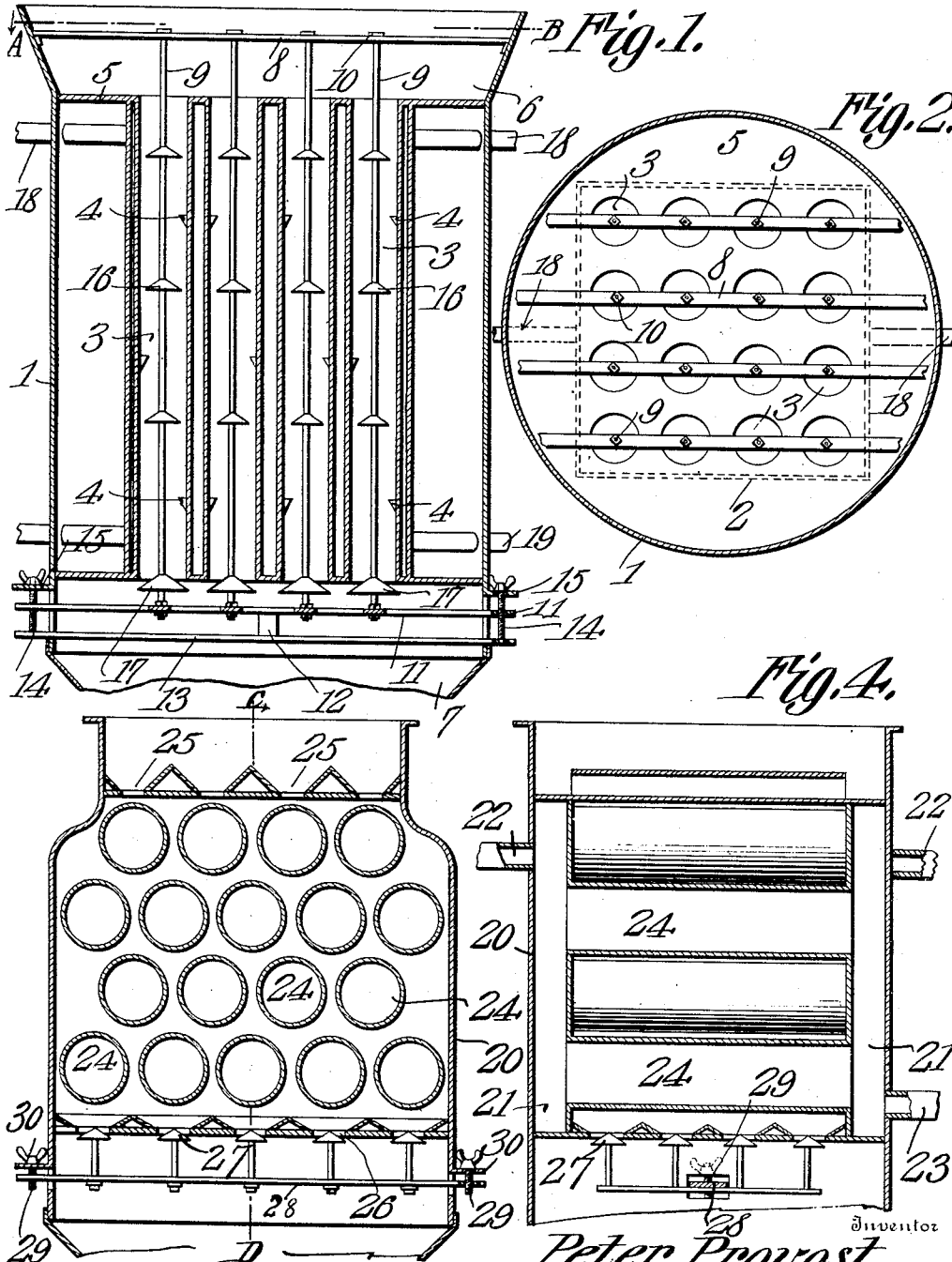


P. PROVOST.  
GRAIN DRIER.

APPLICATION FILED MAR. 23, 1909.

940,190.

Patented Nov. 16, 1909.



Witnesses  
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# UNITED STATES PATENT OFFICE.

PETER PROVOST, OF MILWAUKEE, WISCONSIN.

GRAIN-DRIER.

940,190.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed March 23, 1909. Serial No. 485,248.

*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, of which the following is a specification.

This invention relates to grain driers of that type in which the grain is directed through a plurality of passages extending from end to end of a heating drum. Devices of this character such as heretofore devised have utilized controlling means for retarding the passage of grain through the various tubes or flues provided for that purpose, but these controlling means have been of such a character as to render it impossible to so regulate the grain as to cause it to flow with the same speed and in the same quantities at all times through all of the flues. As heretofore constructed heating devices of this type often become clogged and the grain in certain of the tubes thus becomes heated to a greater extent than the grain in the other tubes and an unsatisfactory product is thus obtained.

The object of the present invention is to provide novel means for regulating the flow of grain through the various flues or tubes of the heater, said means being simultaneously adjustable so as to permit the uniform passage of grain through the flues.

Another object is to provide improved means for turning or agitating the grain as it passes through the flues, so as to bring all portions of the grain into contact with the heated surfaces.

With these and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims.

In the accompanying drawings the preferred forms of the invention have been shown.

In said drawings:—Figure 1 is a central vertical section through a heater embodying the present improvements. Fig. 2 is a section on line A—B Fig. 1. Fig. 3 is a central vertical section through a modified form of heater. Fig. 4 is a section on line C—D Fig. 3.

Referring to the figures by characters of reference 1 designates a casing which is preferably cylindrical in form and surrounds a rectangular body 2, through which

extend series of parallel tubes or flues 3 each of which is provided at desired points upon its inner surface with projections or baffles 4. These tubes are secured at their ends within heads 5 which close the ends of the body 2. A hopper-like receiver 6 is located at the upper end of the body and the lower end of said body opens into a discharge hopper 7 which may be of any preferred construction. A frame 8 is supported transversely within the receiver 6 and extending through this frame are supporting wires 9 which extend longitudinally within the respective tubes 3. These wires or rods 9 are slidably mounted within the frame 8 and are engaged by nuts 10. The lower ends of the said wires or rods extend into and are fixedly secured in any desired manner to a frame 11 suspended within the hopper 7 and having a central knob or projection 12 which bears upon a cross-bar 13. The ends of this bar extend through opposite sides of the casing 1 and are supported by means of adjusting bolts 14 engaging ears 15 which outstand from the casing 1. Each of the wires or rods 9 has a series of conical baffles 16 thereon and which coöperate with the baffles 4 for the purpose of turning the grain as it passes downward through the tubes. Each wire or rod 9 is also provided adjacent its lower end with a conical shut-off valve 17 designed, when the wires or rods are elevated, to close the tube thereabove or to retard the discharge of grain from the tube. Steam inlet and outlet ports 18 and 19 are provided within the body 2, and it will be therefore apparent that when steam is circulating from the inlet port to the outlet port it will pass between the various tubes within the body and thoroughly heat them.

When grain is admitted to the receiver 6 it will of course flow into the tubes 3 and drop upon the baffles 4 and 16 and thus be turned so as to bring all portions thereof into contact with the heating surfaces of the tubes. The grain will pass outward from the lower ends of the tubes and will be deflected by the valves 17. By means of the nuts 10 the various wires or rods 9 can be adjusted longitudinally so as to bring all of the valves the same distances from the lower ends of their respective tubes. The grain is thus permitted to discharge from all of the tubes in the same quantities, and this quantity can be regulated to suit the capacity of the mill

with which the device is used. By providing the cross-bar 13 the frame 11 and the valves 17 can be shifted by means of the bolts 14 so as to quickly clear the lower ends of the tubes should they in any wise become clogged. It will be obvious however that this clogging will very rarely occur.

Instead of providing tubes for conveying grain through the heater the tubes can be utilized for conveying steam or any other heating medium, as indicated in Figs. 3 and 4. By referring to these figures it will be seen that the casing 20 is provided at opposite sides with steam compartments 21, provided with inlet ports 22 and an outlet port 23, these two compartments communicating through tubes 24 which extend horizontally between the grain inlets 25 and grain outlets 26 of the device. The inlets are in the form of hoppers for directing grain on to the tubes, which tubes thus act as baffles for the purpose of turning the grain as it falls downwardly through the casing.

As shown in Fig. 3 the tubes are preferably arranged in staggered relation so that it thus becomes impossible for any of the grain to pass from the inlet to the outlet without coming into contact with a number of the tubes. Each of the outlets is in the form of a hopper and is closed by means of a conical valve 27 supported by a cross-bar 28 which is adjustably supported in any preferred manner as by means of bolts 29 carried by ears 30 which extend outwardly from the casing 20.

It is of course to be understood that various other changes may be made in the construction and arrangement of the parts without departing from the spirit or sacrificing the advantages of the invention.

What is claimed is:—

1. In a device of the class described a casing having grain inlets and outlets, grain-heating devices interposed between said inlets and outlets, a separate valve for each outlet, and means for adjustably supporting

the valves, and means for simultaneously shifting said valves.

2. In a device of the class described a casing having grain inlets and outlets, means interposed between said inlets and outlets for heating grain, separate valves upon the outlets, and a series of baffle devices connected to each valve.

3. In a device of the class described a casing having grain inlets and outlets, grain-heating devices interposed between said inlets and outlets, a valve for each outlet, baffles connected to each of the valves, and means for simultaneously shifting the valves and baffles.

4. A grain-heater comprising a casing having grain inlets and outlets, tubular connections between said inlets and outlets, a valve for each outlet, an adjustable support for each valve, and means for simultaneously shifting all of the valves.

5. A grain-drier comprising a casing having grain inlets and outlets, tubes connecting said inlets and outlets, a supporting frame, a valve adjacent the outlet of each tube, adjustable connections between the valves and the frame, said connections extending longitudinally within the tubes, baffles carried by the connections, and baffles within and fixed relatively to the tubes.

6. A grain-drier comprising a casing having grain inlets and outlets, tubes connecting said inlets and outlets, a supporting frame, a valve adjacent the outlet of each tube, adjustable connections between the valves and the frame, said connections extending longitudinally within the tubes, baffles carried by the connections, baffles within and fixed relatively to the tubes, and means for simultaneously shifting all of the valves.

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:

J. L. LA BOULE,  
H. T. ATTERMEIER.