(No Model.)

2 Sheets—Sheet 1.

A. S. TOMKINS, F. M. COURAGE & F. A. CRACKNALL.

GRAIN DRIER.

No. 308,291. Patented Nov. 18, 1884.

Fig. 2.

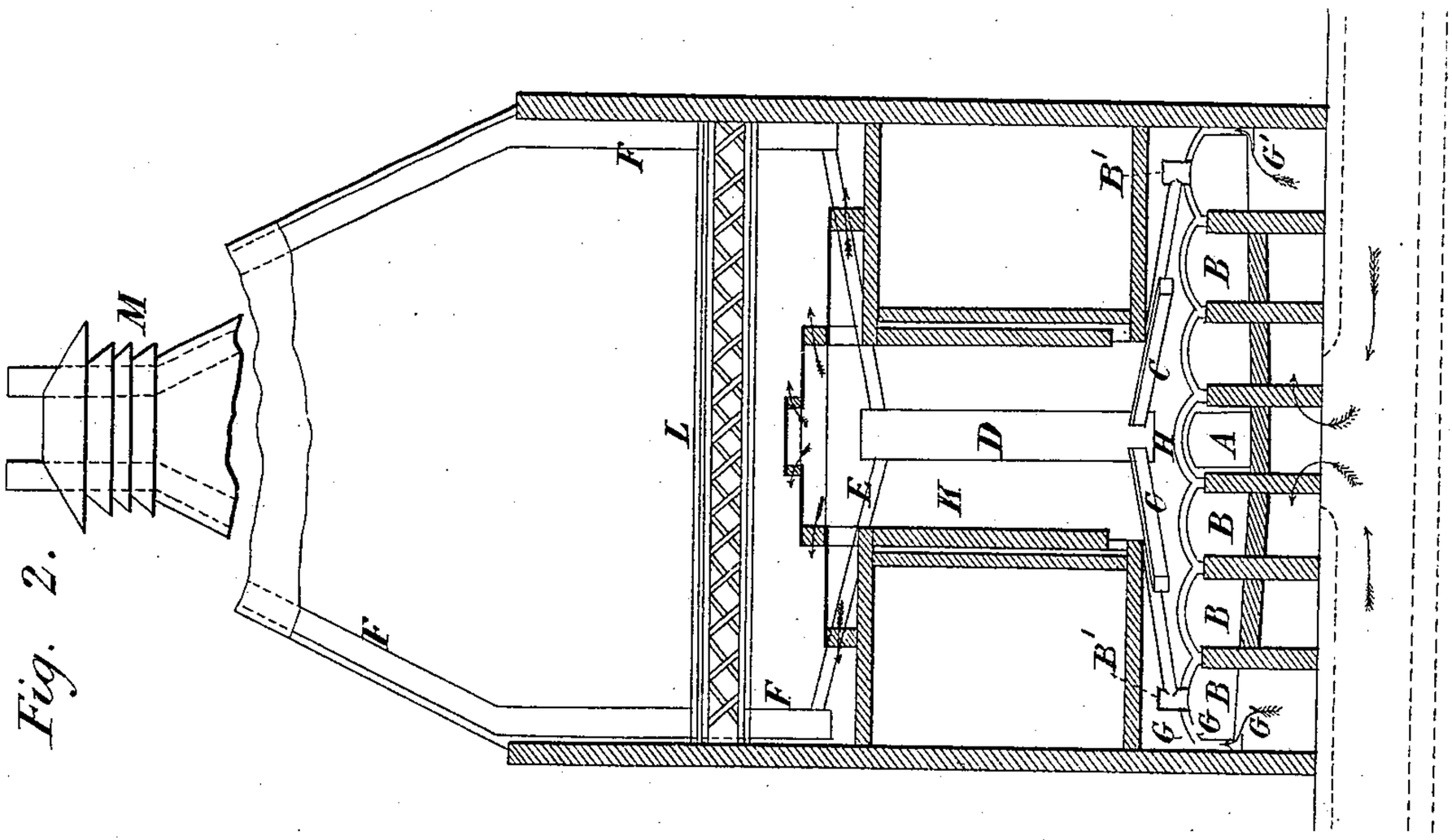
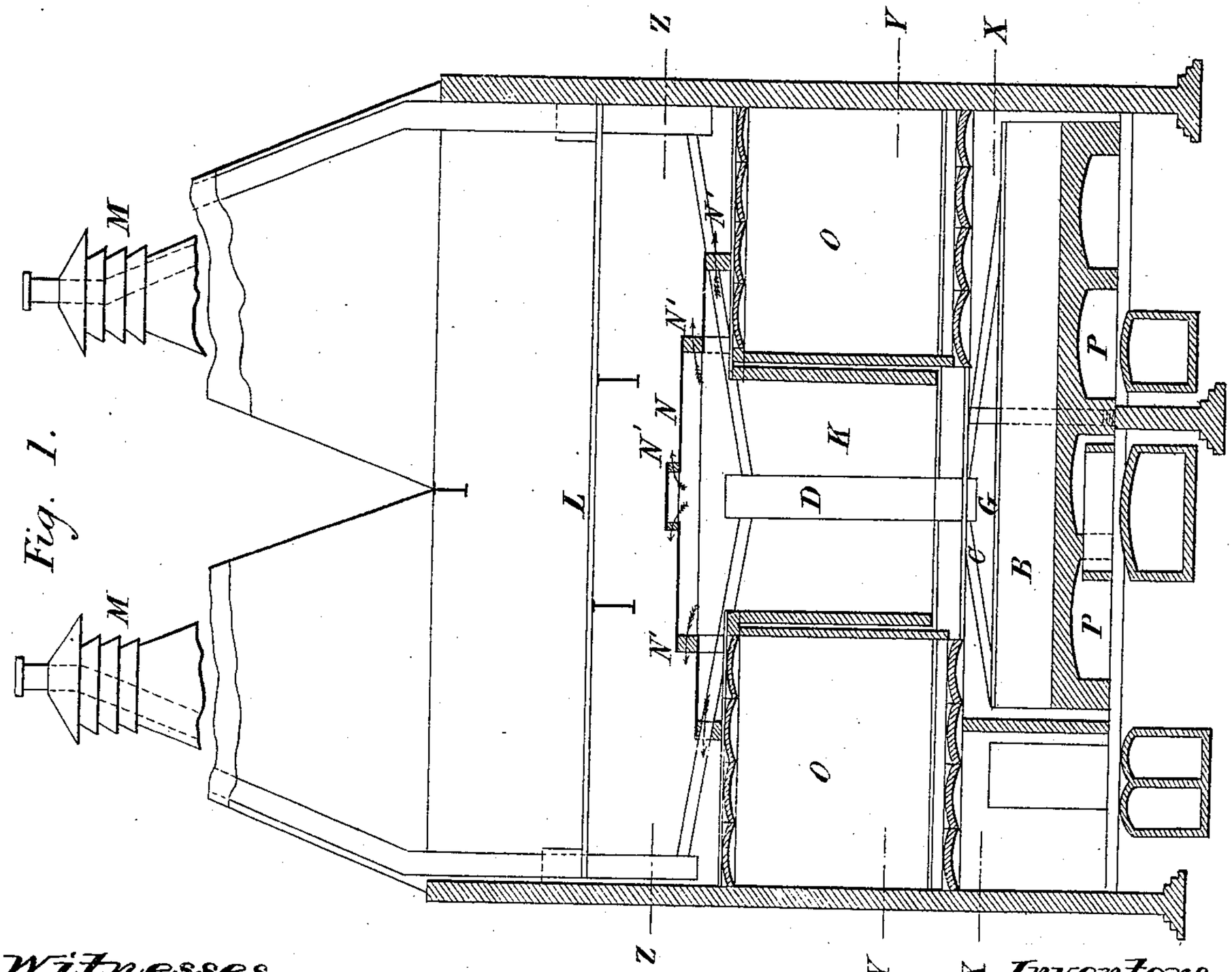


Fig. 1.



Witnesses.
Alf. Norris.
Robert Everett.

Inventors.
A. S. Tomkins.
F. M. Courage.
and F. A. Cracknall.
By James L. Norris. Atty

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Fig. 3.

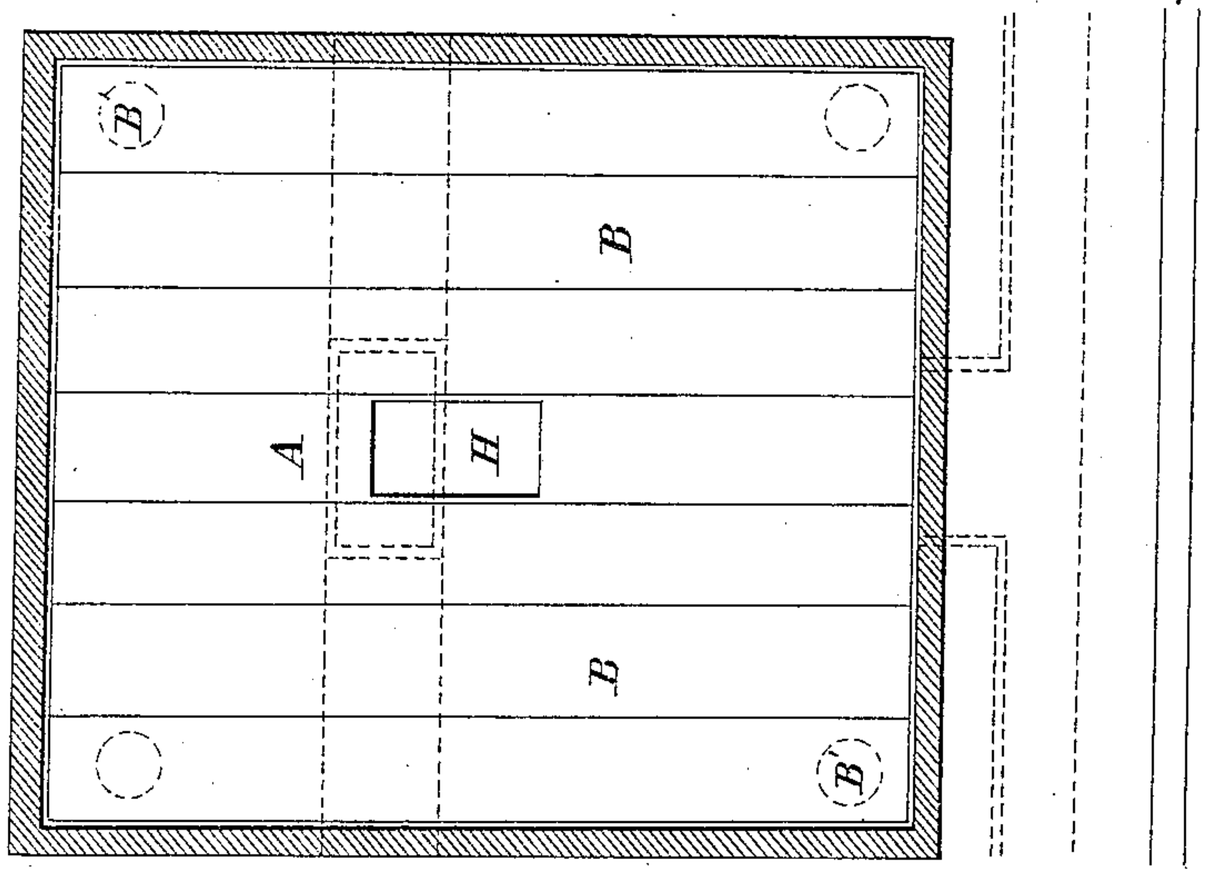


Fig. 5.

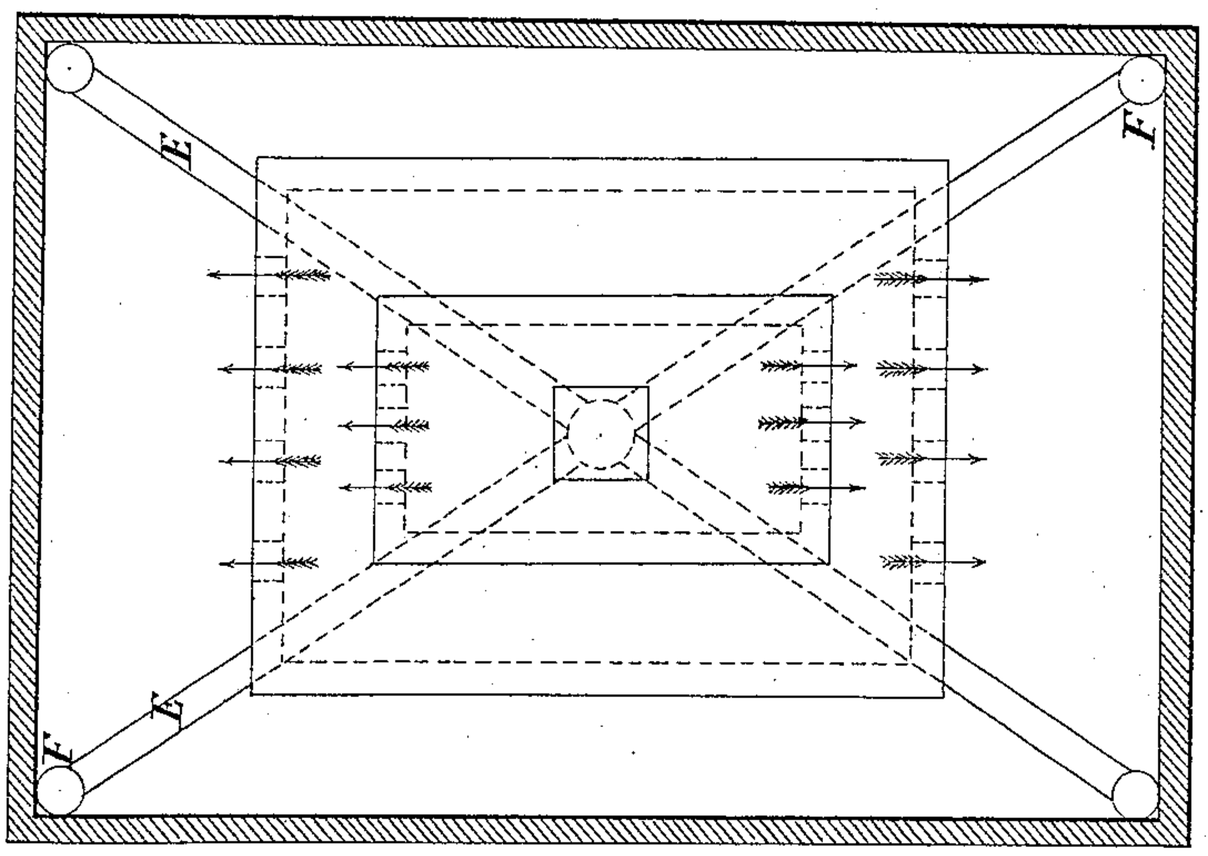
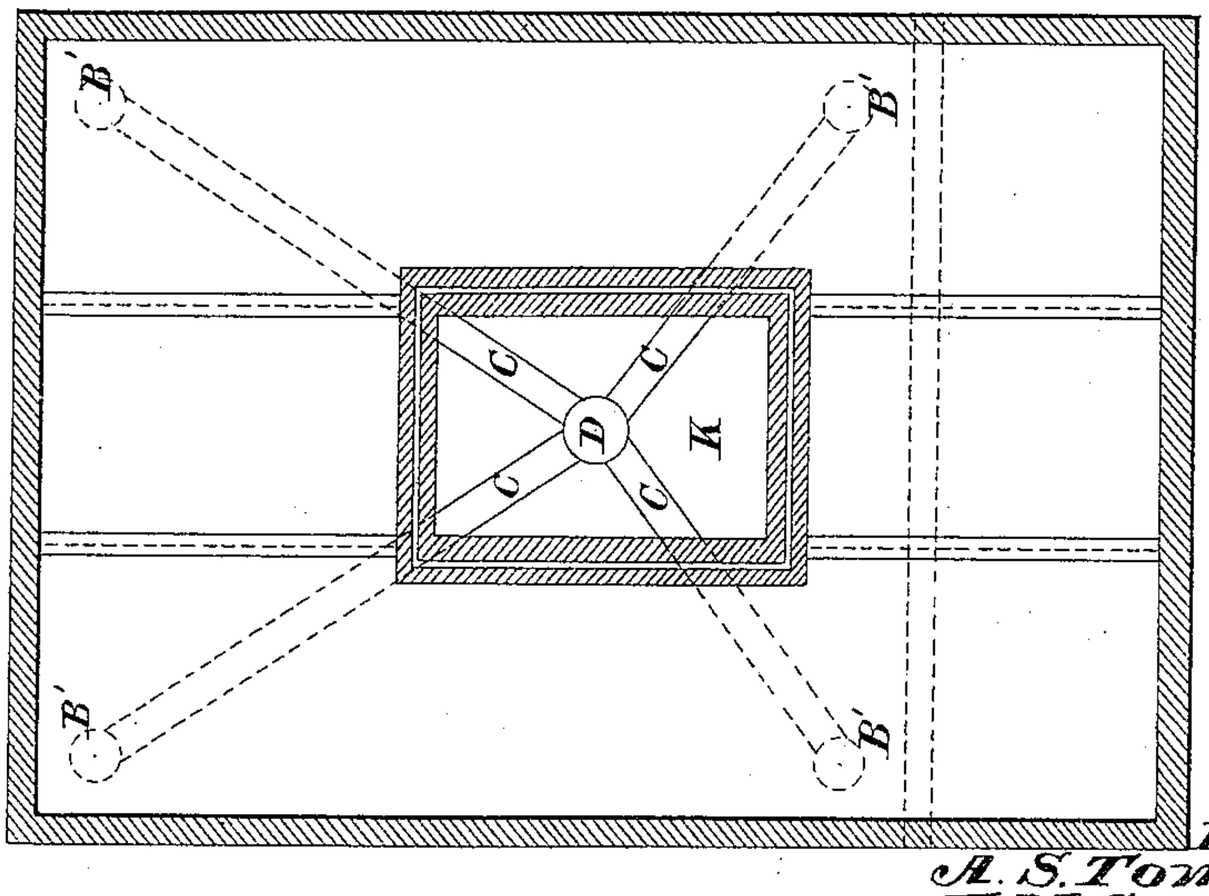


Fig. 4.



Witnesses.
A. H. Norris.
Robt Everett.

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A. S. Tomkins,
F. M. Courage,
F. A. Cracknall.
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UNITED STATES PATENT OFFICE.

ALFRED SAVILL TOMKINS, FREDERIC M. COURAGE, AND FRANK. A. CRACKNALL, OF LONDON, ENGLAND.

GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 308,291, dated November 18, 1884.

Application filed May 7, 1884. (No model.) Patented in England February 7, 1881, No. 509.

To all whom it may concern:

Be it known that we, ALFRED SAVILL TOMKINS, FREDERIC MICHELL COURAGE, and FRANK. ARTHUR CRACKNALL, citizens of England, all residing at 61 Mark Lane, in the city of London, England, malt factors, have invented an Improvement in Kilns for Drying Malt, Grain, or other Materials, (for which we have obtained a patent in Great Britain, No. 509, bearing date February 7, 1881,) of which the following is a specification.

Our invention relates to kilns for drying malt, grain, or other material by means of air heated by passage over a large heating-surface. The kiln is so arranged that the products of combustion from the furnace for heating the air are prevented from coming in direct contact with the material to be dried, but are made to pass through numerous flues, so as to give up the greater part of their heat to the air before escaping to the chimney.

In the accompanying drawings, Figure 1 is a longitudinal section, and Fig. 2 a transverse section, of a kiln constructed according to our invention. Figs. 3, 4, and 5 are sectional plans on the lines X X, Y Y, and Z Z, respectively.

At the bottom of the kiln is placed the furnace A, the products of combustion from which pass along longitudinal flues B to the said corners of the lower space, where they enter the short upright flues B′, to which the radial flues C connect, and thence they are conducted by four radial flues, C, which are inclined upward and connected to a central smoke-flue, D. From this flue they are conducted by radial flues E, inclined upward to chimneys F, which are led through the ventilating-cowls M. The furnace A and the longitudinal flues B are roofed by double plates G, having between them an air-space. The air for drying the material passes through this air-space between the plates, becoming more and more heated till it reaches a central opening, H, in the upper plate, whence it ascends an air-shaft, K. Around the shaft K are compartments, which may be employed for storing the material that has been dried or is to be dried. Above the air-shaft K are baffle-plates N, which deflect the heated air and distribute it uniformly under the kiln-floor L, which is perforated in the usual manner. The air, after passing through the material laid on the perforated floor L, drying it, escapes through the ventilating-cowls M. Air is supplied to the kiln by air-passages leading under the ash-pit and hot plate G, so that it is partially heated before entering the space between the hot plates.

The temperature of the air may be controlled by dampers suitably arranged in the flues.

Having thus described the nature of our invention and the best means we know for carrying the same into practical effect, we claim—

1. The combination of a furnace and a series of longitudinal flues, B, the upright flues B′, rising from the end flues, the central flue. D, the radial flues C, connecting said central flue and flues B′, the chimneys F, and radial flues E, connecting them with said central flue, substantially as described.

2. The furnace A and flues B, having a roofing composed of double plates G, to form an air-space between them, the upper plate having a central opening, H, formed therein, in combination with an air-shaft, K, formed above said central opening, and baffle-plates N above said shaft, substantially as described.

3. The furnace A, and longitudinal flues B, having a roofing composed of double plates C, to form an air-space between them, the upper one of said plates having a central opening, H, formed therein, the air-shaft K above said opening, the perforated floor L, and baffle-plates N above said shaft and below said floor, in combination with the flue D within said shaft, the chimneys F, the radial flues E, connecting flue D with said chimneys, the radial flues connecting the same flue with the end flues, B, and a ventilating-cowl, M, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 16th day of April, A. D. 1884.

ALFD. SAVILL TOMKINS.
F. M. COURAGE.
FRANK. A. CRACKNALL.

Witnesses:
WILLIAM CRIGHTON,
JNO. P. M. MILLARD.