

(No Model.)

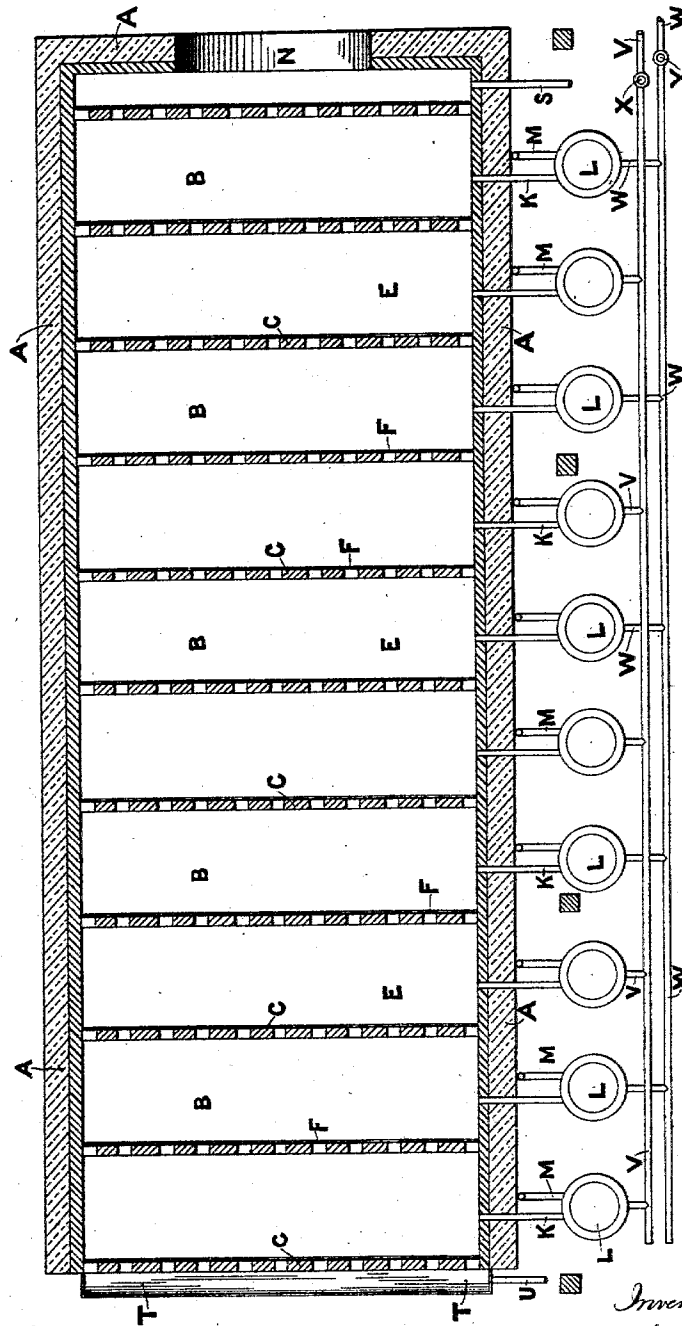
3 Sheets—Sheet 1.

W. McD. MACKEY.
APPARATUS FOR DRYING AIR.

No. 562,632.

Patented June 23, 1896.

—FIG. 1.—



Witness
Chas. N. Smith
J. Staib

Inventor
William M. Mackey
per Samuel W. Penell
Atty.

(No Model.)

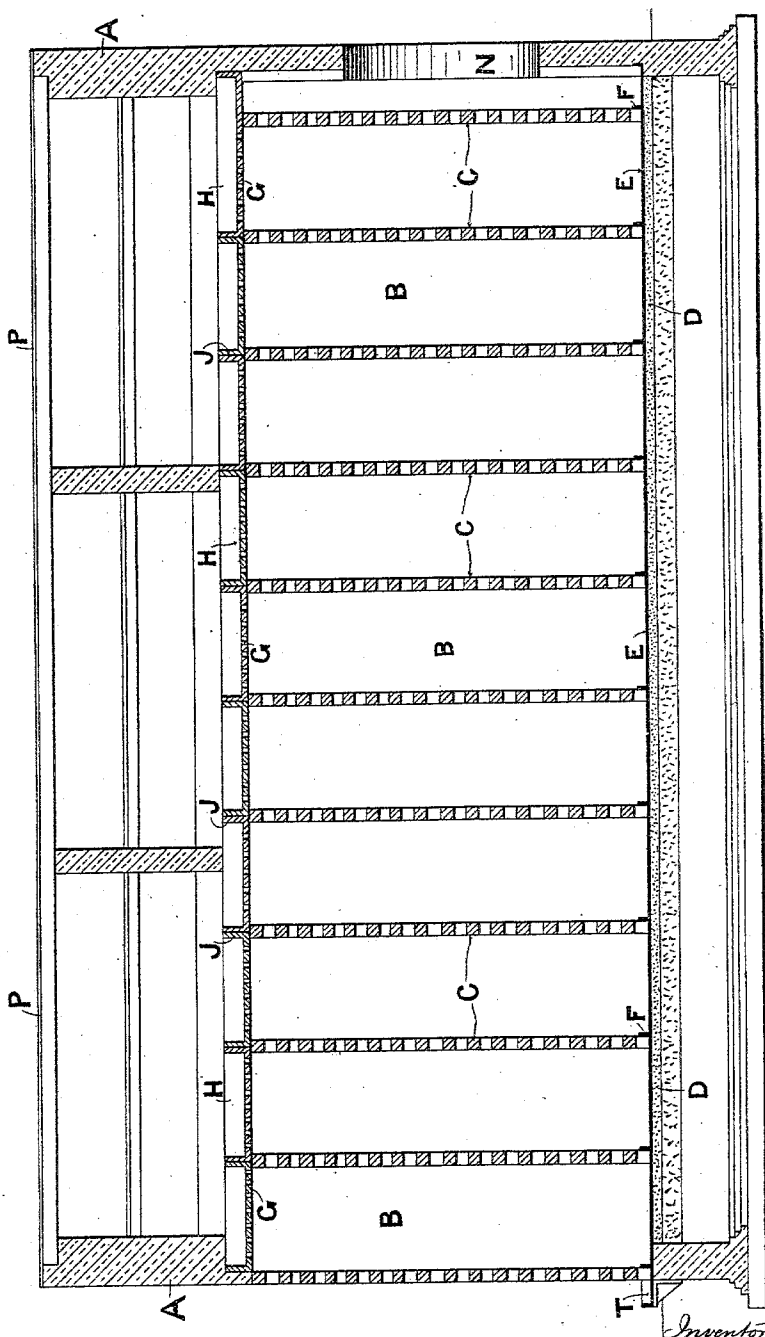
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W. McD. MACKEY.
APPARATUS FOR DRYING AIR.

No. 562,632.

Patented June 23, 1896.

FIG 2



Witnesses

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(No Model.)

3 Sheets—Sheet 3.

W. McD. MACKEY.
APPARATUS FOR DRYING AIR.

No. 562,632.

Patented June 23, 1896.

FIG-4-

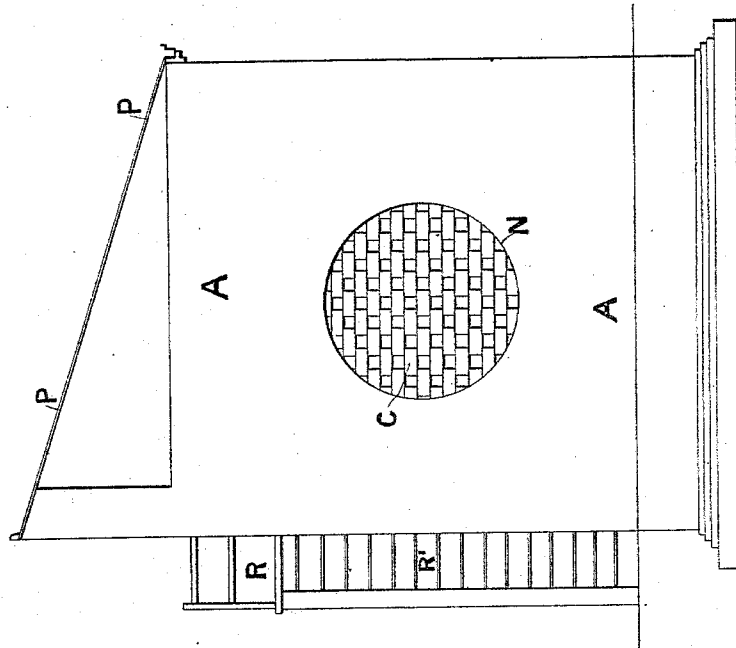
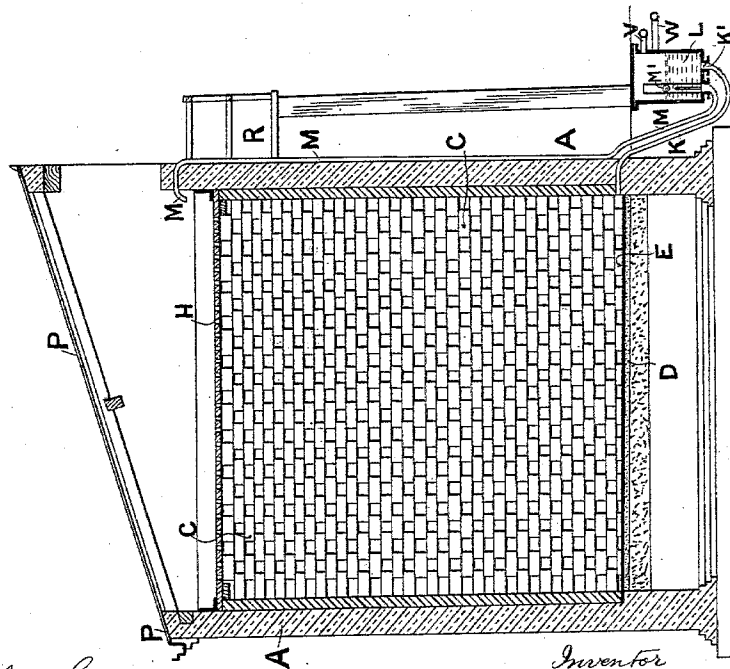


FIG-3-



Witnesses
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J. Stair

Inventor
William M. Mackey
per Lemuel W. Lowell
Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM McDONNELL MACKEY, OF LEEDS, ENGLAND.

APPARATUS FOR DRYING AIR.

SPECIFICATION forming part of Letters Patent No. 562,632, dated June 23, 1896.

Application filed December 26, 1895. Serial No. 573,303. (No model.) Patented in England October 23, 1895, No. 19,921.

To all whom it may concern:

Be it known that I, WILLIAM McDONNELL MACKEY, a subject of the Queen of Great Britain and Ireland, and a resident of Leeds, in the county of York, England, have invented certain new and useful Improvements in Apparatus for Drying Air, (for which I have obtained a patent in Great Britain, No. 19,921, bearing date October 23, 1895,) of which the following is a specification.

The object of this invention is to construct apparatus whereby large quantities of air may be effectually brought into contact with sulfuric acid, zinc chlorid, or other desiccating liquid, thereby absorbing the moisture in the said air and effectually drying same, and apparatus constructed as hereinafter described is especially suitable for drying air supplied to blast and other furnaces.

In the drawings, Figure 1 is a sectional plan, Fig. 2 is a longitudinal section, Fig. 3 is a cross-section, and Fig. 4 is an end view, of an apparatus constructed according to my invention.

Similar letters refer to like parts in all the figures.

According to my invention, I construct the apparatus in the form of a horizontal chamber, having an outer wall A, which may be composed of ordinary brickwork provided with an interior glazed lining. The said horizontal chamber is divided into compartments B, which are formed by the partitions C, constructed of brick checker-work. The floor of the chamber is composed of a concrete or other bed D, which, when sulfuric acid is used, may be covered with a layer of lead or other metal E, which is not affected by the desiccating liquid, and transverse ridges or lips F are provided at the lower ends of the partitions C, thus forming trays in the bases of the compartments B. Troughs H are provided on the upper part of the partitions C, and the said troughs are fitted with perforated floors G and impervious sides J.

K are pipes which lead from the bases of the compartments B to the lower portions of the wells L, and the said pipes K are provided with non-return valves K', which prevent the passage of liquid from the said wells to the lower portions of the compartments B.

M are pipes which lead from the lower ends

of the wells L up to the troughs H, and M' are float-valves which close the inlets to the pipes M when the wells contain no liquid, and the said wells are provided with covers which enable them to be hermetically closed to the outside air when required.

N is the outlet for the air passing through the apparatus, and P is a roof for protecting the structure when it is employed in the open air.

R is a gallery for facilitating the inspection of the troughs H, and steps R' are provided for giving access to the said gallery R.

S is a pipe for supplying fresh desiccating liquid, and a trough T is employed at the opposite end of the apparatus for receiving liquid which flows over the lip F of the outside compartment B, an overflow-pipe U being employed for the purpose of removing the liquid received in the said trough.

V and W are pipes which connect the upper ends of the wells L with a suitable compressed-air apparatus, (not shown in the drawings,) and the compressed air may be alternately supplied to alternate wells by intermittently turning the cocks X and Y on and off.

Coke or other loose material is filled into the compartments B, and on the apparatus being required for use, sulfuric acid or other suitable desiccating liquid is allowed to flow into the first tray by way of the pipe S. The desiccating liquid flows over the first lip F onto the tray of the first compartment B, and it then fills the well connected with the base of the said first compartment; it then overflows the second lip F and covers the base of the second compartment, at the same time filling the well connected with same, and the flow through the pipe S is allowed to continue until all the wells are full and the entire floor of the apparatus is covered with desiccating liquid. The apparatus is now ready for use. The cock X is now opened to the compressed-air supply, thus causing pressure to be made on the surface of the desiccating liquid contained in the set of wells to which the pipe V is connected, and the pressure thus given forces the liquid up the pipes M to the troughs H, through which the said liquid flows onto the coke, and down to the bases of the compartments B. The cock X is now turned off, and the cock Y is opened, thus causing the liquid

in the other set of wells to be forced up to the troughs H and to run down in a similar manner. The non-return valves K' prevent the liquid returning to the bases of the compartments B, and the float-valves M' close the pipes M on the liquid being exhausted from the wells, thus effectually preventing the escape of the pressure from a single well, as might be the case when the desiccating liquid is of varying specific gravity in the different wells L.

The cocks X and Y may be intermittently opened and closed either by hand or by suitable mechanical means, thus causing the desiccating liquid to be continually descending in finely-divided streams through the coke in the compartments B, and the continual supply of fresh desiccating liquid through the pipe S gradually feeds the said liquid toward the end of the apparatus, where it is received by the trough T and passes off by the overflow-pipe U.

The air to be dried is drawn through the apparatus to the outlet N, and in its passage through the compartments B it is in continual contact with the finely-divided desiccating liquid passing through the coke, thus enabling the said liquid to absorb the moisture contained in the air. In this manner the air to be dried is first brought into contact with the desiccating liquid which has already traveled through the apparatus, and which is consequently partly charged with moisture, and as the said air travels along it comes in contact with desiccating liquid in a drier state, until finally it comes into contact with the liquid which has freshly entered the apparatus, where it becomes completely dried before leaving the outlet.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for drying air, composed of a horizontal chamber divided into compartments by means of brick checker-work, the up-

per parts of the compartments being covered by perforated troughs which are provided with a supply of desiccating liquid, the said liquid descending through the trays onto coke or other loose material contained in the compartments, thus producing fine streams of desiccating liquid which absorb moisture from the air passing through the apparatus thereby drying same, substantially as set forth.

2. An apparatus for drying air, composed of a horizontal chamber divided into compartments by means of brick checker-work, the upper parts of the compartments being covered by perforated troughs, in combination with wells connected with the bases of the compartments by suitable pipes having non-return valves in same, and other pipes provided with float-valves connecting the bases of the wells to the said troughs, the wells being provided with pipes connected with suitable compressed-air apparatus, substantially as set forth.

3. An apparatus for drying air, composed of a horizontal chamber divided into compartments by means of brick checker-work, the bases of the compartments forming trays by means of the lips F, the said compartments being filled with coke or other loose material and being covered by perforated trays, in combination with wells connected with the bases of the compartments by suitable pipes having non-return valves in same, and other pipes provided with float-valves connecting the bases of the wells with the troughs, the wells being divided into two sets and being connected with a compressed-air apparatus by separate pipes, cocks being provided in the said pipes so that the wells may be set in action alternately, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILLIAM McDONNELL MACKAY.

Witnesses:

GRIFFITH BREWER,
JAMES SNODGRASS.