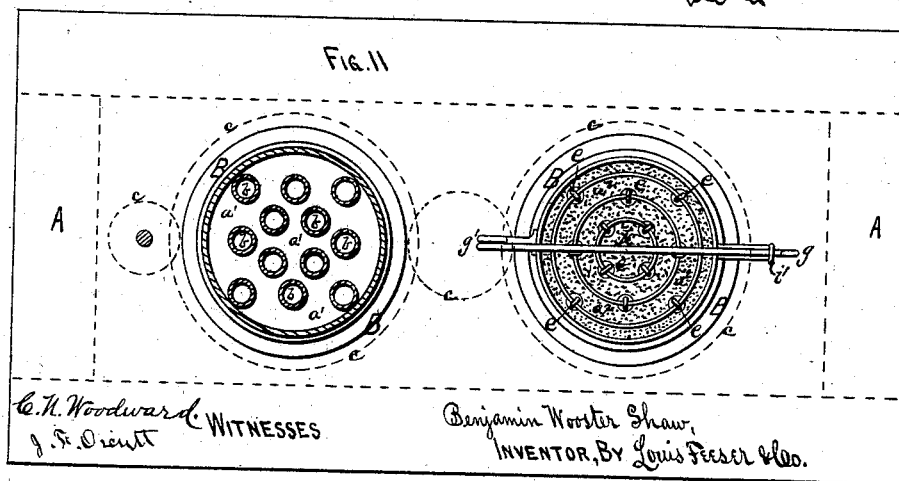
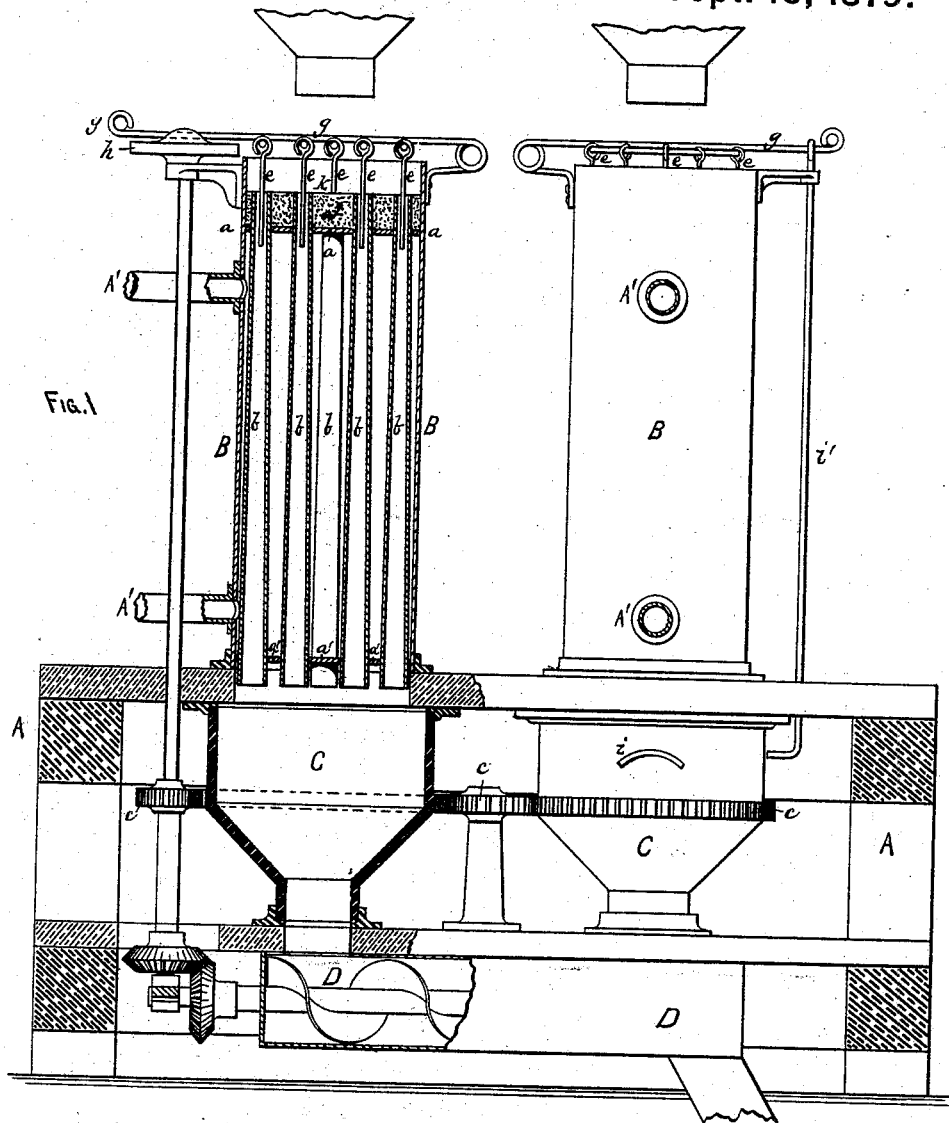


B. W. SHAW.
Wheat-Heater.

No. 219,599.

Patented Sept. 16, 1879.



UNITED STATES PATENT OFFICE.

BENJAMIN W. SHAW, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN WHEAT-HEATERS.

Specification forming part of Letters Patent No. **219,599**, dated September 16, 1879; application filed March 20, 1879.

To all whom it may concern:

Be it known that I, BENJAMIN WOOSTER SHAW, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Wheat-Heaters, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of two of my heaters arranged side by side, one in section and the other in exterior elevation. Fig. 2 is a semi-sectional plan view.

This invention relates to machines for heating wheat, &c., just previous to grinding.

The invention consists in arranging a series of hanging wires above the upper ends of the grain-tubes, so that the lower ends of said wires shall hang within the tubes and be adapted to vibrate therein to prevent clogging of the grain, as will be hereinafter set forth.

The invention further consists in securing the upper ends of the grain-tubes within a diaphragm, so that the said tubes shall project above the same, and filling said space between the diaphragm and upper ends of the tubes with a suitable non-conductor, substantially as and for the purpose presently explained.

The invention further consists in so arranging the tubes within the cylinder and diaphragms that the central portion of the upper diaphragm and its non-conducting coating shall be solid to receive the grain as it is fed to the cylinder, and to distribute it evenly and radially to the series of surrounding tubes, substantially as will be hereinafter set forth.

A is a frame-work, upon which is mounted a number of cylinders, B, into which steam is admitted by pipes A', and a^1 are two heads, between which tubes b run. These tubes are made smaller at the top than at the bottom, and end above a hopper, C, so arranged as to be revolved by gearing c , or any other suitable means. Beneath the hoppers C a screw-conveyer, D, will be run to convey the grain away from the machine. The upper plate, a , will be set some distance below the top of the cylinder and a short distance below the tops of the tubes b , so that when the space around the tubes and above the head a is filled in with

plaster-of-paris, wood, felt, or any other non-conducting material, a^2 , a shallow chamber will be left for the grain when it is first run in. By this means the grain, lying for some time in the chamber before it can run through the tubes, will not be injured by the heat.

e are a number of small wires, which project down a short distance into each tube, and are made to rise and fall by being connected to a lever, g , which is actuated by a cam-wheel, h , or by a cam, i , upon the revolving hopper C, acting upon a rod, j . These wires e by their motion agitate the grain in the tubes and prevent its becoming clogged.

The tubes b will be so arranged that a space, k , will be left in the center in which no tubes occur. This is to cause the grain, which will be spouted into the reservoir in the center, to spread out over the entire surface of the head a , and thus run at a uniform speed through all the tubes.

The operation is as follows: The grain, being spouted upon the center blank space, k , upon the non-conducting head a^2 , spreads out over the entire surface and runs down through the tubes. When it strikes the heated air and tubes the moisture within the "berries" is drawn to the surface, and will swell them and cause them to become moist. If the tubes were straight this swelling and moisture would soon clog them; but by enlarging them toward the bottom space is provided for the swelling, and thus an even flow of the grain is insured. The heat will be so gaged as to act upon the grain with just sufficient power to draw the moisture from the interior of the grain out into the bran, and there leave it. In some cases the grain will not flow perfectly free at the tops of the tubes; hence the necessity for the agitating-wires e , which serve to keep it in motion. After leaving the tubes the grain falls into the hopper C, which, by its revolving, insures not only the even and continuous flow of the wheat, but acts as a mixer to thoroughly intermingle the grain, so that should some of the tubes be heated to a higher degree than others the grain will be so perfectly mixed that the temperature will be equalized.

The screw-conveyer D also acts as a mixer,

so that should the grain from one cylinder be heated to a higher degree than the other it will be equalized by passing through the conveyer.

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

1. In combination with the tubes *b*, a series of wires, *e*, adapted to be moved within said tubes by a lifting-lever, for the purpose of agitating and facilitating the feed of the grain, substantially as hereinbefore set forth.

2. In combination with the cylinder B, tubes *b*, and diaphragm *a*, arranged as described,

the non-conducting filling to prevent overheating of the grain, substantially as hereinbefore set forth.

3. In combination with the tubes *b* of the cylinder B, the imperforate central space to receive the grain and insure its equal lateral distribution, as hereinbefore set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BENJAMIN WOOSTER SHAW.

Witnesses:

T. M. FOLLANSBEE,

C. N. WOODWARD.