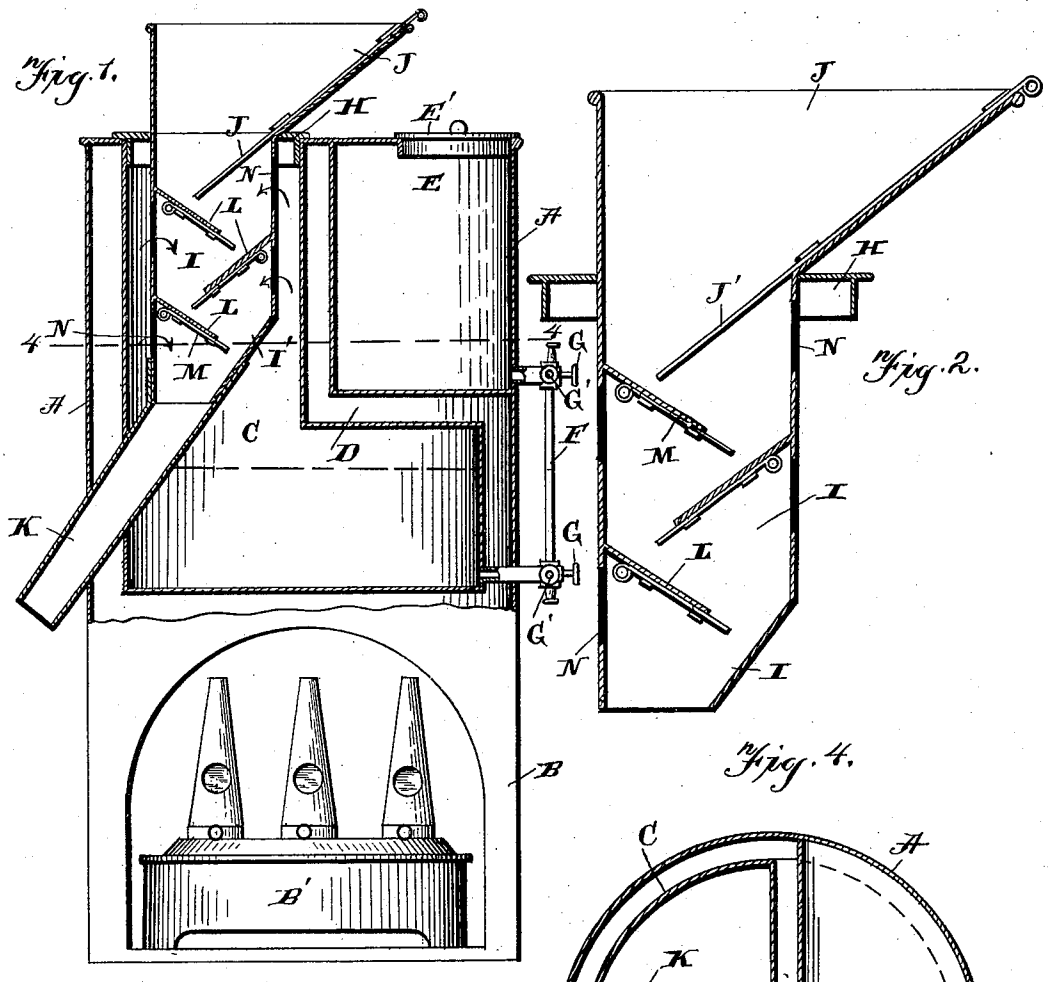
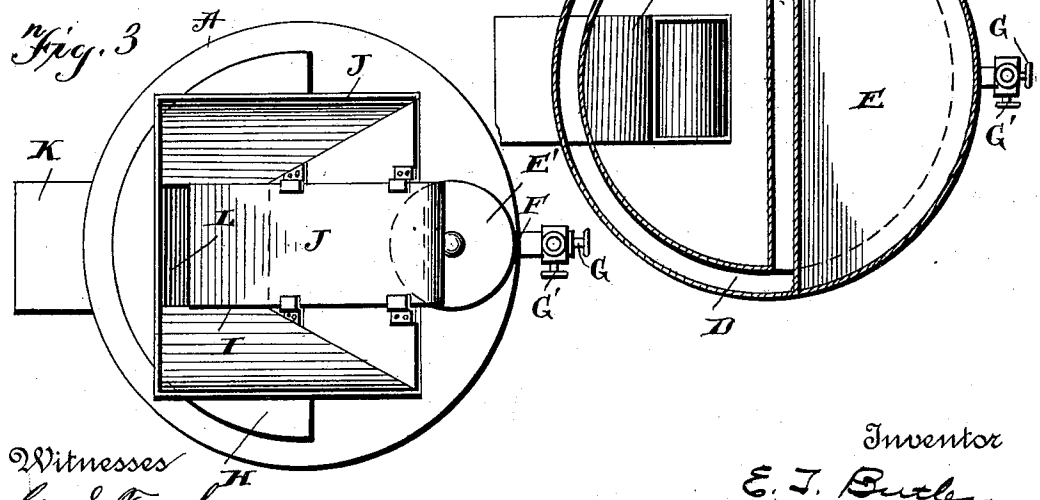
(No Model.)

E. T. BUTLER.

GRAIN STEAMER.

No. 589,334. Patented Aug. 31, 1897.





Witnesses
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UNITED STATES PATENT OFFICE.

ELI T. BUTLER, OF PHILADELPHIA, PENNSYLVANIA.

GRAIN-STEAMER.

SPECIFICATION forming part of Letters Patent No. 589,334, dated August 31, 1897.

Application filed January 30, 1897. Serial No. 621,309. (No model.)

To all whom it may concern:

Be it known that I, ELI T. BUTLER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Steamers; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to grain-steamers; and the object is to provide an apparatus of improved form and of simple and inexpensive construction for thoroughly and effectually subjecting grain to the action of steam for toughening it before grinding.

The invention consists in the novel features of construction hereinafter fully described and claimed and illustrated by the accompanying drawings, in which—

Figure 1 is an elevation of the apparatus, a portion of the same being in vertical section. Fig. 2 is a sectional view of the hopper and chute. Fig. 3 is a plan view of the steamer. Fig. 4 is a sectional plan view on line 4 4, the hopper and chute being removed.

A designates the outer shell or casing of the steamer, open at its lower end at B to receive lamp-stove B′ or other heating mechanism. Suspended from the top of the shell is the L-shaped boiler C, surrounded by air-space D, which affords free circulation of heat around the same. In the upper portion of the shell and overhanging the boiler is feed-water reservoir E, which communicates through gage-tube F with boiler C, the tube serving the double function of passing water to the boiler and indicating the height of the water therein. Valves G are arranged as usual in conjunction with the tube, as are also lesser valves G′. Shell A forms the outer wall of reservoir E, as shown, and the same is provided with top door E′. While the heat from the lamp does not act directly on said reservoir, as on the boiler, yet the hot air passing upward through the air-space surrounding the boiler has the effect of warming the feed-water.

H is the removable top for the boiler, and secured thereto and depending therethrough in the boiler is chute I, having hopper J, extending above the structure. The inner side of the lower end of the chute is cut away at I′ to fit in the inner enlarged end of inclined discharge-spout K, the spout being fixed in openings in the boiler and casing. Within the chute are the oppositely-inclined shelves L, arranged alternately on opposite sides, and on the under side of each shelf is a slide or extension-piece M. Steam-inlet openings N are formed in the chute behind the shelves. Slide J′ in hopper J regulates the amount of grain fed into the chute.

In operation steam is generated, which rises to the upper part of the boiler and surrounds the depending chute and enters therein through openings N and acts directly on the grain as it drops from one shelf to another. The grain is turned over and over in passing down the inclined shelves, and slides or extension-pieces M regulate the depth or volume of grain passing through, permitting a greater or less flow, as desired. The grain having been thus thoroughly subjected to the action of steam is discharged through spout K to the first break-roll. Water is fed to the boiler as needed through the glass gage-tube from the reservoir E.

Various means are employed to toughen the outer covering of wheat to prevent abrasion during the process of breaking and reducing to flour. In some cold water is used, a slow process which requires much handling and time for the wheat to absorb the necessary moisture. A quicker method contemplates the use of hot water, which does the work very unevenly, wetting some kernels more than others. Steam is also extensively used under considerable pressure, and though a better method of treating the grain than those just mentioned requires much attention to regulate properly. I prefer to use steam under no pressure and immediately applied to the grain, as contemplated by the apparatus herein shown and described, when the surface of the kernels is thoroughly exposed to the moisture, which is quickly absorbed. The grain is thus very effectually and rapidly treated, there being a continuous flow of the same through the steamer from hopper J to the first break-roll of the mill.

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

1. An improved grain-steamer, comprising a generator formed with an open vertical extension which constitutes a steam-chamber, a removable cover for the chamber, a chute carried by the cover and depending into the chamber and open thereto, and a discharge for the chute, substantially as shown and described.

2. An improved grain-steamer, comprising an outer shell or casing, a generator therein and removed from the upright walls of the casing whereby the same is surrounded by an air-space, a heater beneath the generator, and a grain passage-way through the upper portion of the generator and open thereto to admit steam which acts on the grain, substantially as shown and described.

3. An improved grain-steamer, comprising a shell or casing, an L-shaped steam-generator therein, a feed-water reservoir overhanging the horizontal portion of the generator but separated therefrom to form an air-circulating space, a grain passage-way through the upper portion of the generator to subject the grain to the action of the steam, and a heater beneath the generator, substantially as shown and described.

4. An improved grain-steamer, comprising an outer shell or casing, a steam-generator therein, means for subjecting the grain to the action of the steam, and a feed-water reservoir having its outer wall formed by the shell or casing and at its inner side separated from the generator by an air-space, substantially as shown and described.

5. The combination of the outer casing or shell a steam-generator and an elevated feed-water reservoir within the casing, and a transparent gage-tube for passing water from the reservoir to the generator and also for indicating the height of water in the latter, substantially as shown and described.

6. The combination of a generator, an elevated feed-water reservoir, and a valved gage-tube for passing water from the reservoir to the generator and for indicating the height of the water in the generator, substantially as shown and described.

7. The combination of a casing, a heater at the base thereof, a steam-generator and a feed-water reservoir depending into the casing and closing the upper end thereof, and a grain-chute extending through the upper portion of the generator and open thereto above the water-line, substantially as shown and described.

8. In a wheat-steamer, the combination of a generator open at its upper end, an outwardly-extending spout permanently secured in the wall thereof, a vertically-elongated chute open from end to end and adapted to be removably positioned in the upper portion of the generator with its lower end uniting with the upper end of the spout, the opposite sides of the chute being slotted to admit steam, and the inclined oppositely-extending shelves secured to opposite sides of the chute above the slots and adapted to interrupt the grain and cause it to follow a zigzag course downward through the chute, substantially as shown and described.

9. In a wheat-steamer, the combination of a steam-chamber, a spout leading therefrom, a chute depending in the chamber and at one side contracted to fit within the spout, said contracted side forming a shelf or inclined surface to deflect the grain before finally passing to the spout, the oppositely-inclined shelves within the chute above said inclined lower end, to divert the grain in zigzag course before reaching said inclined surface, the chute being open to the steam-chamber, substantially as shown and described.

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

ELI T. BUTLER.

Witnesses:
JOHN ADAMS,
SAMUEL BAKER.