

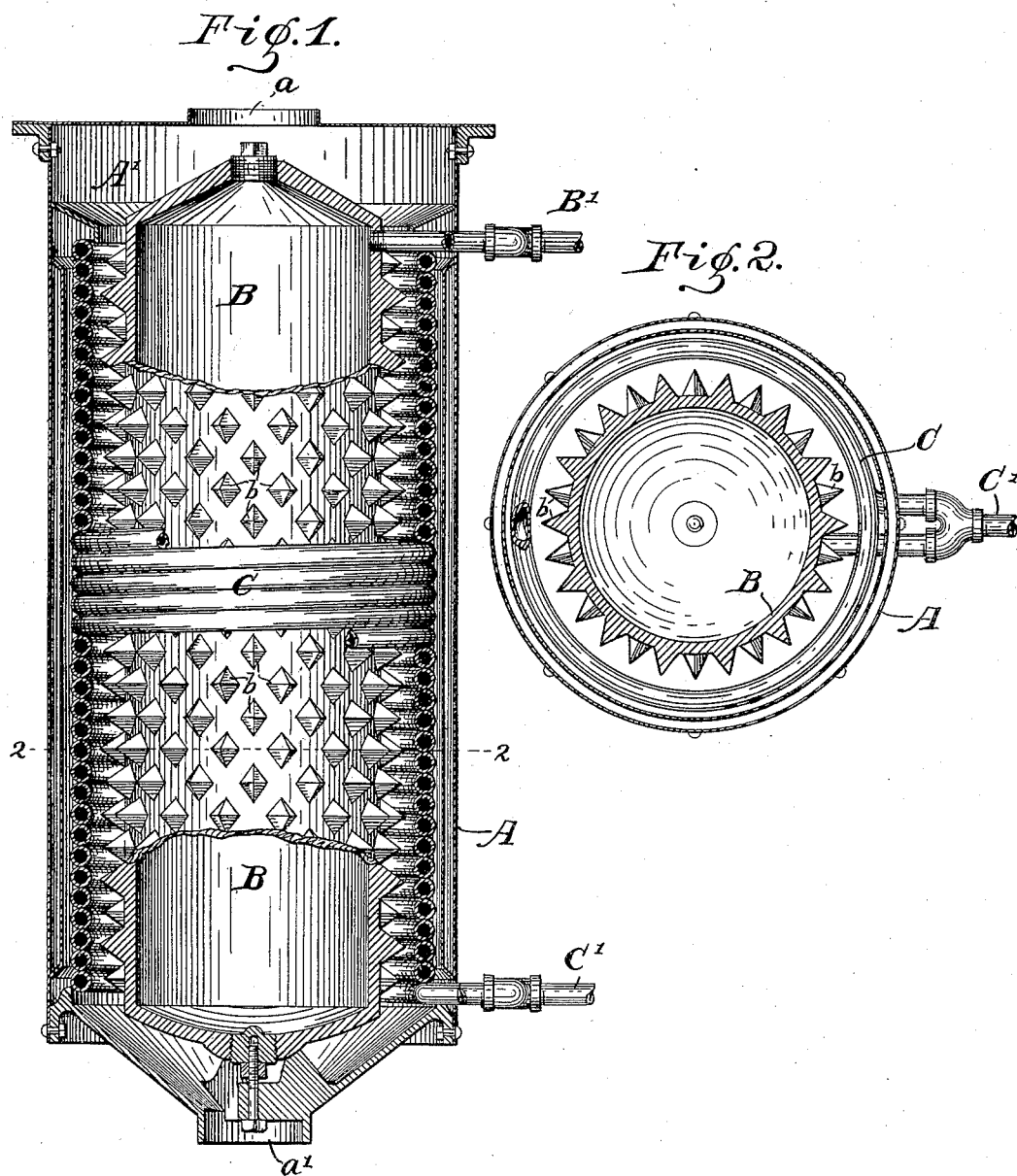
(No Model.)

J. WARRINGTON.

GRAIN HEATER.

No. 383,027.

Patented May 15, 1888.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JESSE WARRINGTON, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE  
NORDYKE & MARMON COMPANY, OF SAME PLACE.

## GRAIN-HEATER.

SPECIFICATION forming part of Letters Patent No. 383,027, dated May 15, 1888.

Application filed May 31, 1887. Serial No. 239,759. (No model.)

*To all whom it may concern:*

Be it known that I, JESSE WARRINGTON, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Grain-Heaters, of which the following is a specification.

My said invention relates to that class of devices by which grain (most commonly wheat) may be heated and dried before grinding; and it consists, essentially, in the combination of an inside cylinder having projections upon its outer surface, a steam-pipe surrounding said inner cylinder in the form of a tight coil, and an appropriate inclosing-jacket.

It further consists in certain details of construction, all as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a vertical sectional view of my improved heater, the outer portion or jacket being shown in central section, the coil of pipes being also shown in central section, except at the middle portion, and the ends of the inside cylinder or drum being shown in central section, the remainder being shown in elevation; and Fig. 2 is a horizontal sectional view looking downwardly from the dotted line 2 2 in Fig. 1.

In said drawings, the portions marked A represent the outer casing of the heater, B the inner cylinder, and C the coil of pipe which surrounds said inner cylinder between it and the outer casing. The construction of these several parts will be clearly understood from an inspection of the drawings.

The casing is preferably double for the greater portion of its length, as shown, so that a dead-air space may be formed for the well-known purpose of such spaces.

The inner cylinder, B, has upon its outer surface a series of preferably diamond-shaped projections, *b*, arranged, preferably, in diagonal rows, so that the grain in passing down between them will be thereby caused to follow an irregular course, and thus be thoroughly mixed and turned, so as to be all exposed to the action of the heat during its passage. The interior of this cylinder communicates with

the steam-pipes, and said cylinder is thus heated from the inside.

The pipe C is a close coil extending from the top to the bottom of the cylinder B, or nearly so, and thus forms the outer wall, against which the grain comes in its passage through the heater. A hopper, A', at the upper end of the heater, inside the casing A, guides the grain between said pipe-coil and the inside cylinder, as will be readily understood.

The operation is as follows: The grain is conducted into the heater through the opening *a* in its upper end, and is guided by the hopper A' to within the pipe-coil C against the cylinder B. It then passes down between said pipe-coil and said cylinder, and, as before stated, by reason of the formation is given an irregular course and thoroughly mixed and turned and all parts exposed to the action of the heat. It is discharged at the bottom through the opening *a'*. The steam enters through the pipe B', which is divided into two branches just before it enters the heater, and one branch of which enters the cylinder, while the other is the commencement of the coil C. A similar arrangement at the lower end permits the steam, after having performed its office, to be discharged from both the cylinder and the coil through the pipe C'.

I am aware that grain-heaters have been made with an internal cylinder provided with circumferential ribs; but I do not consider the same as anticipating my invention, as herein shown and claimed.

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

1. In a grain-heater, the combination, with its other parts, of an internal cylinder provided with the pointed external projections, *b*.

2. In a grain-heater, the combination, with its other parts, of an internal cylinder provided with diamond-shaped projections which extend out nearly to the surrounding portion of the structure.

3. In a grain-heater, the combination, with its other parts, of an internal cylinder which is provided with projections arranged in diagonal rows, whereby the grain is given an irregular course through the heater.

4. The combination of the outer casing, A,  
inner cylinder, B, provided with the projec-  
tions *b*, arranged in diagonal rows, the sur-  
rounding pipe-coil C, and the hopper A', all  
5 arranged and operating substantially as set  
forth.

In witness whereof I have hereunto set my

hand and seal, at Indianapolis, Indiana, this  
25th day of May, A. D. 1887.

JESSE WARRINGTON. [L. S.]

In presence of—

C. BRADFORD,

CHARLES L. THURBER.