

(No Model.)

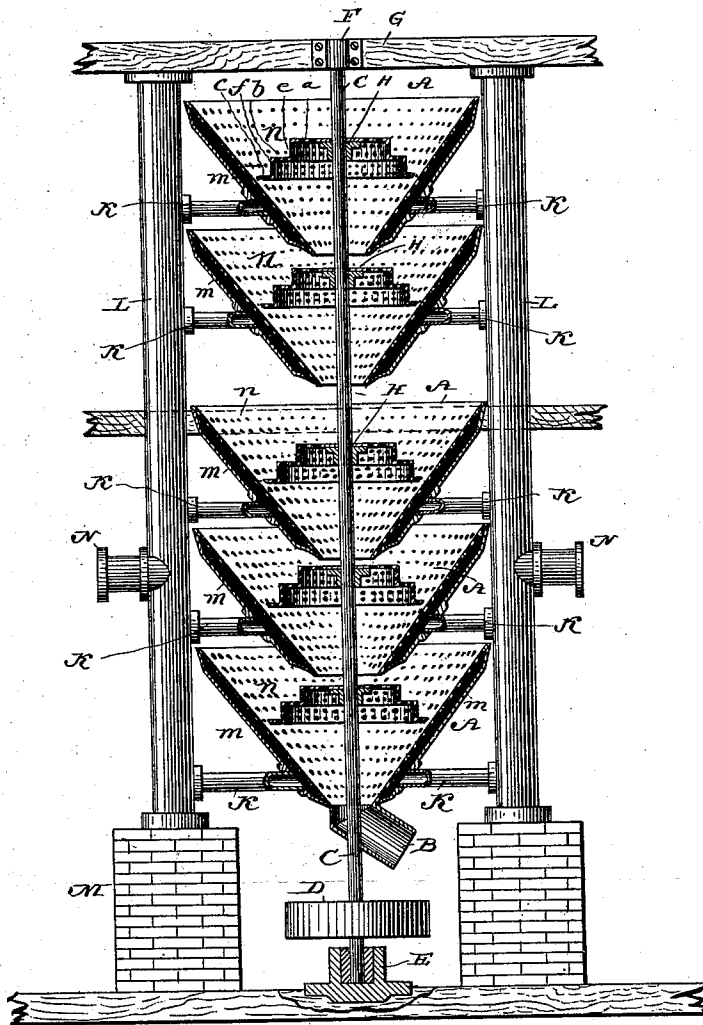
2 Sheets—Sheet 1.

P. JEPSON.  
GRAIN DRYING APPARATUS.

No. 373,140.

Patented Nov. 15, 1887.

Fig. 1.



Witnesses.

*H. W. Cluett*  
*Henry N. Smith*

Inventor.

*Peter Jepson*  
By his Attorney,  
*John C. Lennie*

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

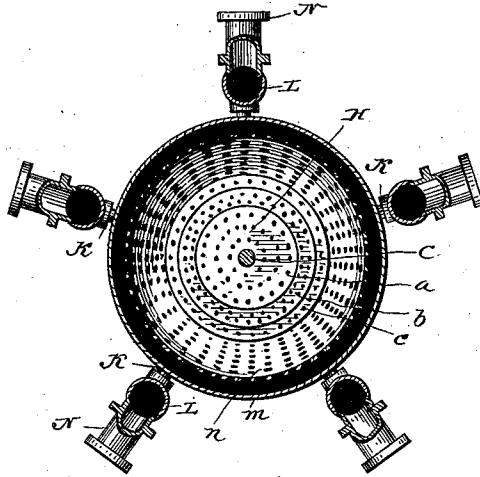
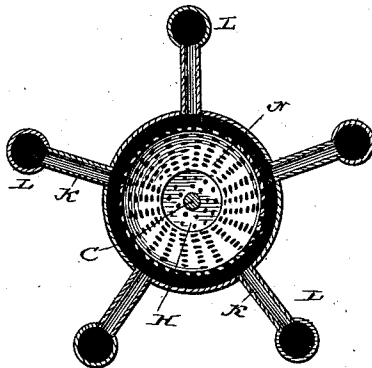


Fig. 3



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# UNITED STATES PATENT OFFICE.

PETER JEPSON, OF PORT CHESTER, NEW YORK.

## GRAIN-DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 373,140, dated November 15, 1887.

Application filed November 6, 1886. Serial No. 218,219. (No model.)

*To all whom it may concern:*

Be it known that I, PETER JEPSON, a citizen of the United States, residing at Port Chester, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Grain-Drying Apparatus; 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.

My invention relates to certain new and useful improvements in apparatus for drying grain after it has been subjected to the mashing operation in brewing, distilling, and the like.

The object of my invention is to produce an apparatus which, while thoroughly effective in its operation, shall accomplish its work in a comparatively short period of time, and which shall be simple in construction, durable, and capable of being erected at a comparatively small expense. For the accomplishment of these ends I have devised the construction illustrated in the accompanying drawings, wherein—

Figure 1 represents a front elevation of my improved apparatus, a portion thereof being shown in section. Fig. 2 represents a cross-section upon the line 2 2 of Fig. 1, and Fig. 3 represents a cross-section upon the line 3 3 of Fig. 1.

Similar letters of reference indicate similar parts throughout the several views.

The apparatus consists, primarily, of a number of stationary funnel-shaped hoppers, A, arranged in vertical series, the exit-openings of the upper ones being located centrally above the mouths of those below, so as to deliver the grain during the drying operation from one to the other with uniformity in regular progression down to the lowermost hopper of the series, which is provided with a discharge-chute, B.

A shaft, C, provided with a band-wheel, D, or the like, for effecting its revolution from any suitable source of power, extends vertically through the series of hoppers and rests in the journal-box step E. At its upper end it is journaled at F in the cross-piece G, form-

ing a portion of the frame-work of the apparatus.

Upon the shaft C are keyed or otherwise secured the series of disks H, of perforated metal or its equivalent, said disks being arranged, respectively, beneath the exit-openings of the upper hoppers and within the mouths of the lower hoppers. The disks are formed of annular portions *a b c*, arranged in step form one above the other, as shown, a sufficient space being left between the portion *c* and the inner wall of the hopper to permit in each case the passage of the grain to the disk and hopper below. The annular portions *a b c* are connected by the portions *e f*, which are also perforated.

The hoppers A consist of an interior perforated body, *n*, and an outer imperforate casing, *m*, surrounding the same, leaving an intermediate annular space. These spaces are connected by means of branch pipes K with the hollow columns L. The columns L are mounted upon suitable basal supports M and connect by means of branches, as N, with conduits conveying highly-heated air from an air-heating furnace.

In the apparatus illustrated in the drawings I have shown but two of these hot-air columns; but whatever the number employed care should be taken to locate the branch pipes K at equal distances from each other, so that the air-currents upon entering the hopper-casing may meet and issue through the perforated hopper at a substantially uniform pressure throughout its entire surface.

The operation of my invention is as follows: The wet or moist grain to be dried is conveyed by any suitable elevating device and discharged into the mouth of the uppermost hopper, falling upon the uppermost disk. The heated air, issuing under pressure from the hot-air columns, enters the hopper-casings, and being equalized in pressure therein passes through the perforations of the hopper-lining and into the interior of the hopper. A portion of the air rises through the perforations in the disks, meeting the grain on its under side, and another portion strikes it upon its upper side above the disks. A rotating motion being imparted to the shaft and its disks,

the grain as it becomes partially dried is thrown off by centrifugal force from the top portion, *a*, of the upper disk to the lower portions, *b c*, thereof. In passing from one of these steps to the other heated air issuing from *e f* strikes it and assists in drying it. It is finally thrown off against the perforated sides of the hopper, and descends along the same, passing out at the exit-opening upon the disk below, and being subjected to the air-jets from perforations on its downward passage. In like manner it passes from one disk and hopper to the next below in succession until it reaches and passes out at the discharge-chute B. It may thereafter, if desired, be passed through a second similar apparatus, if the necessary degree of dryness has not been secured.

I am aware that it has been heretofore proposed to dry wet grain and the like by subjecting the same to the action of heated air, passing upwardly in a tower through which the grain descends, said tower being provided with funnel-shaped chutes and disks arranged above and between said chutes, and rotating rakes traveling upon said disks. I am also aware that for cooling purposes a construction of tower has been proposed wherein the grain is admitted at the upper portion thereof upon a perforated disk mounted upon a revolving shaft, said shaft having similar disks arranged in series below it, with intermediate perforated funnels, and the cooling air being admitted below these funnels. I desire to be understood as claiming neither of these constructions. My device possesses the advantage over them of obtaining an equalized

pressure between the casing of the funnels and the perforated interior, so that the heated air will issue with substantial uniformity through all of the said perforations, thereby securing equal distribution of the heating effects. The peculiar construction of centrifugal disk adopted by me while permitting the grain to be disturbed in falling from one section to the other, thus exposing new surfaces of the grain to the action of the air-currents, at the same time delays its passage to the bottom of the tower, thereby permitting the heated air to act upon it for a longer period.

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

1. A grain-drier consisting of a number of funnel-shaped hoppers arranged in series one above the other, said hoppers having perforated linings and imperforate casings surrounding said linings, hollow hot-air columns communicating with the casings by branch pipes, and a rotatable shaft having a series of perforated disks, substantially as shown and described.

2. In a grain-drier, the distributing and drying disks consisting of the annular portions *a*, *b*, and *c* and connecting portions *e* and *f*, all of which are perforated, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

PETER JEPSON.

Witnesses:

JOHN C. PENNIE,  
M. A. BALLINGER.