C. P. BERCKHEMER.

Malt Dryer.

No. 109,105. Patented Nov. 8, 1870.

Fig. 1.

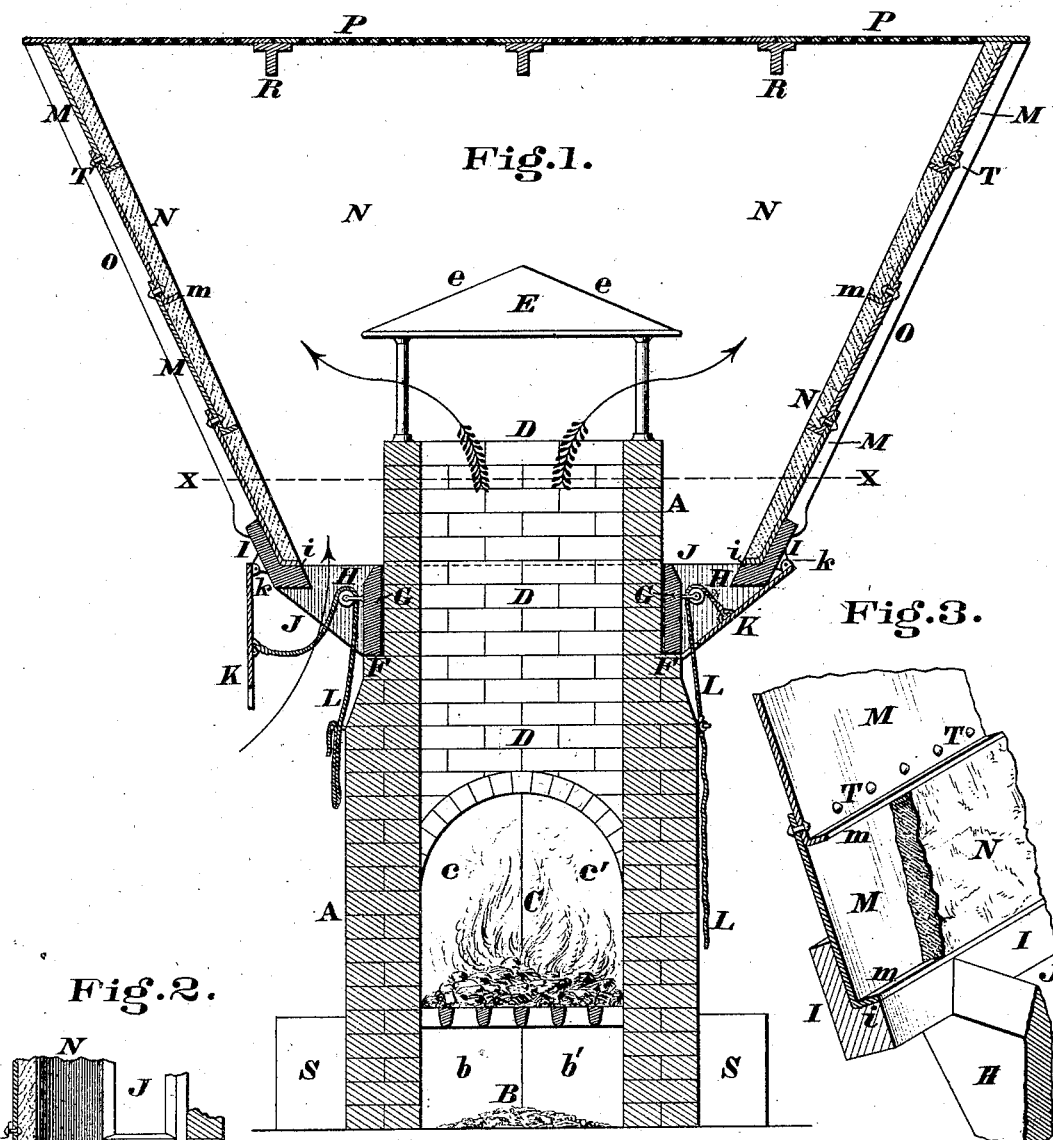
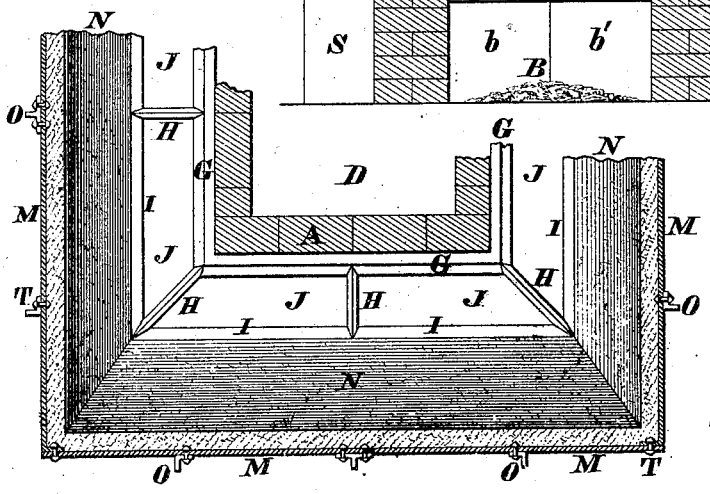


Fig. 3.

Fig. 2.



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CHARLES PHILIPP BERCKHEMER, OF CINCINNATI, OHIO.

Letters Patent No. 109,105, dated November 8, 1870.

IMPROVEMENT IN MALT-KILNS.

The Schedule referred to in these Letters Patent and making part of the same.

I, CHARLES PHILIPP BERCKHEMER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain Improvements in Malt-Kilns, of which the following is a specification.

Nature and Objects of the Invention.

This invention relates to that class of apparatus which is employed by brewers and maltsters for drying grain; and

The first part of my improvement consists in dispensing with the air-flues which are commonly located in the masonry on each side of the furnace proper, and which draw their supply of air from near the ground, where it is always damp and impure.

In my kiln, on the contrary, the air is admitted through suitable registers or dampers, which are elevated some distance above the ground, thereby insuring a supply of pure and dry air to the interior of the apparatus, by which means its efficiency is increased and the labor of attending it diminished.

The second part of my invention relates to that part of the kiln termed the hopper, which, surrounding the cupola, extends up to the perforated floor, and which serves to conduct the heated air to the grain that is to be dried; and

The improvement consists in constructing this part of the apparatus of metallic sheets or plates, having inwardly-projecting flanges for supporting a lining composed of cement, fire-clay, or some other suitable plastic material, which will prevent the radiation of heat.

General Description with Reference to the Drawing.

Figure 1 is a vertical section of a malt-kiln embodying my improvements, one of the registers for regulating the supply of air being represented open and the other closed.

Figure 2 is a section through a portion of the kiln taken at the line *x x*.

Figure 3 is a perspective view of a part of the metal casing or shell of the hopper, with a portion of the cement lining removed therefrom.

A represents the furnace or cupola, having the customary ash-pit B, fire-chamber C, and vertical flue D, up which the heat ascends from the fire in said chamber C.

The pit B and fire-chamber C are provided, respectively, with doors *b b'* and *c c'*, for the purpose of regulating the supply of air to the furnace, and to allow the replenishing of the fuel in the same.

Located a suitable distance above the upper end of flue D is the customary slab or lintel E, which compels the heated air arising from said flue to discharge itself laterally into the kiln, and not to take a direct central passage through the same.

The sloping top *e* of this slab or plate causes the deflection of "sprouts," which may fall through the perforated floor of the drying-room, and prevents them dropping into the mouth of the furnace.

The walls of the cupola, after being carried up a proper height, are diminished in thickness, so as to form a ledge, F, which serves as a foundation for a heavy casting or bed-plate, G, that surrounds the cupola on all four sides.

Projecting outwardly from this bed-plate are arms, H, for the support of a rim, I, having a shoulder, *i*, for a purpose which will presently appear.

Between the arms H are openings J, through which fresh air flows to the interior of the apparatus, and the supply is regulated by means of registers, K, which are hinged at *k* to the rim I.

The opening or closing of these registers is controlled by cords or chains L.

Resting upon the ledge *i*, and arranged so as to incline outwardly from the cupola, is a number of metallic plates, M, preferably of sheet-iron, whose lower edges are bent so as to form inwardly-projecting flanges, *m*, that serve to support a lining, N. This lining may be composed of cement, fire-clay, plaster of Paris, or any other suitable refractory material that is a non-conductor of heat and that can be applied in a plastic condition. This filling is cheap, readily applied, and is, in every respect, superior to the expensive and heavy brick-work lining which has heretofore been employed in this part of a malt-kiln.

The metallic jacket or shell M of the hopper, if preferred, may be stiffened by angle-iron ribs, O, that can extend from the top of rim I to the perforated floor P of the drying-room.

The sheet-metal plates composing the shell, together with their angle-iron ribs, are united by rivets T.

The floor P extends completely across the mouth of the kiln and rests upon beams R.

Bins or other receptacles, S, may be placed at the sides of the furnace for the purpose of receiving the sprouts which may be deflected from lintel E and fall through openings J, and suitable troughs may be arranged around the cupola for conducting the sprouts into said receptacles.

In all kilns which have heretofore been built it has been customary to locate the air-ducts in the walls of the cupola, thereby increasing the dimensions and cost of the same, and at the same time causing the kiln to occupy a large amount of valuable space, besides which, the openings that admitted air to said ducts were always situated near the ground, where the air is more or less impure.

It will be seen that the arrangement of air-openings J renders my kiln free from all these defects.

Another serious objection to the old-fashioned kiln

consists in the arrangement of heavy beams, wooden sheathing, and interior brick-lining, for which I have substituted the angle-iron ribs O, sheet-metal case M, and plastic filling N, thereby diminishing the weight, reducing the cost of construction, and rendering the kiln perfectly fire-proof.

If desired, doors can be made in the plates *m*, so as to afford access to the interior of the hopper for the purpose of inspecting and cleaning the same.

Claims.

I claim as new and of my invention—

1. A malt-kiln, having the external and elevated air-inlets J, which are closable by registers K, or their equivalents, substantially as herein described.

2. The combination of the sheet-metal case M M and plastic filling N, for the object herein set forth.

In testimony of which invention I hereunto set my hand.

CHARLES PHILIPP BERCKHEMER.

Witnesses:

GEO. H. KNIGHT.

JAMES H. LAYMAN.