, 1873.

Fig. 1.

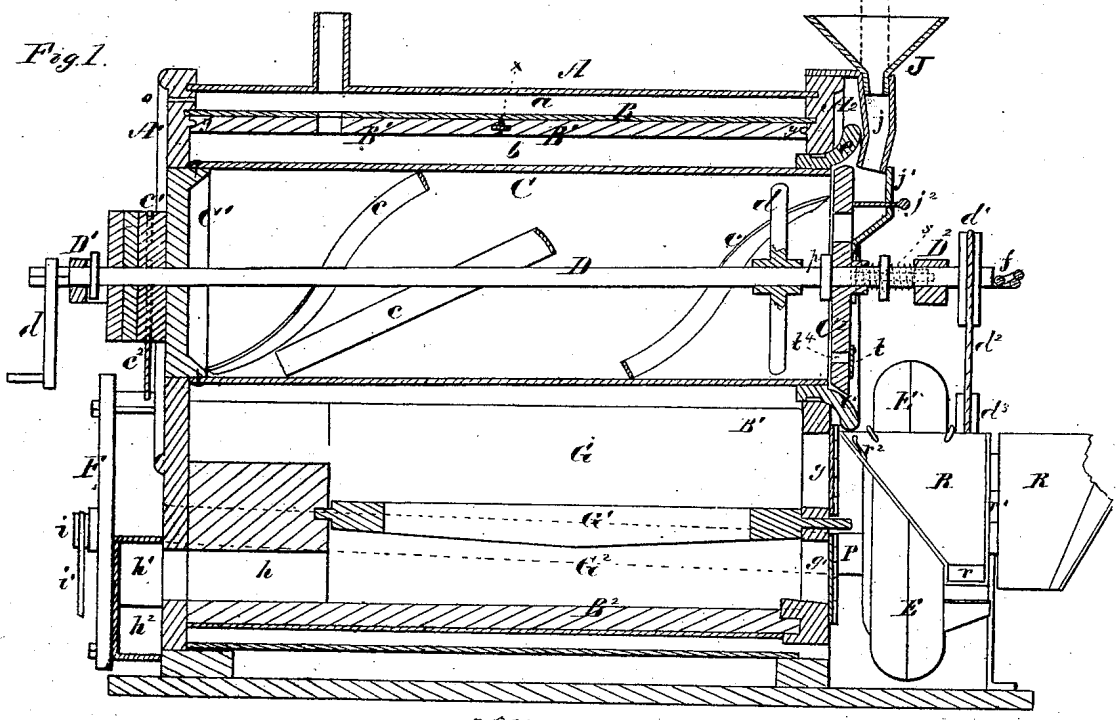
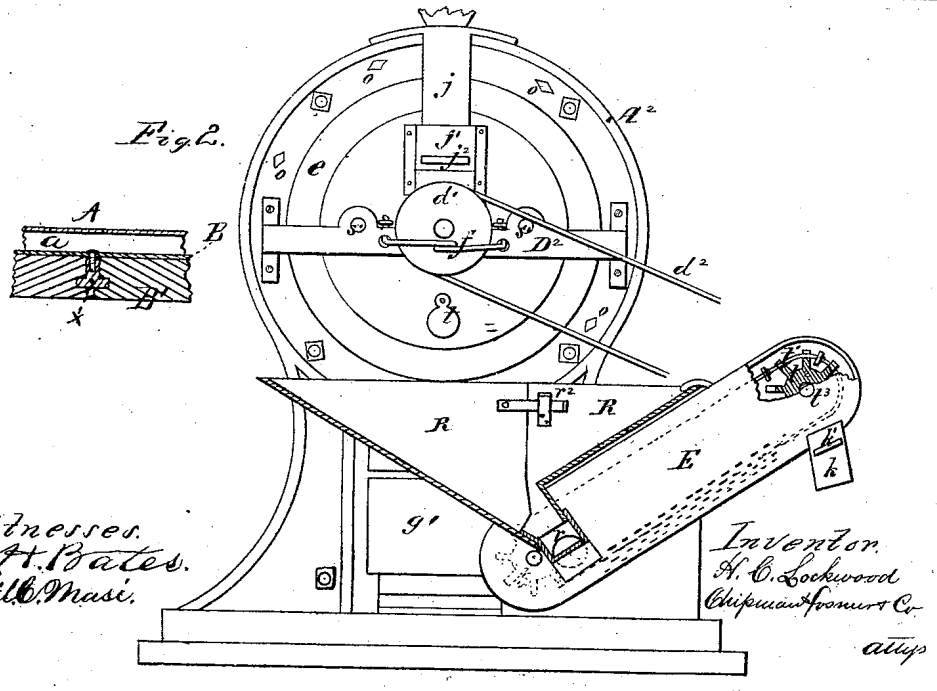


Fig. 2.



Witnesses.
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2 Sheets--Sheet 2.

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Fig. 3.

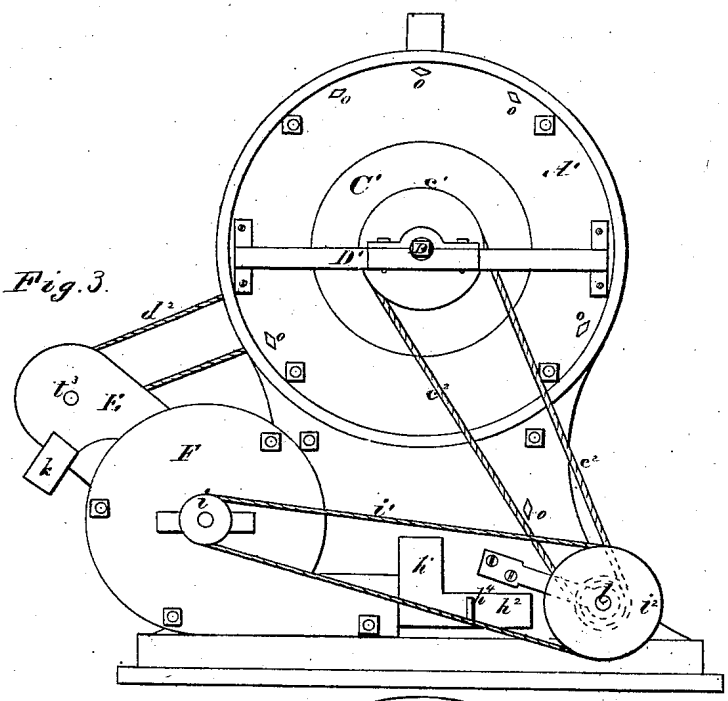


Fig. 5.

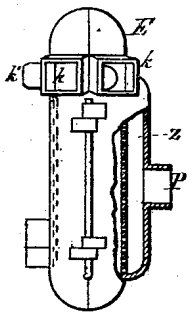
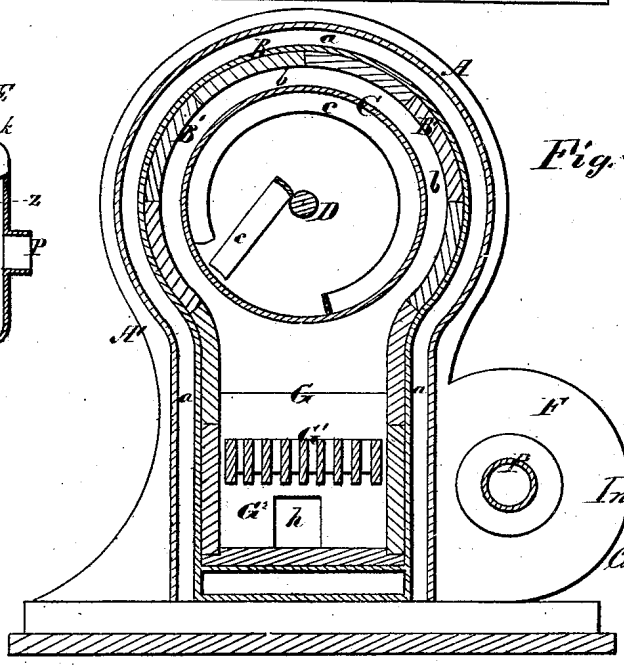


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY C. LOCKWOOD, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN COFFEE-ROASTERS.

Specification forming part of Letters Patent No. **145,880**, dated December 23, 1873; application filed September 13, 1873.

To all whom it may concern:

Be it known that I, HENRY C. LOCKWOOD, of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and valuable Improvement in Coffee-Roasters; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical longitudinal section of my coffee-roaster. Fig. 2 is an end view with part section. Fig. 3 is a rear view of my coffee-roaster. Fig. 4 is a vertical transverse section of same. Fig. 5 is a detail view of same.

My invention and improvements in coffee-roasting machinery relate, first, to a revolving roasting drum provided with a movable discharging-head, which is held in place by springs, and through which the coffee to be roasted is supplied to the roasting-drum; second, to a sectional hinged hopper, combined with an elevator and bag-fillers, arranged in relation to the discharging end of the roasting-drum; third, to means for cooling the coffee after it is discharged from the roasting-drum and while it is on its way through the elevator-trunk to the bag-fillers; fourth, to means for increasing the draft in the furnace and for regulating the same, combined with a perforated elevator-trunk and a pipe leading therefrom to a suction and blast fan, whereby the air which is drawn through this trunk for cooling the coffee is forced into the furnace beneath the grate; fifth, to a removable funnel, in combination with the discharging head of the roasting-drum and a stationary chute leading into the same; sixth, in providing a chute attached to the case adapted to receive an adjustable hopper opening into the removable head; seventh, in attaching a bail to the removable discharging head for drawing said head outward and arranging closing springs to restore said head to its original position.

In the accompanying drawings, A represents the outer case, which extends from the base of the machine over the top of the same, and forms, with an internal wall, B, an air-circulating space. The case A and the internal wall B are of sheet metal, and are sustained by two frame-heads, A^1 A^2, which are confined in place by long through-bolts. The inner wall B is lined with blocks of soap-stone B′ B′, or other suitable poor conductor of heat, which blocks are about half the length of the wall B, and are sustained by means of a central T-shaped rib, *x*, and ribs *y y* on the inner sides of the heads A^1 A^2, as shown in Figs. 1 and 4. The central rib *x* is secured to the inner side of the wall B, and the inner ends of the blocks B′ are grooved to receive the said rib *x*, while the outer ends of the blocks are grooved to receive the ribs *y*, as shown in Figs. 1 and 4. A door should be applied to the top of wall B to allow the introduction of the blocks B′. Within the space *b*, inclosed by the soap-stone-lined wall B, is arranged the roasting-drum C, inside of which spiral stirrers are applied, and below this drum are a fire-chamber, G, tilting-grate G^1, and ash-pit G^2. The fire-chamber is provided with a door, *g*, and the ash-pit with a door, *g′*. The roasting-drum C is provided with two heads, C^1 C^2, and is supported by a horizontal shaft, D, which passes through said heads, and through a spider, *d*, and has its bearings in brackets D^1 D^2, which are secured to the outer sides of the frame-heads A^1 A^2. The head C^1 is keyed on the shaft D, and turns with the roasting-drum C; but the head C^2 does not turn with this shaft, as it is held by two rods, *s′ s′*, which pass freely through the bracket D^2 on opposite sides of the shaft D, and have springs *s s* coiled around them, which press the head C^2 against a collar, *p*, on the shaft D, and thus close this end of the roasting-drum C within a space which is surrounded by a flaring spout, *e*, fast on the end of drum C. By means of a bail, *f*, which is attached to head C^2, and which passes through the bracket D^2, this head can be moved back and the roasted coffee discharged from the drum C into a receptacle, R. Below the shaft D a testing-hole, t^4, is made through the movable head C^2, which is closed by a pivoted cover, *t*, and above the shaft D a charging-spout, j^1, provided with a valve, j^2, is secured to the head C^2, above which spout is a stationary chute, *j*, and a removable funnel, J. To the stationary chute *j* (when the funnel is re-

moved) is attached a series of connecting-pipes, as indicated on the drawings by dotted lines, communicating with the floors above the machine. By this connection coffee may be fed or conveyed to the roaster from any of the floors. The funnel J will in practice be located in a room above the machine, and when the roasting-drum is not being charged with coffee this funnel can be moved out of the way. R represents a hopper, which receives the roasted coffee as it is discharged from the drum C, and which discharges the coffee through an opening, *r*, at the lower end of an inclined elevator-trunk, E. This hopper is arranged in front of the furnace and ash-pit doors, and in order to obtain access to them I make this hopper of two sections, and hinge one section to the other at r^1, and use a latch, r^2, for holding the movable section in its place. The elevator-trunk E is applied to the stationary section of the hopper R, and inside of this trunk is an endless belt of buckets, t^1, on the shaft of one of which a pulley, d^3, is keyed that receives rotation from a pulley, d^1, on shaft D by means of a belt, d^2. The buckets, which should be scoop-shaped, elevate the coffee to a proper height, and deliver it from the upper end of the trunk E through one or the other of two diverging tubes *k k*, which are adapted to receive on their ends the open ends of the bags for receiving the coffee. One of the tubes or bag-fillers *k* has a valve, *k'*, applied to it for cutting off the flow of coffee through it when desired. By means of these two filling-tubes bags can be filled one after the other as rapidly as the coffee is elevated in the trunk. The trunk E, which is preferably elliptical in cross-section, is thickly perforated, and on one side of it a box, *z*, is applied, from which a pipe, P, is carried to a fan-case, F. Air can thus be forcibly drawn through the entire perforated surfaces of the trunk E without carrying off any of the roasted grains. The object of drawing air through the trunk E is to cool the coffee or greatly reduce its temperature before it is discharged into bags. Inside of the fan-case F is applied a suitable fan, which receives rapid rotation from a pulley, c^1, on the shaft D, through the medium of the pulleys *i* i^2 and belts c^2 i^1, shown in Fig. 3, and a small pulley on shaft *l*, which is indicated by dots. The spout h^2 of the fan-case communicates with the ash-pit G^2 by means of a branch, h^1, and a passage, *h*, and to the spout h^2 a regulating-valve, h^4, is applied. The outer end of the spout is open, so that by adjusting the valve h^4 more or less of the heated air can be forced through the grate G^1 into the fire-chamber G.

It will be seen from the above description, first, that the roasting-drum is inclosed by a soap-stone wall, B', between which and the outer casing A is an air-space, *a*, which is in communication with the external air by means of inlets at its bottom and outlets *o o* through the frame-heads A^1 A^2. This allows a free circulation of air in said space and keeps the casing A comparatively cool, and while this is the case the soap-stone or its equivalent prevents any considerable radiation of heat, and at the same time equalizes the heat in the space *b*. Second, that the roasting-drum is provided with an annular discharging-spout and an endwise movable discharging-head, through which latter is a small hole for allowing grains of coffee to be raked out of the drum for testing them. Third, that the funnel or hopper through which the coffee is fed into the roasting-drum is removable. Fourth, that the roasted coffee is conveyed directly from a hopper and discharged into bags, and that it is cooled before it is discharged, and the heated air drawn from it is forced in regulated quantities into the furnace-chamber to facilitate combustion therein.

By having the funnel J removable the machine can be charged with coffee either from a room above that in which the machine is located, or by removing the funnel the charging can be done in the same room in which the machine is arranged.

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

1. The roasting-drum C, provided with an endwise movable discharging-head, C^2, which is held in place against a collar, *p*, on shaft D, by springs *s* on supporting-rods *s'*, substantially as described.

2. The hinged sectional hopper R arranged below the discharging end of the roasting-drum C, and in front of the furnace and ash-pit doors, as and for the purpose described.

3. The inclined perforated trunk E with its endless belt of buckets t^1 and diverging tubes *k* combined with the receiving-hopper R, substantially as specified.

4. The perforated elevator-trunk E communicating with a fan-case, F, by means of a pipe, P, and constructed with an air-box, *z*, on one side, substantially as and for the purpose described.

5. The open fan-spout h^2 communicating with the space beneath the fire-chamber, in combination with a pipe, P, leading from an elevator-trunk, E, substantially as and for the purposes described.

6. In a coffee-roasting machine, the chute *j* attached to the case A, adapted to receive the removable adjustable hopper J, and opening into the charging-spout *j'* upon the movable head C^2, substantially as and for the purpose specified.

7. The bail *f*, combined with the endwise movable discharging-head C^2 and closing springs *s*, as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

HENRY C. LOCKWOOD.

Witnesses:

PHIL C. MASI,

D. D. KANE.