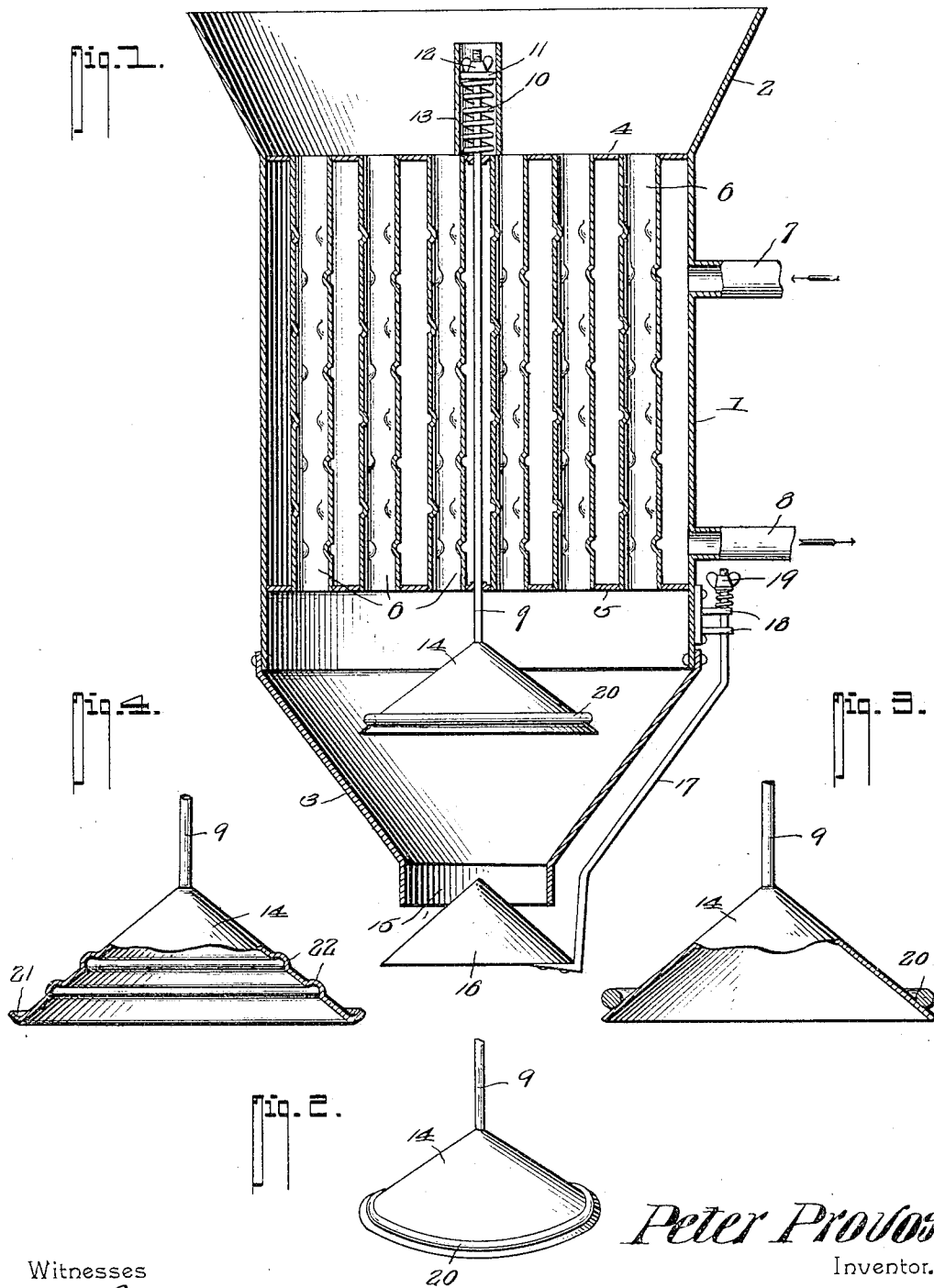


No. 787,396.

PATENTED APR. 18, 1905.

P. PROVOST.
GRAIN HEATER.

APPLICATION FILED NOV. 14, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

PETER PROVOST, OF MENOMINEE, MICHIGAN.

GRAIN-HEATER.

SPECIFICATION forming part of Letters Patent No. 787,396, dated April 18, 1905.

Application filed November 14, 1904. Serial No. 232,754.

To all whom it may concern:

Be it known that I, PETER PROVOST, a citizen of the United States, residing at Menominee, in the county of Menominee and State of Michigan, have invented a new and useful Grain-Heater, of which the following is a specification.

This invention relates to grain-heaters, and particularly to that class of grain-heaters in which the grain is caused to pass through a plurality of tubes extending through a suitable casing, which constitutes a heating-chamber.

Heretofore difficulty has been experienced in causing the grain to pass through the tubes of a heater of this class at an even rate. The passage of grain through tubes disposed directly above or comparatively near the exit would be more rapid than the passage of grain through more remotely-disposed tubes. Consequently the duration of exposure to the heating influences of some portions of the grain would be less than that of other portions, and the heating of the grain would not be performed in a uniform and satisfactory manner.

The object of the present invention is to regulate the passage of grain through the heater in order that the bulk of the grain may be evenly exposed to the heating influences.

With this principal end in view the invention consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings the invention has been illustrated as applied to the improved grain heater and drier for which application for Letters Patent of the United States, Serial No. 222,009, was filed by myself on the 24th day of August, 1904, the drawing illustrating a simple and preferred form of embodiment of the invention, with the understanding, however, that no limitation is necessarily made to the precise structural details therein exhibited, but that the right is reserved to any changes, alterations, and modifications to which recourse may be had within the scope of the invention and without departing from the spirit or sacrificing the efficiency of the same.

In said drawings, Figure 1 is a vertical sectional view of a grain-heater to which the present improvement has been applied. Fig. 2 is a perspective view showing the conical regulator detached. Fig. 3 is a sectional detail view of the conical regulator. Fig. 4 is a sectional view illustrating a modification of the same.

Corresponding parts in the several figures are indicated by like characters of reference.

A drum or cylinder 1 constitutes the casing of the heater, which is provided at its upper end with an inlet-hopper 2 and at its lower end with a funnel-shaped discharge-chute 3. The casing has a pair of diaphragms 5, which are connected by a plurality of tubes 6 for the passage of grain. The casing has a steam-inlet 7 and an outlet 8, and through the diaphragms extends a vertical spring-supported rod 9, provided above the supporting-spring 10 with a washer 11 and an adjusting-nut 12, the spring 10 being disposed within a tube 13, extending upwardly from the upper diaphragm 4. The rod 9 carries at its lower end a conical regulator 14. Below the opening 15 at the lower end of the exit-chute 3 is a conical valve 16, mounted upon a spring-supported rod 17, connected with brackets 18 upon the sides of the casing. The spring-supported rod 17 has an adjusting-nut 19.

The office of the regulator 14 is to control the passage of grain through the tubes 6. In my copending application, to which reference has been made above, the said regulator has been shown as being of a plain conical shape; but experience has proven that under some circumstances it would be inadequate to prevent the too-rapid passage of grain through the centrally-disposed tubes of the heater, and especially through such intermediate tubes as may be disposed directly above the outer rim or margin of the conical regulator. To increase the efficiency of said regulator, I have provided the same with an annular obstruction, which, as shown in the accompanying drawings in Figs. 1, 2, and 3, may be in the nature of a wire of suitable dimensions, soldered or otherwise secured near the margin of the regulator. In Fig. 4 has been illustrated a slight modification which consists in

forming the annular obstruction by slightly upturning the lower edge of the regulator to form a marginal flange 21. In said Fig. 4 I have also incidentally shown the body of the regulator as being annularly corrugated, as indicated at 22, the object being simply to retard the passage of grain over the regulator.

It will be understood that when the device is in operation the entire casing, including the discharge-funnel 3, the tubes 6, and the hopper 2, will be kept practically filled with grain, which is supplied to the hopper at approximately the same rate at which it escapes at the bottom of the discharge-funnel, the opening 15 of the latter being regulated by proper adjustment of the conical valve 16. It is obvious that if no obstruction were present in the funnel-shaped portion 3 of the casing the tendency of the grain would be to pass in the most direct way to the outlet—that is, through the tubes disposed approximately centrally in the casing. A current being set up through these tubes there would be little or no flow through the tubes disposed near the periphery of the casing, and the result would be that a portion of the grain would not be sufficiently dried, while another portion would be excessively dried. By the use of a plain conical regulator, as shown in my pending application above referred to, partial regulation of the flow may be attained; but practical experience has demonstrated that by providing the regulator with an annular obstruction and, if desired, with auxiliary obstructions on the face thereof the passage of grain through the tubes of a grain-heater constructed on the general lines illustrated in the drawings may be regulated to such an extent that the bulk of the grain passing through

such heater will be equally heated throughout and the most satisfactory results attained.

While I consider this invention especially adapted to the form of heater herein shown and described, it may be applied to various other forms of heaters with equally satisfactory results.

Having thus described the invention, what is claimed is—

1. The combination with a casing having a grain-passage, of an adjustable spring-supported conical regulator disposed adjacent to the outlet and having an annular obstruction.

2. A heater-casing having a plurality of tubes for the passage of grain, and a regulator supported below said tubes, said regulator consisting of a cone having an annular obstruction.

3. A grain-tube having a plurality of tubes for the passage of grain, and a conical regulator supported below said tubes, said regulator being provided upon the face thereof with obstructions to retard the passage of grain.

4. In a grain-heater, a cylindrical casing having an inlet-hopper and an outlet-funnel, diaphragms in said casing, grain-tubes connecting said diaphragms, and a conical regulator supported centrally below said grain-tubes, said regulator being provided with an annularly-supported obstructing-wire.

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:

W. C. KUHNKE,
CHAS. J. FRICKER.