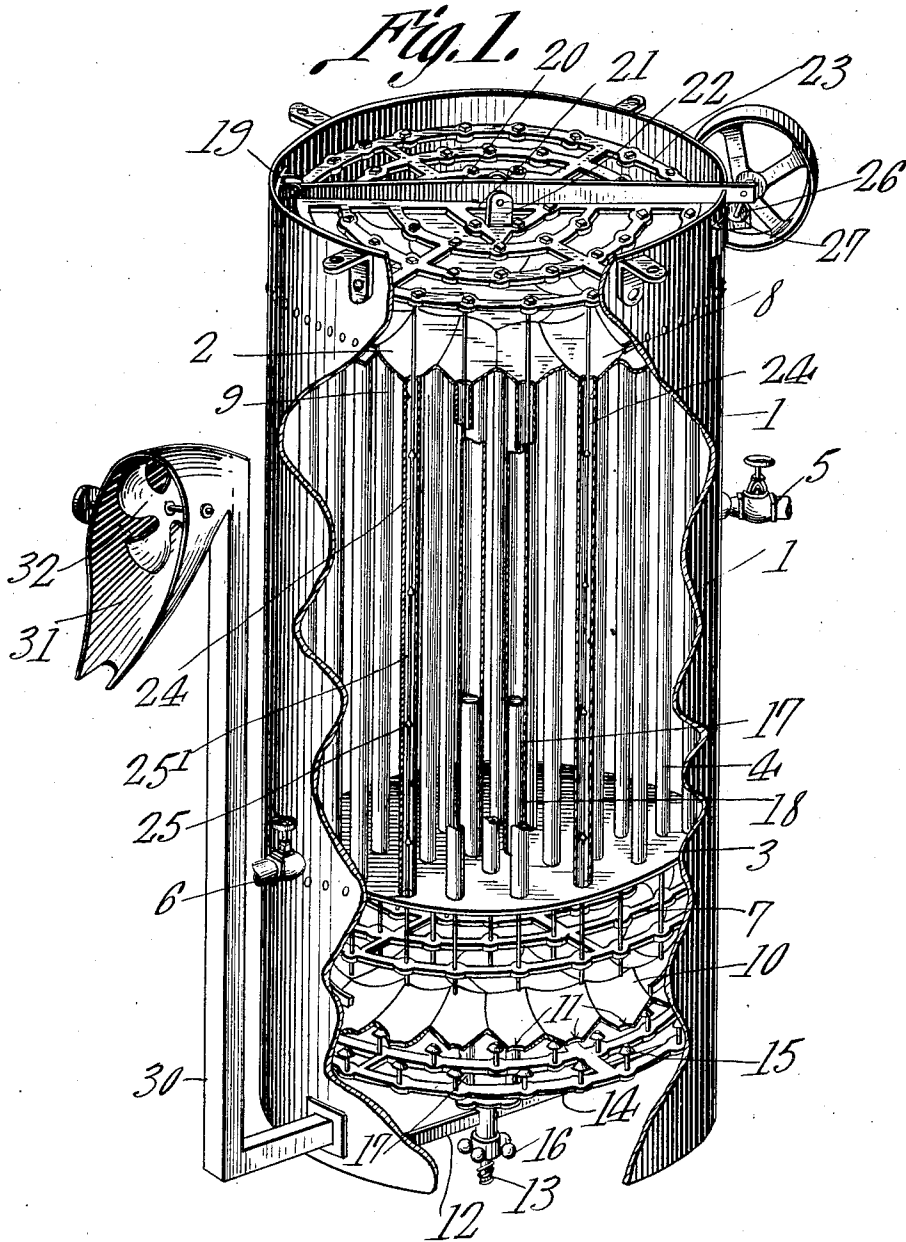


P. PROVOST.  
GRAIN DRIER AND SCOURER.  
APPLICATION FILED JAN. 25, 1911.

1,000,120.

Patented Aug. 8, 1911.

2 SHEETS—SHEET 1.



Witnesses

*J. P. ...*  
L. H. Wilson.

*Peter Provost,* Inventor

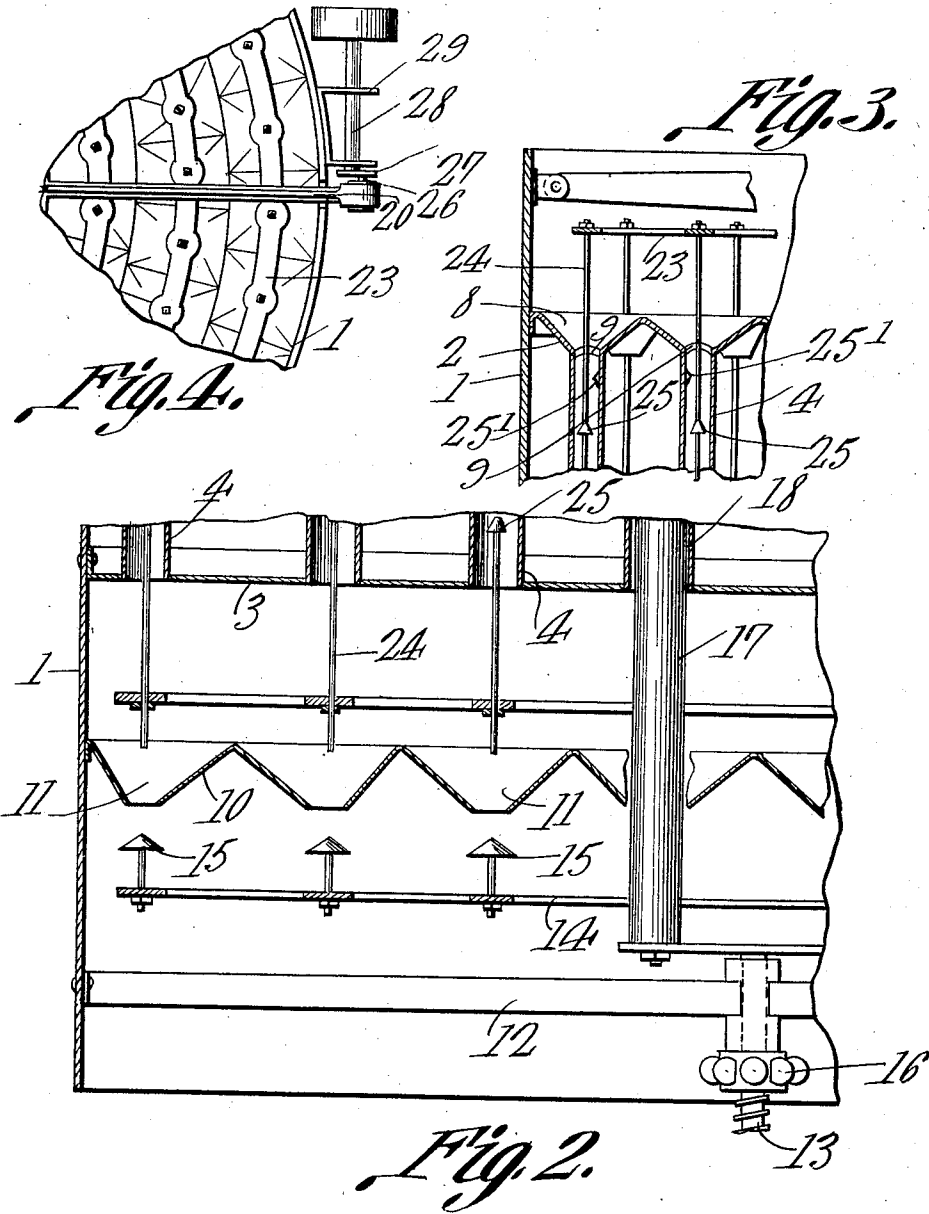
by *C. A. Knowlton,* Attorneys

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*J. P. [Signature]*  
*L. H. Wilson.*

*Peter Provost,*  
 Inventor  
 by *Cash & Co.*  
 Attorneys

# UNITED STATES PATENT OFFICE.

PETER PROVOST, OF MILWAUKEE, WISCONSIN.

GRAIN DRIER AND SCOURER.

1,000,120.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed January 25, 1911. Serial No. 604,693.

To all whom it may concern:

Be it known that I, PETER PROVOST, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Grain Drier and Scourer, of which the following is a specification.

This invention relates to grain driers and scourers of that type disclosed in Patent No. 940,190 issued to me on November 16, 1909, and in Patent 971,559, issued to me on October 4, 1910.

Devices of this character, such as heretofore constructed, have utilized tubular members arranged within a heating drum and through which grain is passed so as to be thoroughly dried, the passage of the grain being retarded by suitable means provided therefor and there being additional means whereby the grain is spread within the tubular members so as to be properly heated.

One of the objects of the present invention is to provide means whereby the grain, in passing through the heater, will be thoroughly agitated and clogging of the tubular conducting members thus prevented.

Another object is to provide means whereby all of the agitating devices may be simultaneously operated.

A further object is to provide a novel arrangement of valves having means whereby they can be simultaneously adjusted to regulate the discharge of grain from the tubular members.

Another object is to provide means for removing all dust, etc., from the grain before it is directed to the grinding rollers.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings, the preferred form of the invention has been shown.

In said drawings:—Figure 1 is a perspective view of the grain scourer and drier, parts being broken away. Fig. 2 is a vertical section through part of the lower portion thereof. Fig. 3 is a similar section, on a reduced scale, through part of the upper

portion of the drier. Fig. 4 is a top plan view of a part of the drier.

Referring to the figures by characters of reference, 1 designates a drum or casing to the upper end of which a feed hopper may be connected. Heads 2 and 3 are secured within the casing at points removed from the ends thereof, the two heads being connected by a series of tubular grain conductors 4. These conductors are preferably parallel and are open at their ends. The space formed around the tubular conductors and within the casing is adapted to be supplied with steam or any other heating medium through a pipe 5, there being an outlet pipe 6 also extending from the casing.

The head 2 is formed with depressions 8 each having an opening 9 in the bottom thereof registering with the upper end of one of the tubular conductors 4. It will be apparent, therefore, that when grain is supplied to head 2 it will shift by gravity into the depressions 8 and then fall into the various tubular conductors 4.

Secured within the lower portion of the casing 1 and directly under the head 3, is a retarding plate 10 shaped with depressions therein directly under the tubular conductors 4, each depression having an outlet opening 11 in the bottom thereof, the diameter of the opening being less than that of the tubular conductor thereabove and said opening being concentric with the axis of the tubular conductor.

A cross bar 12 is secured diametrically within the lower end portion of the casing and has an adjusting screw 13 loosely mounted therein, this screw extending from the middle portion of a skeleton frame 14 carrying valves 15 one of which is located directly below each of the openings 11. A nut 16 engages the screw and is swiveled on the bar 12 and it will be apparent that, by turning the nut the screw and the skeleton frame 14 can be moved toward or away from the retarding plate 10 and the valves 15 can therefore be shifted so as to close the openings 11, or to expose said openings to any desired extent. In order that the skeleton frame and the valves may be properly guided during this movement, guide stems 17 project upwardly from the skeleton frame at diametrically opposed points, each of these stems sliding within an opening in the retarding plate and projecting into a

cylindrical guide casing 18 mounted on the head 3, this casing being steam tight and sufficiently long to permit the necessary movement of the stem therein.

- 5 A bracket 19 is secured within the upper end portion of casing 1 and has a lever fulcrumed at one end thereon, this lever being indicated at 20. An ear 21 extends downwardly from that portion of the lever arranged directly over the center of the head 3 and this ear is pivotally connected to an ear 22 extending upwardly from the center of a skeleton frame 23, which is thus supported above and out of contact with the head
- 10 2. Rods 24 are secured to the skeleton frame and are extended longitudinally within the tubular conveying members 4, the lower ends of the rods being slidable within openings formed in an open frame 7 fixedly
- 15 20 mounted between the head 3 and the plate 10, and said rods being thus held positively at the centers of the tubular conveyers. Each rod has a series of knobs or enlargements 25 thereon and projections 25' are formed in the tubes.

One end of the lever 20 is engaged and actuated by a pitman 26 connected eccentrically to a disk 27. Said disk is arranged on a shaft 28 adapted to be rotated in any manner desired, and which may, if preferred, be journaled in a bracket 29 outstanding from the casing 1. A tube 30 extends upwardly from the bottom portion of casing 1 and opens into an outlet hood 31 having a fan 32 therein and which may be operated in any desired manner.

In using the apparatus, the valves 15 are shifted toward or away from the openings 11 so as to properly control the escape of grain through the openings. Steam is then admitted to the casing 1 so as to thoroughly heat the tubular conveying members 4. Grain is then directed on to the head 3 and is deflected by the head into the several tubular members 4 through which the grain flows downwardly on to the retarding plate 10. Shaft 28 is set in motion and the rotating disk 27 causes the pitman 26 to oscillate the lever 20 and thus impart an up and down movement to the skeleton frame 23 and to the rods 24 and the enlargements 25 thereon. These enlargements cooperate with projections 25' to thoroughly agitate the contents of the tubular members 4 and there is therefore no danger of the grain clogging said members and thus interfering with the proper operation of the apparatus. As the grain leaves the tubular members 4 it drops on to the retarding plate 10 and, as the diameter of each opening 11 is less than that of the discharge end of the tube 4 thereabove, it will be apparent that more or less of the grain will be piled on this retarding plate because the grain cannot escape through the open-

ings as fast as it is supplied thereto. This, however, will not be objectionable, because the agitating devices positively prevent any clogging of the tubular members. The retarding plate is utilized for the purpose of retaining the grain for a sufficiently long period to insure proper drying thereof before it is discharged. Dust and other objectionable substances are sucked from the lower portion of the casing by the fan 32.

What is claimed is:—

1. A heater of the class described including a casing, a retarding plate in the lower end of said casing, and having depressions in the upper face thereof, one depression being located below each tube and each depression having an opening in the bottom thereof, tubular grain conducting members extending from the distributing head and supported above and adapted to discharge into the respective depressions in the retarding plate, valves, and means for simultaneously shifting the valves to open or close the apertures within the retarding plate.
2. A heater of the class described including a casing, tubular grain conducting members extending therethrough, rods extending longitudinally within said conductors, means below the members for guiding the rods, means above the members for simultaneously shifting the rods along parallel lines, and grain engaging devices upon each rod and conducting members.
3. A drier of the class described including a casing for the reception of a heating medium, tubular grain conductors mounted within the casing, a movable skeleton structure supported thereabove and within the casing and in the path of grain discharged into said casing, agitating devices depending from said structure, one of said devices being disposed within each of said conductors, grain engaging devices upon each of said agitating devices, means below the conductors for guiding the agitating devices and means for reciprocating said structure.
4. Apparatus of the class described including a casing for the reception of a heating medium, tubular grain conductors supported within the casing, a retarding plate below and spaced from the conductors and having apertured depressions below the respective conductors, valves for controlling the outlets, a structure mounted for movement above the conductors, devices extending therefrom and into the conductors, a guide for said devices and between the conductors and retarding plate, and grain engaging elements upon each of said devices.
5. Apparatus of the class described including a casing for the reception of a heating medium, grain conducting tubes within the casing, a retarding plate below and

spaced from the conductors and having apertured depressions below the respective conductors, a structure movably mounted above the tubes, valves for controlling the apertures, a guide below the tubes and above the retarding plate, members slidable within the guide and connected to said structure, said members extending longitudinally through the tubes, and agitating devices upon each of said members.

6. Apparatus of the class described including a casing for the reception of a heating medium, grain conducting tubes extending longitudinally therein, a retarding plate below and spaced from the conductors and having apertured depressions below the respective conductors, an adjustably supported frame below the retarding plate, valves carried thereby, means upon said structure and slidable within the casing for guiding the valves to and away from the apertures, a movably supported structure above the tubes, agitating devices extending from said structure and longitudinally through the tubes, and a guide for said devices and above the retarding plate.

7. Apparatus of the class described including a casing for the reception of a heating medium, grain conducting tubes supported within the casing, means within the upper portion of the casing for distributing grain into the various tubes, means supported below the tubes for retarding the movement of the grain within the tubes, co-

operating means within and above the tubes for agitating the contents of the tubes, valves for regulating the passage of the grain through the retarding means, an exhaust tube, and means for setting up a current of air through said tube.

8. A heater of the class described including a casing, grain conducting tubes therein, a retarding plate below and spaced from the tubes and having depressions under the respective tubes, there being an opening in the bottom of each depression, and simultaneously shiftable valves for controlling the passage of grain through said openings.

9. A heater of the class described including a casing, grain conducting tubes therein, a retarding plate below and spaced from the tubes and having depressions therein arranged under the respective tubes, there being an opening in the bottom of each depression, a series of valves for controlling the passage of grain through the openings, means for simultaneously shifting the valves, and cooperating means extending between the tubes for guiding the valves toward and away from the openings.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

PETER PROVOST.

Witnesses:

JOHN C. KLEIST,  
IRMA RUPP.