

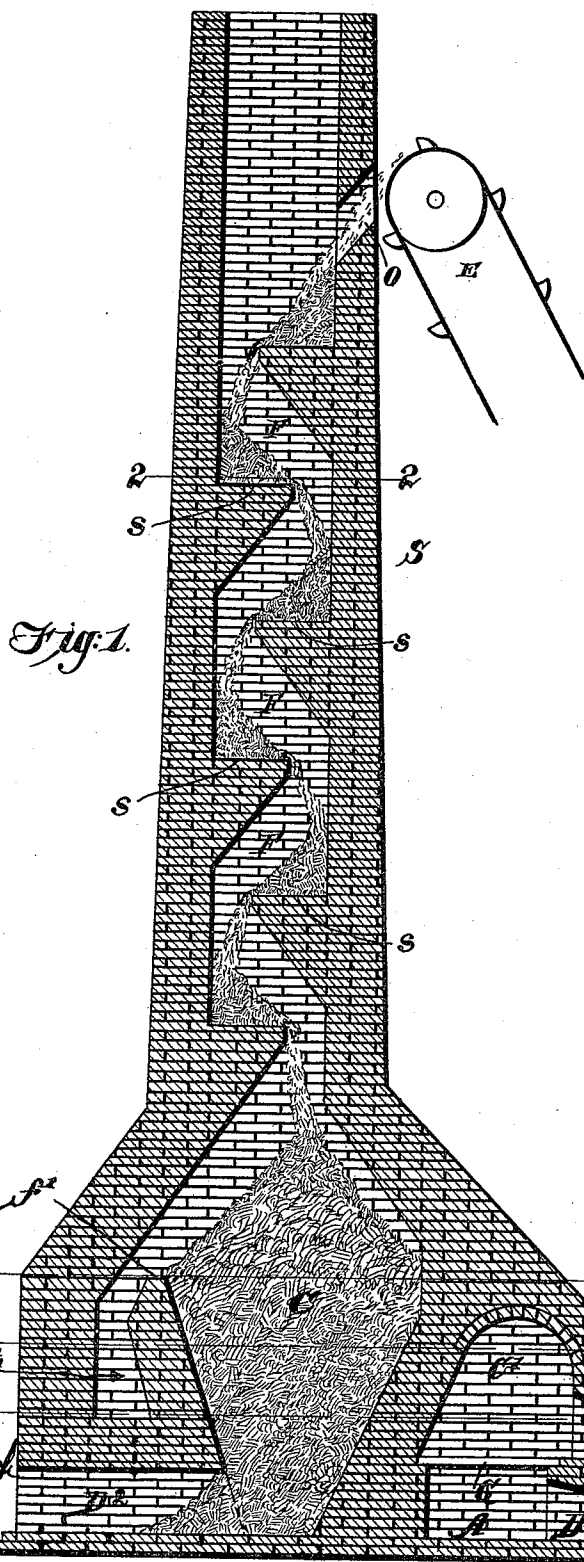
(No Model.)

3 Sheets—Sheet 1.

J. W. WILMOTT.
DRIER.

No. 464,784.

Patented Dec. 8, 1891.



Witnesses:
H. S. Dieterich
P. W. Sommers

Inventor:
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(No Model.)

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Fig. 2.

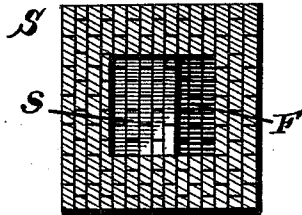
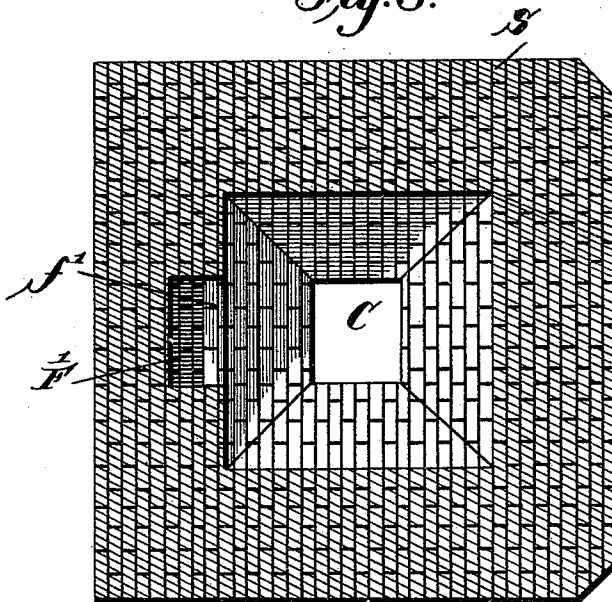


Fig. 3.



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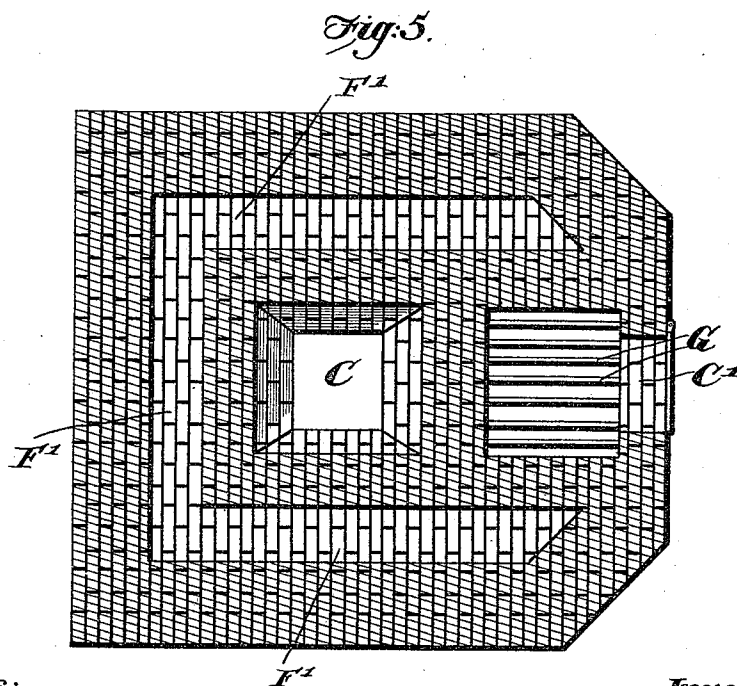
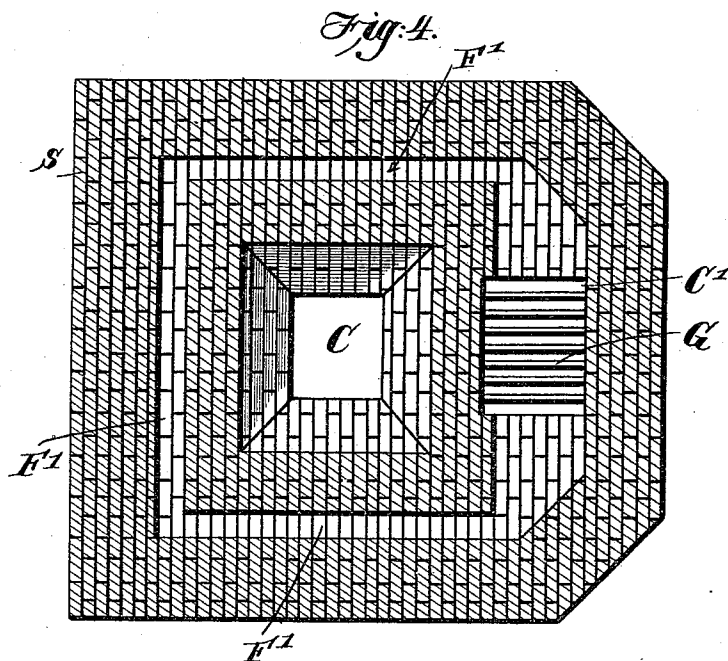
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3 Sheets—Sheet 3.

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DRIER.

No. 464,784.

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UNITED STATES PATENT OFFICE.

JAMES W. WILMOTT, OF FORT MEADE, FLORIDA.

DRIER.

SPECIFICATION forming part of Letters Patent No. 464,784, dated December 8, 1891.

Application filed June 15, 1891. Serial No. 396,321. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. WILMOTT, a citizen of the United States, and a resident of Fort Meade, in the county of Polk and State of Florida, have invented certain new and useful Improvements in Driers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The invention relates to driers, and more especially to that class of driers in which the moisture is evaporated from the material while the latter is in motion.

The invention has for its object to so construct the drier as that all or substantially all of the heat is utilized, and so that excessive or undue wear of the drier is prevented.

To these ends the invention consists in structural features, as will now be fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved drier; and Figs. 2, 3, 4, and 5 are sections taken, respectively, on lines 2 2, 3 3, 4 4, and 5 5 of Fig. 1.

Similar symbols indicate like parts wherever such may occur in the above-described figures of drawings.

My improved drier consists of a stack S, that has inwardly-projecting shelves s, or ledges on its opposite sides, said shelves alternating with one another so as to form within the stack a zigzag flue F. As shown, the shelves or ledges s have their upper faces at right angles to the stack for the purpose of allowing the material to be dried to accumulate thereon until a sufficient quantity of such material has lodged upon the shelves to form an inclined plane for the material fed to the stack. In practice these shelves are so arranged as to project alternately from opposite sides beyond the axis of the stack, as shown, so as to cause the material to flow alternately from one to the other side of the stack.

Above the upper shelf or ledge s the stack is provided with a feed-opening O, through which the material to be dried is fed to the

stack in any convenient manner, preferably by mechanical means—as, for instance, a bucket-elevator E, of which we have shown a part. At the base of the stack is formed an axial chamber C, that has the form of a truncated double cone in section, its discharge, which leads into a suitable lateral discharge-duct D², being contracted to facilitate the accumulation of material in said chamber, which is also made to taper upwardly to the stack. Around three sides of the chamber C is formed a flue F', that leads to the furnace or fire chamber C', of which G is the grate, A the ash-pit, D the furnace-door, and D' the ash-pit door, which, is as usual, provided with draft-dampers. As shown in Fig. 3, the draft-flue F' communicates with the stack through flue-opening f', so that the walls of the chamber C become well heated.

The material to be dried is fed through feed-opening O and falls onto the upper shelf s, where it accumulates until it forms an inclined plane or chute, causing the material as it is introduced into the stack to flow or fall onto the shelf next below and on the opposite side of the stack, and so on to the lower shelf of the series. The material as it moves through the zigzag passage in a direction opposite to that of the heat and products of combustion is constantly subjected to this heat—in fact, to a gradually-increasing temperature as said material approaches the chamber C. In this chamber the material is also allowed to accumulate, and is there subjected to the heat radiated by the walls of the furnace and those of the encompassing draft-flue F', as will be readily understood, the material being removed as it is dried through the discharge-duct D.

The drier is more especially designed for drying what is known as "pebble phosphate," and if the shelves s were constructed with inclined deflecting-faces they would very speedily wear away by attrition, which would necessitate frequent and expensive repairs, which is avoided by constructing the upper or receiving faces of the shelves at right angles to the axis of the stack and utilizing the phosphate itself as a deflecting-facing for said shelves.

In a drier constructed as described it may well be said that all of the heat is utilized, so that the operation of drying is conducted with

a minimum quantity of fuel. Actual practice has demonstrated that three hundred tons of pebble-phosphate rock can be dried about every ten hours at an expenditure of comparatively little fuel as compared with the driers heretofore used.

I am aware that it is not new to construct driers or ore-roasters with a zigzag passage formed by inclined deflecting shelves or projections, and that it is not new to cause the material to flow through such a passage in a direction opposite to that of the products of combustion, and I do not desire to claim these features, broadly; but

What I do claim, and desire to secure by Letters Patent, is—

A drier comprising a stack having a zigzag flue formed by shelves projecting alternately from opposite sides to or beyond the axis of the stack, said shelves having their upper faces at right angles to said axis, a furnace or fire-place at the base of the stack, and a feed-aperture above the upper one of the series of shelves, for the purpose set forth.

JAMES W. WILMOTT.

Witnesses:

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