(No Model.) 3 Sheets—Sheet 1.

W. W. DUNN.

APPARATUS FOR GRAIN DRYING AND COFFEE ROASTING.

No. 284,728. Patented Sept. 11, 1883.

Fig. 1.

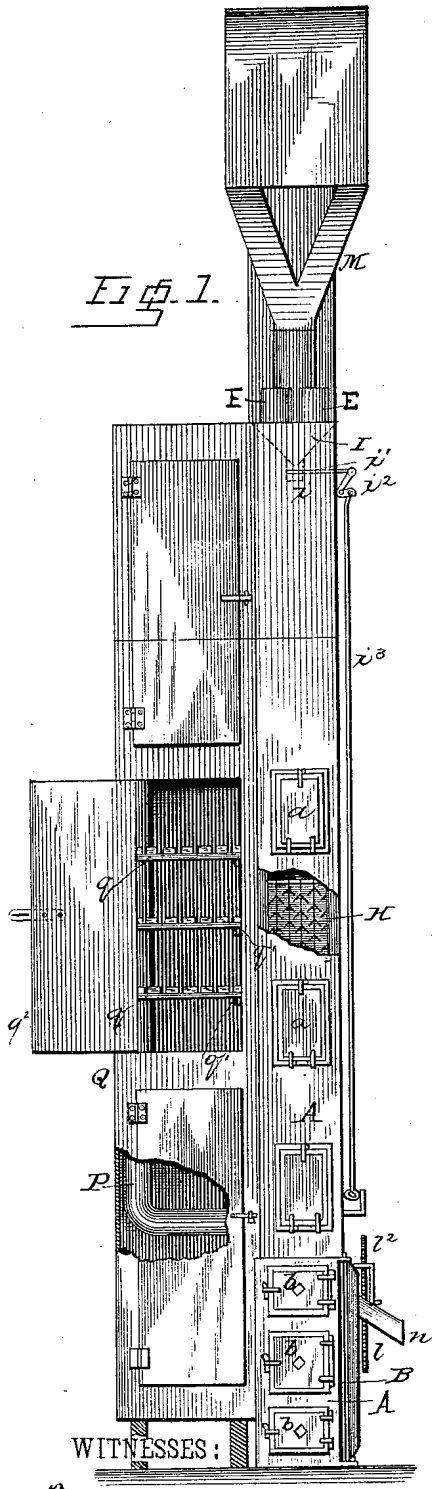
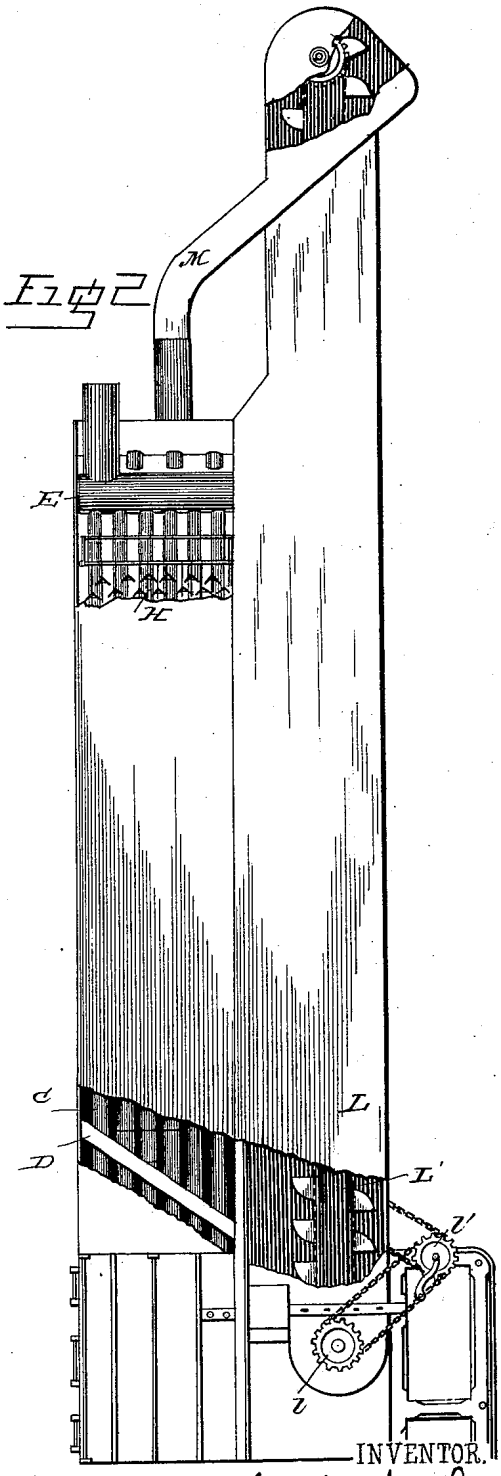


Fig 2



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 3

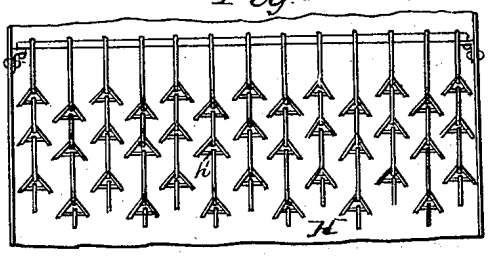


Fig. 5

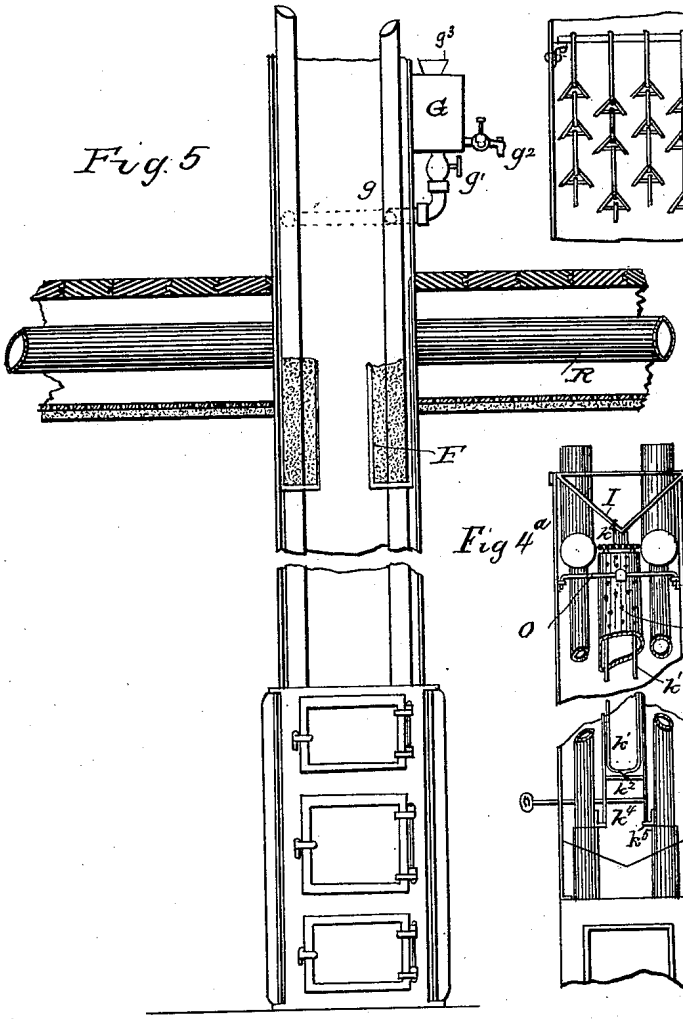


Fig. 4

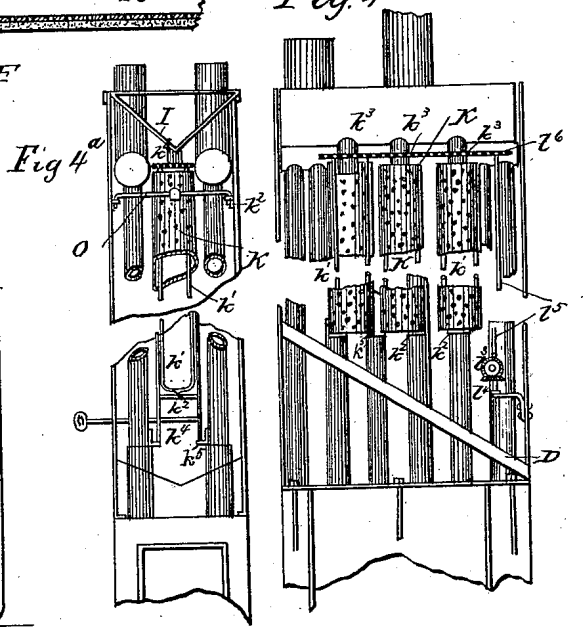


Fig. 4a

Fig. 3a

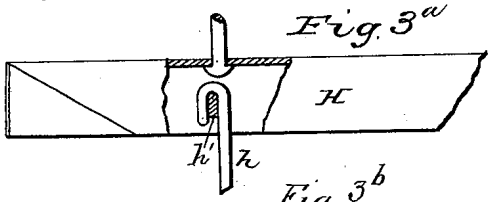
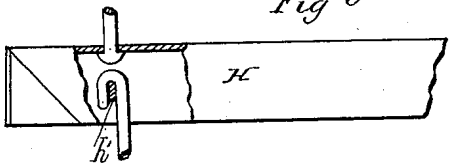


Fig. 3b



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(No Model.) 3 Sheets—Sheet 3.

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APPARATUS FOR GRAIN DRYING AND COFFEE ROASTING.

No. 284,728. Patented Sept. 11, 1883.

Fig 7.

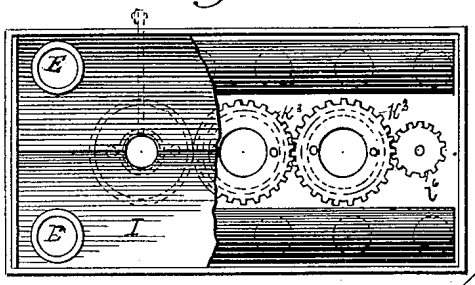

Fig. 6

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UNITED STATES PATENT OFFICE.

WILLIAM W. DUNN, OF FORT WORTH, TEXAS.

APPARATUS FOR GRAIN-DRYING AND COFFEE-ROASTING.

SPECIFICATION forming part of Letters Patent No. 284,728, dated September 11, 1883.

Application filed February 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WASHINGTON DUNN, a citizen of the United States, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Grain-Drying and Coffee-Roasting Apparatus, of which the following is a full, clear, and exact description.

The object of my invention is to construct an apparatus in which grain or fruit may be dried, coffee roasted, and the water evaporated from sugar and other like products.

My invention consists in the hereinafter-described means of attaining said object.

In the drawings, Figure 1 represents a front elevation of my improved apparatus, with parts broken away to show the construction; Fig. 2, a side elevation of the same; Figs. 3, 3^a, and 3^b, detail views of the retarders; Figs. 4 and 4^a, detail views of the coffee-roaster; Fig. 5, other details of construction. Fig. 6 is a broken elevation, showing the coffee-parchers and their actuating mechanism. Fig. 7 is a detail top view of the parching apparatus and the hopper.

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

A represents the casing of the heating-chamber, and extends through the different stories of the factory in which said apparatus is erected. Situated at the lower end of said casing is the furnace B, said furnace being provided with doors *b*. Extending vertically upward from top of said furnace are the smoke and heat pipes C, said pipes passing through the angular discharging-plate D and upward to the top of the apparatus, where they connect with the smoke stack or vents E. At intervals along the interior of the heating-chamber are sand-boxes F, by which the heat is more effectually retained within said chamber. On the outside of the casing A, above each sand-box, are situated water-tanks G, said tanks connected with interior of the chamber by pipes *g*, having cocks *g'* and g^2 and openings g^3 for the introduction of water. Situated in the spaces between the pipes C are the retarders H. The retarders are Λ-shaped in cross-section, provided with cross-pieces *h'*, and are connected by loose joints with rods *h*, said rods having their lower ends secured to the upper parts or ridges of the retarders, and their upper ends hooked over the aforesaid cross-pieces *h'*, thus allowing the retarders a horizontal swinging movement as the grain falls upon them. The retarders of each alternate vertical row lie in similar vertical planes; but in adjoining rows they are on different horizontal planes. These retarders extend from the bottom to near the top of the heating-chamber. Above the retarders is the receiving-hopper I, provided at its lower end with feed-pipes *i*. The latter may be closed by a valve, *i'*, connected with the lower part of the apparatus by an elbow-lever, i^2, and hand-rod i^3.

When it is desired to parch coffee, the retarders are removed from the drying-chamber and the removable pipes K are inserted in their stead. Said pipes K have perforated sides, and are supported by brackets k^5, attached to the pipes C. Within each of said pipes are U-shaped rods *k'*, supported on rests k^2. The tops of said rods are secured to and said rods are rotated by pinions k^3, and the latter are actuated in the manner hereinafter described. Near the bottom of each pipe is the cut-off slide k^4, by means of which the escape of the coffee from the pipes may be retarded or altogether stopped. Said pipes, rods, and pinions are removable from the heating-chamber.

The casing A is provided at different elevations with doors *a*, by which the operator is enabled to effect entrance to the interior of the heating-chamber for various purposes. At one side of casing A is a second casing, L, containing the elevator L' of the apparatus. Said elevator consists of a series of buckets attached to an endless band, said band passing over and under drums situated in the upper and lower parts of the casing L. The axle of the lower drum is provided (on the outside of the casing) with a tooth-wheel, *l*, and this wheel is revolved by a chain passing around it and another similar wheel, *l'*, attached to the driving-shaft of the apparatus. Another chain connects said driving-wheel *l'* with a wheel, l^2, journaled in the casing A, the shaft of which bears upon its inner end a bevel-pinion, l^3, the latter gearing with a like pinion, l^4, which is borne by a shaft, l^5, having bearings secured to the interior of the casing. Upon the upper extremity of said shaft l^5 is a wheel, l^6, gearing

with the wheels which revolve rods k'. By this construction it will be seen that the coffee, &c., may be passed upward by the elevator into the parching-pipes, and the rods in said pipes revolved by the action of the same driving-shaft.

The top of the elevator and the hopper I are connected by a chute-pipe, M, by which the article to be operated upon is passed from the elevator to the hopper. Connected with the discharging-plate D, near the bottom of casing A, is a discharge-spout, n, which passes through the elevator-casing and opens upon the outside of same. Said spout is constructed in two sections, as fully described in my former patent, No. 266,790, of October 31, 1882, and empties either within or outside of the elevator. Situated upon another side of the casing A is a third casing, Q, through which heat-pipes P, connected with the furnace, run and connect at their upper ends with the aforesaid smoke-stack.

Arranged at intervals through the casing Q are horizontal shelves q, upon which fruit is placed to be dried. These shelves are supported on brackets q', secured to the interior of the casing. Doors q^2 are constructed in said casing for the introduction of the drying-shelves and fruit.

For purposes of economy and convenience the building in which the apparatus is erected may be heated at any desired time by pipes R, opening in the casing A, just above the sand-boxes. Said pipes may conduct the warm air from said casing to the various apartments, and the hot air may be moistened by water dropped from tanks upon the sand in the boxes.

The operation of my invention is as follows: A fire is kindled in the furnace B, and grain or other articles are introduced into the lower part of the elevator through a feed-box similar to that described in my former patent. Simultaneously with this introduction the driving-shaft is rotated, and the elevator carries said articles upward and empties them into the receiving-hopper. From thence they are fed to the drying-chamber with greater or less rapidity, as the cut-off slide of the hopper-opening is more or less withdrawn. From the hopper said grain passes into the pipes K, where it is agitated by the rotary rods, and from thence it falls upon the retarders. (Of course if the pipes and rods are removed this part of the operation is omitted.) The grain then falls from one retarder to another until it reaches the discharge-plate of the apparatus. From thence it is conducted through the discharge-pipe, either back into the elevator (in case it is not sufficiently dried or parched) or through the elevator into a receptacle placed on the outside of the apparatus. At the same time with the above operation fruit may be dried in the casing O by placing it upon the shelves therein contained.

Having thus described my invention, what I claim is—

1. In an apparatus for drying and parching grain and coffee, the combination of the retarders H, provided with cross-pieces h', and the rods h, having their lower ends secured to the tops of the retarders and their upper ends hooked over the cross-pieces h', substantially as and for the purposes described.

2. In a grain-drying and coffee-roasting apparatus, the combination of the perforated pipes K and U-shaped rods k', rests k^2, connected to the vertical heating-pipes within the casing, and pinions k^3, the latter connected with the driving-shaft in the manner and for the purposes described.

3. The combination, in a grain-drying and coffee-roasting apparatus, of the bracket-rest k^5, secured to pipes C within the casing, the removable pipes K, provided with perforations in their sides, and the cut-off slides k^4, substantially as described, whereby the article parched is held and discharged, for the purposes set forth.

WILLIAM WASHINGTON DUNN.

Witnesses:
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H. P. HARRISON.