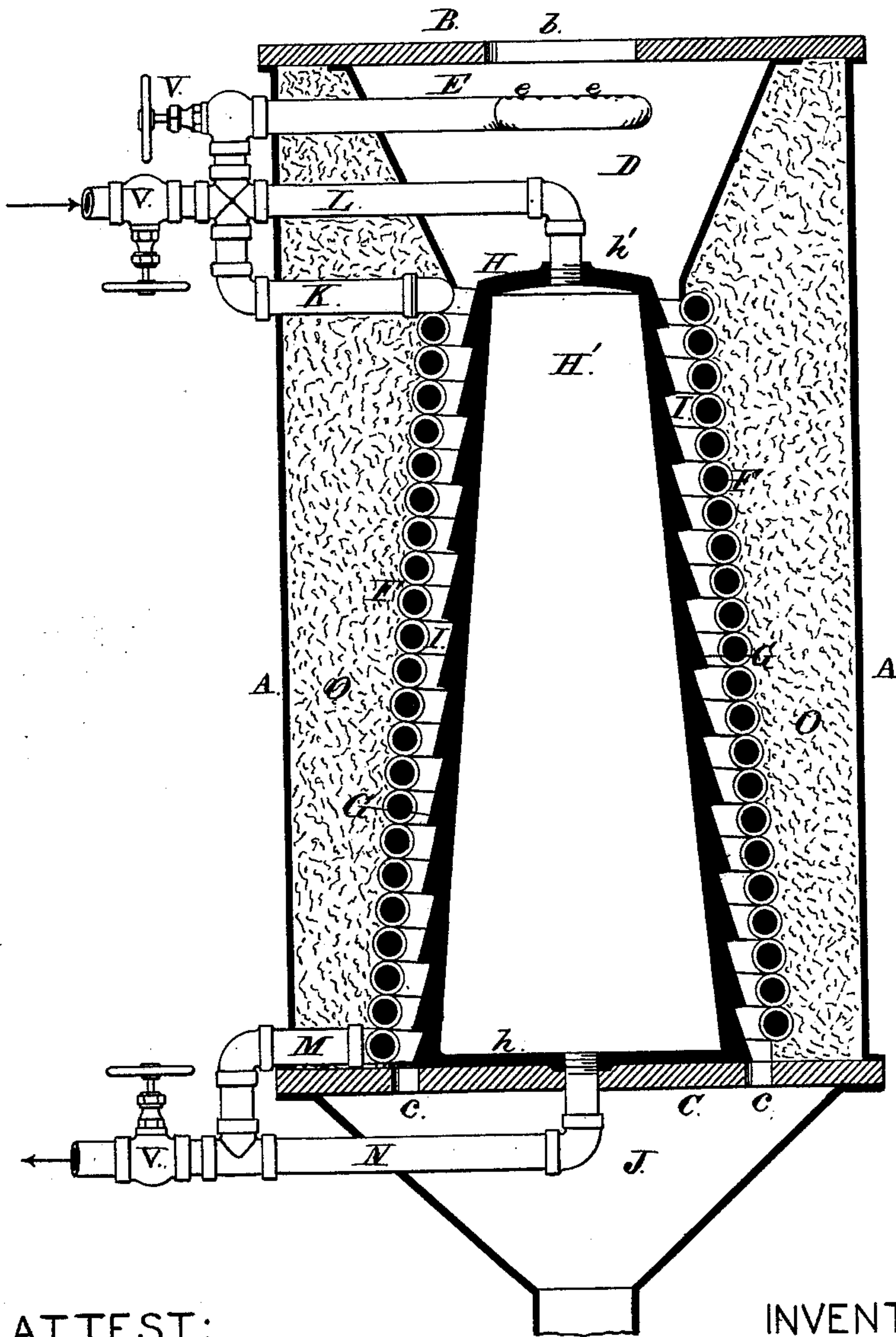


J. E. WELCH.
Wheat-Heater.

No. 218,352.

Patented Aug. 5, 1879.



ATTEST:

Geo. H. Knight
Walter Allen

INVENTOR:

James E. Welch
By Knight Bros.
Atty's

UNITED STATES PATENT OFFICE.

JAMES E. WELCH, OF WHITE HALL, ILLINOIS, ASSIGNOR OF ONE-HALF HIS
RIGHT TO ALBERT B. BOWMAN, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN WHEAT-HEATERS.

Specification forming part of Letters Patent No. **218,352**, dated August 5, 1879; application filed
April 10, 1879.

To all whom it may concern:

Be it known that I, JAMES E. WELCH, of White Hall, in the county of Greene and State of Illinois, have invented a certain new and useful Improvement in Wheat-Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

This is an improvement in that class of machines which are used to heat the wheat prior to grinding.

My improvement consists in the described combination of parts, consisting of an inner steam-chamber of a frusto-conical shape, and whose surface is formed into downward-projecting steps or circumferential ridges, to stir the grain in its descent; a close steam-coil a little distance outside the cone and concentric therewith, leaving an annular chamber for the descent of the grain between them; a cylindrical jacket or case at a distance outside the coil, leaving an annular chamber to contain non-conducting packing; hoppers at top and bottom for the grain, and passages from the hoppers to the heating-chamber, and a hollow bottom plate having vent-openings therein, to equalize the flow of grain through the heating-chamber.

The drawing is an axial section of the machine.

The sides of the outer case are shown at A. B is the top, and C the bottom, of the case proper. The top has a central orifice, *b*, for the entrance of the grain into the hopper D. Within the hopper D may be a steam-jet pipe, E, whose office it is to dampen and heat the grain as it enters by the discharge of steam from the jet-holes *e*.

The steam-jet pipe is supplied with a suitable valve or cock, V, to regulate the amount of steam, or to shut it off.

F is a steam-coil, decreasing in diameter upward, and standing on the bottom plate, C. Extending from the top of the coil to the top B is the hopper D, which the grain first enters.

Within the coil F, and concentric with it, is a frusto-conical hollow chamber, H, larger in diameter at the base *h*, which rests upon the bottom plate, C.

The relative diameter of the top *h'* of the chamber and the lower end of the hopper D is such that an annular passage is left between them, through which the grain passes from the hopper into the heating-chamber I, between the cone H and coil F.

The outer face of the cone is formed into downwardly-projecting circumferential ribs or ridges G, to cause the agitation and mixing of the grain in its descent through the heating-chamber.

c c are openings through the bottom plate, C, for the passage of the grain from chamber I to the hopper J beneath.

K L are steam-pipes communicating with the steam-coil F and the steam-chamber H' of the cone, and M N are drain-pipes, to allow the escape of condensed water from the coil and cone, respectively. The pipes have suitable valves V.

The space *o*, between the coil and the outer case, has non-conducting packing O, of asbestos or other material, to prevent the escape of heat.

The hopper J may discharge directly into the hopper of the millstones.

The vent from the heating-chamber I is made through a number of small openings, *c*, to equalize the flow from all parts of the chamber I, each of the holes *c* allowing the passage of an equal quantity of grain, and insuring the movement of the grain through the chamber I at equal speed in all parts of the chamber.

I am aware that grain-driers have been constructed to admit of the grain passing down between the outside of a steam-chamber and the inside face of an inclosing-cylinder. I am aware that the faces of such steam-chambers have been made of angular or sloping form, and also that they have been corrugated, and also formed out of coiled pipe surrounded by another coil of pipe, so as to form a grain-passage between; and I am also aware that some have had angularly-shaped wings formed on or in the exterior face of such steam-cylinders. I am also aware that drying-kilns have been constructed with double walls having a lining of earth between. Such constructions, therefore, I do not claim; but

What I claim as my invention is—

1. The combination, in a grain-heater, of the hollow steam-cone H H', having downwardly-projecting circumferential ribs G, conical surrounding steam-coil F, with heating-chamber I, and plate C, having openings c, substantially as and for the purpose set forth.
2. The combination of the conical steam-coil F and steam-cone H, the latter having its outer side formed into downwardly-projecting circumferential ribs G, as and for the purpose set forth.
3. The combination, with the steam-cone H, having downwardly-projecting circumferential ribs G, and the conical steam-coil F, of the non-conducting jacket A O, substantially as set forth.

JAMES E. WELCH.

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.