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H. F. PIETSCH.

GRAIN HEATER.

APPLICATION FILED DEC. 8, 1905.

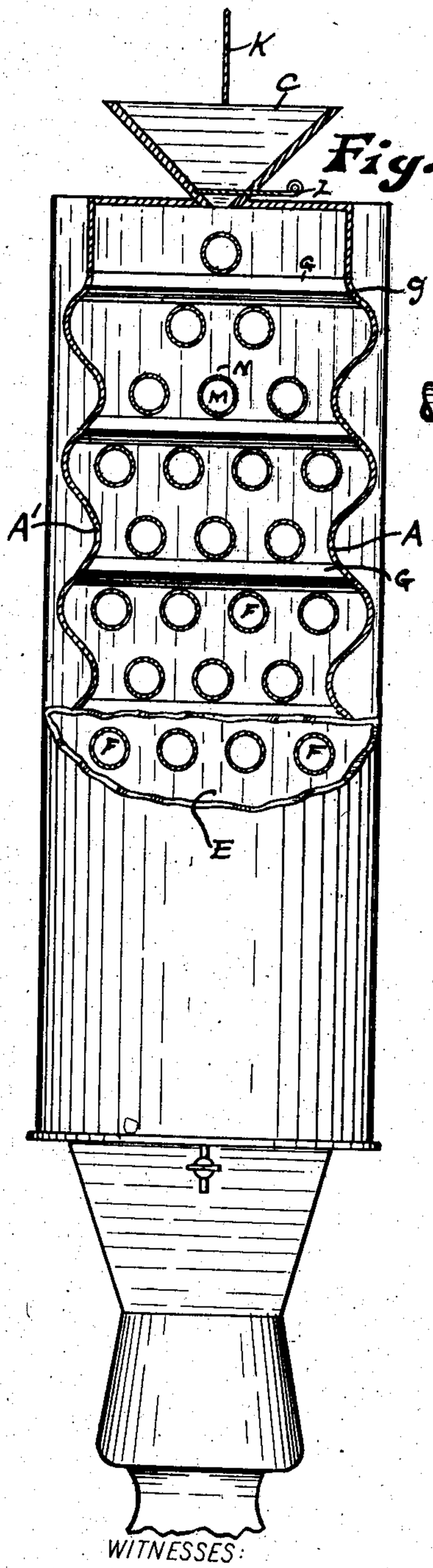


Fig. 1.

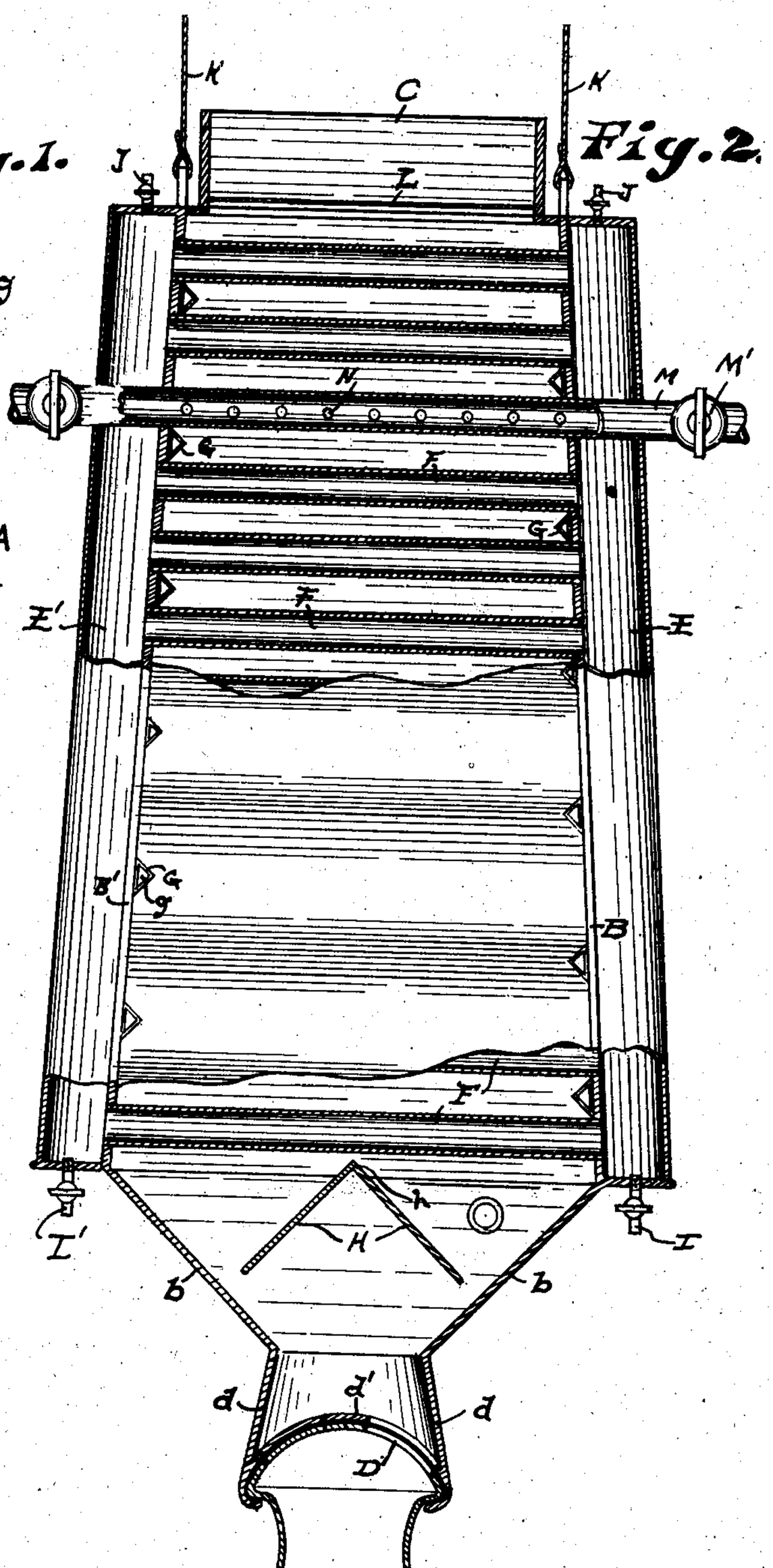


Fig. 2.

WITNESSES:

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## GRAIN-HEATER.

No. 833,847. Specification of Letters Patent. Patented Oct. 23, 1906.

Application filed December 8, 1905. Serial No. 290,936.

*To all whom it may concern:*

Be it known that I, HERMAN F. PIETSCH, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Grain-Heaters, of which the following is a specification.

My invention relates to improvements in grain-heaters.

The object of my invention is to provide means for steaming and heating grain, in which all portions of the grain while being treated will be continuously stirred, turned, and deflected to other portions of the heating-chamber, whereby all the grains will be uniformly treated.

A further object of the invention is to provide effective means for steaming the grain after it has been warmed preparatory to the steaming operation.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is an elevation of a wheat-heater embodying my invention with the upper portion shown in vertical section cutting the steam-tubes transversely. Fig. 2 is a view at right angles to that of Fig. 1 and showing both the upper and lower portion of the apparatus in vertical section.

Like parts are identified by the same reference characters in both views.

A heating-chamber formed with corrugated walls A A′ and downwardly-diverging walls B B′ receives the wheat at its upper end through a hopper C and discharges it through a valve D at its lower end. The lower end portion of the chamber is provided with converging walls *b*, connected with the diverging walls *d* of the valve-chamber. The walls *d* diverge downwardly and conically and support a concave seat *d′*, to which the valve D is fitted. The lower edges of the valve-casing *d* are turned inwardly, as shown, and form a rest for an overhanging portion of the valve D.

Steam-chests E E′ are formed on the walls B B′, respectively, and these chests communicate with each other by means of pipes F, extending through the walls B B′ and crossing the heating-chamber.

Referring to Fig. 1, it will be observed that these pipes F are arranged in horizontally-disposed sets, and the pipes of each alternate set are arranged in the vertical plane of the spaces between the pipes of the preceding set, whereby the grain in passing downwardly between the pipes of one set is divided and deflected by the pipes of the next set, the pipes being preferably arranged to extend substantially parallel to the corrugations in the walls A A′, and the inward bends of these corrugations extend between the pipes of the alternate sets with space between them and the adjacent intermediate pipes substantially equal to the dimensions of the spaces between the pipes, whereby the wheat passing downwardly along the walls A A′ is deflected inwardly and caused to pass between the pipes.

The walls B B′ are provided at intervals with deflectors G, preferably composed of two angularly-disposed walls extending outwardly and convergingly from the wall B or B′ and form a triangle in cross-section which extends across the chamber transversely to the tubes F and preferably opens to the exterior at each end, whereby a circulation of air is permitted through passages *g*. A shed H is also provided between the walls *b*, which extends transversely across the heating-chamber underneath the tubes F with its apex *h* in close proximity to the lower set of tubes. The side walls of the shed extend outwardly in the direction of the walls *b*, whereby the wheat is permitted to reach the valve-chamber only by passing along these walls. This shed supports the central portion of the wheat column to some extent and counteracts the friction of the side walls A A′ and B B′, which would otherwise result in an unequal treatment of the grain by permitting a more rapid flow at the center than at the sides.

Steam is admitted to the steam-chests through a valved inlet-pipe I and exhausts through a similar outlet-pipe I′, a circulation of steam being thus produced through pipes F, which lead from one to the other. The upper ends of the steam-chests are provided with petcocks J, by means of which the chests may be relieved of air when starting the apparatus. K represents ropes for suspending the apparatus underneath the elevator-spout or in any position of use, and L is a slide-valve controlling the flow of wheat through the hopper.

When it is desired to steam the wheat, the steam may be admitted directly to the heating-chamber through a pipe M, which is provided with a valve at M′ and which extends through the steam-chests E E′ and through the heating-chamber. Within the heating-chamber the pipe M is provided with a series

of perforations N, which permits the discharge of steam into the wheat while the latter is passing over and around the pipes F. The pipe M crosses the heating-chamber in a central vertical plane thereof and occupies the position of one of the pipes F for which it is substituted. It is preferably located below the upper sets of pipes F, so that the wheat may be heated to some extent preparatory to the steaming operation.

With the described construction it will be observed that the wheat passing through the heating-chamber is continuously deflected inwardly and outwardly by the side walls A A′ and by the deflectors G, the latter serving to keep those grains from being overheated, which would otherwise follow the walls B B′. By making the walls B B′ outwardly divergent all tendency to clog is obviated. This is of especial importance when the steaming operation is being performed, since the steam tends to swell the grain.

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

1. In a grain-heater, the combination of a chamber formed with downwardly-divergent walls and corrugated connecting-walls; steam-chests formed on the downwardly-divergent walls; tubes crossing said chamber and communicating between the steam-chests; and means for delivering grain to the upper end of said chamber, and permitting its discharge from the lower end.

2. In a grain-heater, the combination of a chamber formed with downwardly-divergent walls and corrugated connecting-walls; steam-chests formed on the downwardly-divergent walls; tubes crossing said chamber and communicating between the steam-chests; and means for delivering grain to the upper end of said chamber, and permitting its discharge from the lower end, said pipes being arranged substantially parallel to the corrugations in the connecting-walls, with the outer pipes of alternate sets partially within the outward bends of the corrugations and those of the intermediate sets opposite the inward bends.

3. In a grain-heater, the combination of a chamber formed with downwardly-divergent walls and corrugated connecting-walls; steam-chests formed on the downwardly-divergent walls; tubes crossing said chamber and communicating between the steam-chests; and means for delivering grain to the upper end of said chamber, and permitting its discharge from the lower end, said divergent walls being provided with deflecting-shields extending transversely to the tubes along the divergent walls.

4. In a grain-heater, the combination of a chamber formed with downwardly-divergent walls and corrugated connecting-walls; steam-chests formed on the downwardly-divergent walls; tubes crossing said chamber and communicating between the steam-chests; and means for delivering grain to the upper end of said chamber, and permitting its discharge from the lower end, said divergent walls being provided with hollow deflecting-shields forming transverse air-passages extending transversely to the tubes along the divergent walls.

5. In a grain-heater, the combination of a chamber crossed by sets of substantially parallel transverse tubes, with the tubes of intermediate sets below the spaces between the tubes above them; walls arranged to deflect grain in said chamber inwardly between the tubes of each successive set; and means for passing steam through the tubes.

6. In a grain-heater, the combination of a chamber crossed by sets of substantially parallel transverse tubes with the tubes of intermediate sets below the spaces between the tubes above them, walls arranged to deflect grain in said chamber inwardly between the tubes; and means for passing steam through the tubes; said chamber having a conically-tapered lower portion provided with a curved valve-seat and a valve fitting said seat, and supported by the marginal edges of said lower portion of the chamber.

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

HERMAN F. PIETSCH.

Witnesses:

JAS. B. ERWIN,

ALBERT PIETSCH.