(No Model.) 2 Sheets—Sheet 1.

L. BON.

APPARATUS FOR DRYING SUGAR CANE TRASH.

No. 435,792. Patented Sept. 2, 1890.

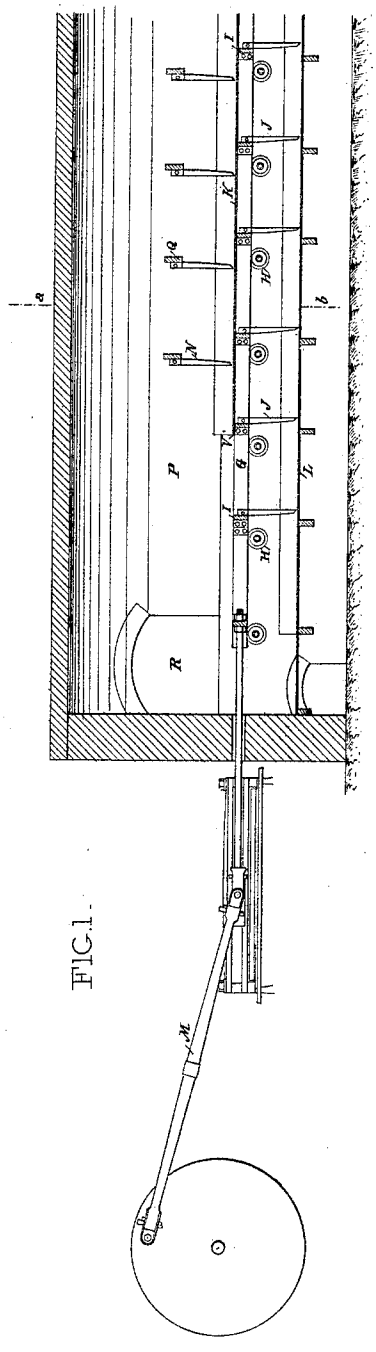


FIG. 1.

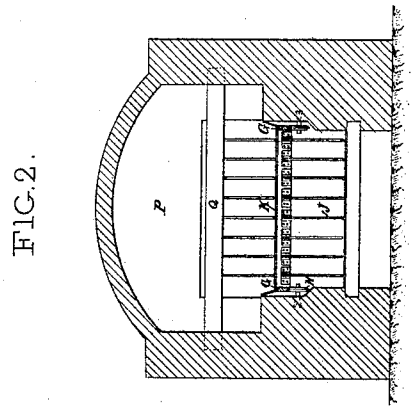


FIG. 2.

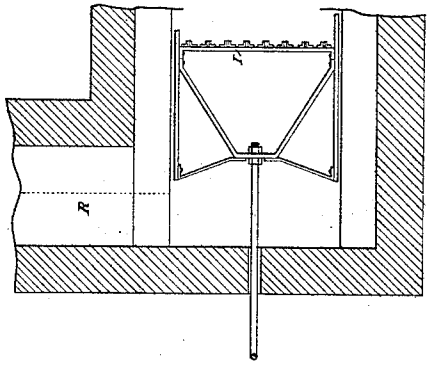


FIG. 3.

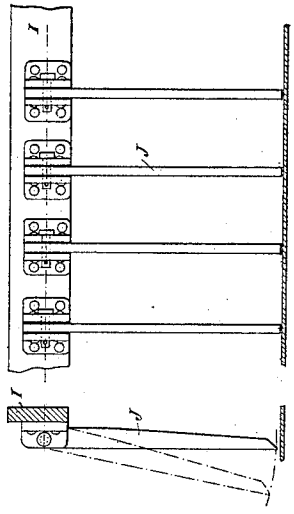


FIG. 5.

FIG. 4.

Witnesses:
Thomas Durant
E. D. Smith

Inventor
Leopold Bon.
By Church & Church
his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

L. BON.

APPARATUS FOR DRYING SUGAR CANE TRASH.

No. 435,792. Patented Sept. 2, 1890.

FIG. 6.

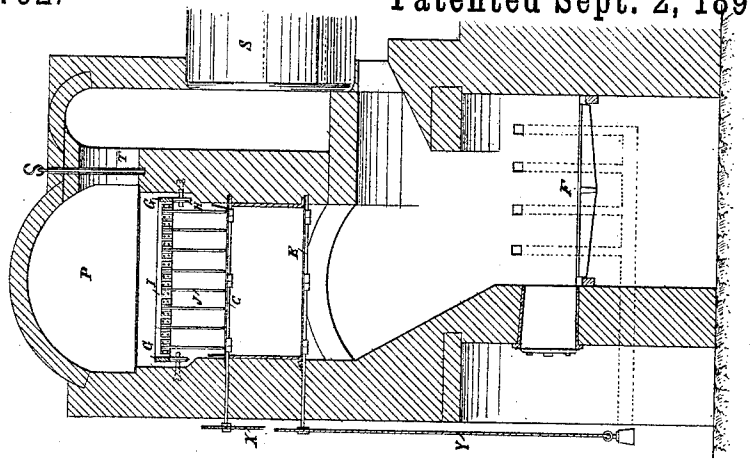


FIG. 1b.

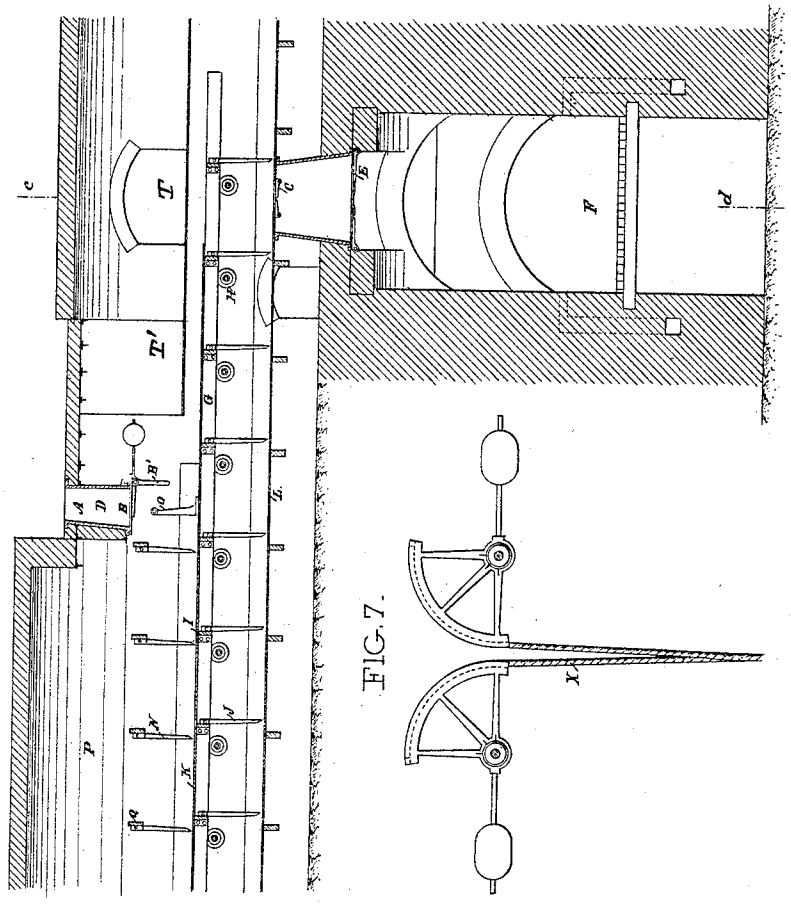


FIG. 7.

Witnesses
Thomas Durant.
E. N. Smith

Inventor
Leopold Bon.
By Church & Church
his Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

LEOPOLD BON, OF GUANTANAMO, CUBA.

APPARATUS FOR DRYING SUGAR-CANE TRASH.

SPECIFICATION forming part of Letters Patent No. 435,792, dated September 2, 1890.

Application filed April 11, 1890. Serial No. 347,462. (No model.) Patented in England March 26, 1890, No. 4,754.

To all whom it may concern:

Be it known that I, LEOPOLD BON, a citizen of the Republic of France, residing at Guantanamo, in Cuba, have invented certain new and useful Improvements in or relating to Apparatus for Drying Sugar-Cane Trash, (for which I have made application for Letters Patent of Great Britain, No. 4,754, dated March 26, 1890,) of which the following is a specification.

This invention relates to apparatus whereby green sugar-cane trash may be rapidly dried—that is to say, freed from moisture and thus made available for immediate use as fuel.

In the accompanying drawings, Figures 1 and 1ᵇ are longitudinal sections of the complete apparatus fitted within the furnace, the latter figure being a continuation of the former. Fig. 2 is a vertical section on the line *a b* of Fig. 1. Fig. 3 is a horizontal section of part of Fig. 1. Fig. 4 is a side view of one of the teeth of the "comb" or rack. Fig. 5 is a front view of one of the cross-pieces fitted with rack-teeth. Fig. 6 is a transverse section on the line *c d* of Fig. 1ᵇ, and Fig. 7 is a pair of weighted sectors enabling the traps through which the trash is to be allowed to fall to be opened by means of ropes.

The apparatus consists of a tunnel-shaped furnace P, with the furnace grate or hearth F at the back, while its front part is connected by a flue R to the chimney, through which escapes the steam given off by the material that is being dried.

Within the tunnel P, which, it will be noted, is enlarged to form an expansion-chamber for the moisture coming from the waste when under the influence of heat, there is an iron frame consisting of beams G, connected by means of cross-pieces I, each of which is provided with a certain number of pivoted teeth J, so arranged as to be capable of pivoting in one direction only, as shown in Fig. 4. Upon this frame a sheet of metal K is placed, having an opening at V. Rollers H, fixed to the walls of the tunnel, support the said framework, which, being operated by a connecting rod or link M, receiving motion from any suitable motor, is thereby caused to move backward and forward upon the rollers just mentioned. The metal sheet or plate K is provided with a projection or stop *o*, which at each stroke (as will be explained farther on) opens the weighted door B, which is arranged to prevent external air from entering the apparatus. Above the said frame fixed cross-pieces Q are arranged, being firmly fixed or built in the masonry, and having teeth N similar to the teeth J pivoted thereto, but so as to be capable of pivoting in the opposite direction. The metal sheet or plate L, placed directly underneath the frame, fulfills the office of a bed plate or floor. The apparatus is also fitted with a hopper A, through which the green trash to be dried is fed, and with a double set of doors or traps C E, which when open allow of the trash falling onto the grate or hearth at the same rate as it is dried, and passes through the channel or conduit D, while when closed the said doors permit the trash to be discharged through the end of the tunnel into a suitable collector or equivalent provided outside. The double set of doors it will be seen permit the trash to be discharged into the furnace without danger of setting the trash in the tunnel on fire.

The operation is as follows: The waste heat issuing from the hearth F, after having heated the boiler S of the plant, first passes through the pipe or conduit T, then flows through the tunnel P from end to end, and finally escapes through the flue R and a chimney connected therewith. The flow of gases or products of combustion entering the tunnel through the flue T in a direction to escape at the opening to the receptacle for the dried trash, is prevented by a shield or guard T′, which forms the bottom of the flue within the tunnel and lies in proximity to the movable platform or bed G up to a point near the entrance-chute. It will be further noted that the trash when dry enough to burn has reached a point below the floor K, where there is little or no likelihood of a spark reaching it, such as would set fire to the whole mass within the tunnel. When the apparatus is in operation, or, in other words, when the movable frame is reciprocated, the green trash is placed in the hopper A, and by the stop O acting on the lever-arm B′ the door B is opened and the trash falls onto the metal

plate K. As the frame moves to the left, as in Figs. 1 and 1b, the door B closes again under the action of its counter-weight, and the trash in raising the teeth of the first rack or comb above it takes up its position between that and the second comb or rack. When the frame moves back to the right, it receives a fresh batch of material to be dried, which, at the next stroke of the frame to the left, will in its turn enter the space between the first two racks while the preceding batch in raising the teeth of the second rack passes between this and the third rack. The operation may thus continue indefinitely, the succeeding batches of material to be dried always moving from one row of teeth to the following row at each stroke of the frame-work, and subsequently reaching the opening V in the plate K, through which opening it falls onto the floor L. It is there operated on by the lower racks or combs, which, acting in succession in the same manner as indicated above, cause the successive batches of trash to be moved toward the right, as in Figs. 1 and 1b, at the same time continually turning them round, so as to uniformly and thoroughly expose all parts thereof to the action of heat. The dried trash may finally be discharged and collected outside and conveniently stored up for use when required. When it is desired to use it in the hearth, it is only necessary to pull the ropes X Y, Figs. 6 and 7, attached to weighted sectors mounted on the same pivots as the doors C and E, which latter being thus opened enable any amount of dry material to fall directly into the fire.

I claim—

1. In an apparatus such as described, the combination, with the furnace and a flue for the products of combustion leading therefrom, of the drying-tunnel into which said flue opens, having an entrance-opening for trash, a discharge-opening leading to the furnace, with means for closing the same, and a second discharge for permitting the trash not discharged into the furnace to pass out of the tunnel, and means, substantially as described, for moving the trash through the tunnel from the entrance to the discharge openings, substantially as described.

2. In an apparatus such as described, the combination, with the furnace and flue T for the products of combustion therefrom, of the drying-tunnel having the central floor or plate K, above which the flue from the furnace enters, with a smoke-guard T′ extending from the flue T into proximity with said floor, said tunnel having an entrance-chute for trash in proximity to the flue T, and a discharge-opening for the trash at the same end below the floor K, a discharge for the products of combustion at the opposite end, and a conveyer for carrying the trash from the chute along above the floor K and returning the same to the discharge-opening below said floor, substantially as described.

3. In an apparatus such as described, the combination, with the furnace, drying-tunnel, and flues leading from the furnace to the tunnel, of the conveyer within the tunnel, and the entrance-chute for trash having the trip-door operated by the conveyer at predetermined intervals to admit a charge of trash, substantially as described.

4. In an apparatus such as described, the combination, with the furnace, drying-tunnel, and flues leading from the furnace to the tunnel, of the reciprocating conveyer within the tunnel, having the projection O thereon, the entrance-chute and the counterbalanced door closing the bottom of said chute having the projection adapted to be engaged by the projection on the conveyer to open the door and discharge a quantity of trash within the tunnel, substantially as described.

5. In an apparatus such as described, the combination, with the furnace, drying-tunnel, and flue leading from the furnace to the tunnel, said tunnel having a discharge-opening leading from the tunnel into the furnace, of a double set of doors with a space between the same located in said opening, whereby the trash may be discharged into the furnace without danger of setting the trash within the tunnel on fire, substantially as described.

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

LEOPOLD BON.

Witnesses:
LOUIS SULLEGER,
J. ROBELET.