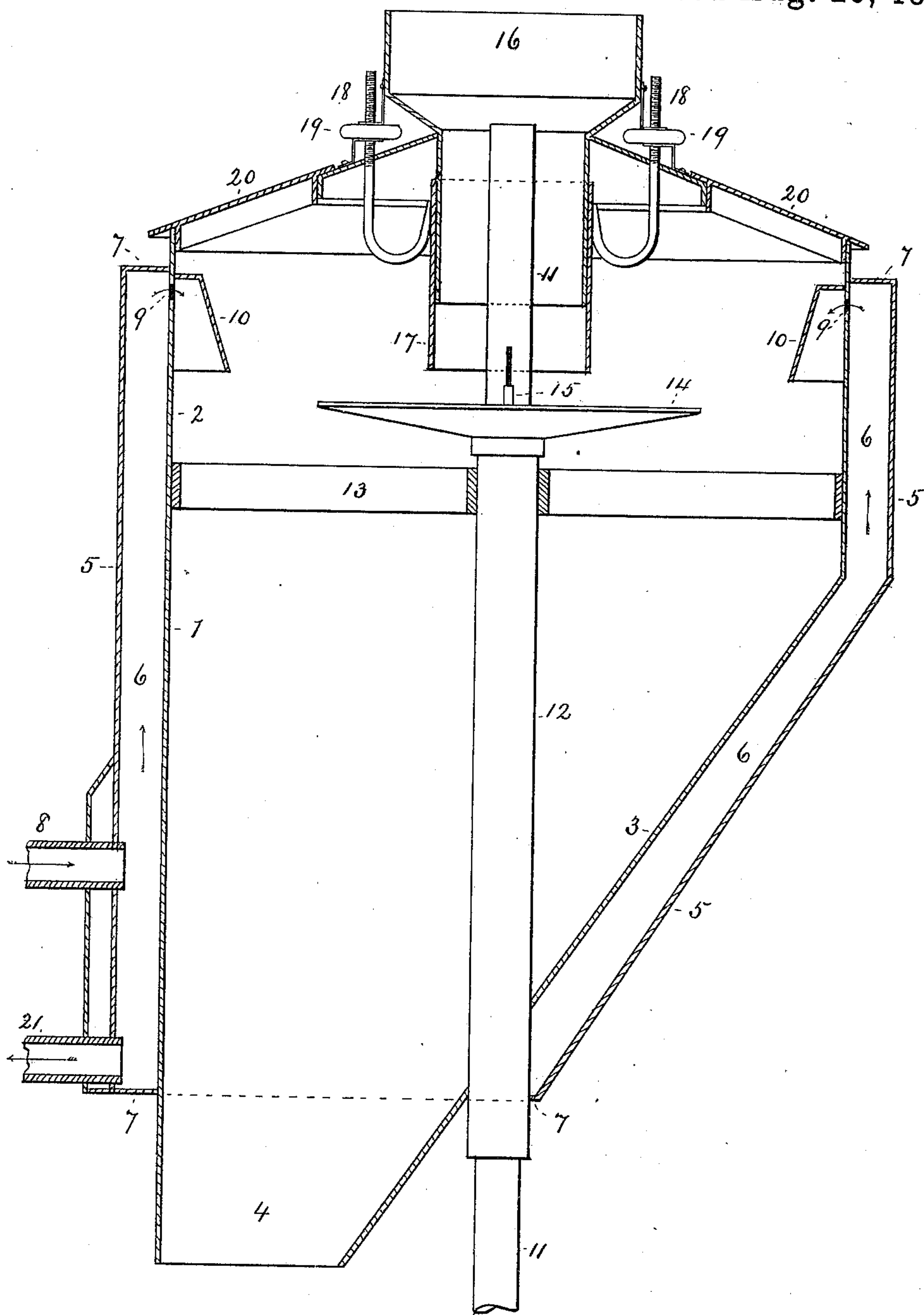


(No Model.)

E. E. HORNER.
WHEAT STEAMER.

No. 566,317.

Patented Aug. 25, 1896.



Witnesses

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UNITED STATES PATENT OFFICE.

ELMER E. HORNER, OF FARIBAULT, MINNESOTA.

WHEAT-STEAMER.

SPECIFICATION forming part of Letters Patent No. 566,317, dated August 25, 1896.

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To all whom it may concern:

Be it known that I, ELMER E. HORNER, a citizen of the United States, residing at Faribault, in the county of Rice and State of Minnesota, have invented certain new and useful Improvements in Wheat-Steamers, of which the following is a specification.

My invention relates to an apparatus for subjecting wheat to the direct action of steam to heat and moisten it preparatory to grinding.

The object of my invention is to provide for heating the casing or chamber through which the wheat is passed by the inflowing steam, and at the same time separating water of condensation from the steam before supplying it to the shower of distributed wheat.

Another object is to provide for distributing the wheat-shower through the heating and steaming chamber and mingling therewith, while in a distributed and falling shower, currents of steam for uniformly heating and moistening it.

Another object is to provide improved details of construction by which the apparatus is made more effective in operation.

The details of construction of my improved apparatus are illustrated in the accompanying drawing, which represents a vertical section thereof.

The casing 1 is constructed with a cylindrical upper portion 2 and a tapering lower portion 3, though one side of the lower portion is made vertical in continuation of the upper cylindrical portion 2, so that the inclined portion 3 shall intersect the central axis of the casing and form with the vertical portion an outlet spout or funnel 4 at one side of the casing, as shown. This construction is provided so as to remove the discharge-funnel 4 from the central shaft 11 and its sleeve 12, and thereby permit an unobstructed discharge-opening for the wheat. A jacket 5, of the same shape as the casing 1 2 3, is joined at the top and bottom to the said casing by annular flanges 7 and is of sufficiently larger diameter to form an intervening steam-space 6. The steam-inlet pipe 8 is connected with the space 6 near the lower end of the jacket, so that the inflowing steam must rise through the space 6 to its upper end before entering the interior of the casing. Around the upper end of the casing are provided a series of open-

ings 9, and on the interior of the casing are attached the downwardly-projecting hoods 10, covering such openings 9, so as to direct the streams of inflowing steam downward into the shower of distributed wheat. The hoods 10 also prevent wheat from being thrown outward through the openings 9 into the steam-space. By connecting the steam-supply pipe 8 with the lower end of the jacket and forming the openings 9 near the top of the casing the steam-space 6 acts as a separator, so as to free excessive moisture or water of condensation from the steam, while the comparatively dry steam only passes upward through the openings 9 into the steam-chamber. A drain-pipe 21 is connected with jacket 5 at the lower extremity of the steam-space 6 for the purpose of conducting off water of condensation.

A vertical shaft 11 is supported centrally in the upper cylindrical portion 2 of the casing by means of the sleeve 12, which is securely held in place by the spider 13. The sleeve 12 passes through the inclined portion 3 of the case and the flange 7, which connects jacket 5 with the casing. In practice the lower end of shaft 11 is provided with a beveled gear which meshes with another beveled gear on a power-shaft (not here shown) for turning the shaft.

A distributing-disk 14 is secured by a key 15 to the upper portion of shaft 11, so as to be a little lower than the lower edge of the steam-distributing hoods 10, as shown in the drawing, so that the wheat, as distributed by the disk, may be subjected in the most favorable manner to the downward currents of steam. This relative arrangement of the distributing-disk and the steam-hoods secures an intimate mingling of the steam with the wheat, so that the latter is uniformly heated and moistened as it falls in a shower to the discharge-spout 4.

A feed-hopper 16 is provided on top of the case, and has a downward cylindrical extension 16^a, to which is applied a vertically-adjustable sleeve 17 for regulating the feed of grain to the distributing-disk 14. To sleeve 17 are attached the curved rods 18, which are screw-threaded at their upper ends and pass upward through the top of the case and through the horizontal lugs, as shown, and

on the screw-threaded portions are applied the nuts 19, working between said lugs, for raising and lowering sleeves 17. By means of these devices the space between the discharge-mouth of the feed-hopper and the distributing-disk may be so regulated as to secure the proper feed of grain to the heating and steaming chamber. A removable cover 20 is provided to give access to the interior of the chamber.

The peculiar shape of the casing, with its lower portion inclined or tapering to form the discharge-funnel 4 at one side of the vertical axis, permits the shaft 11 to be placed centrally to the upper cylindrical portion of the casing and not interfere with the discharge of grain through the funnel 4. The distributing-disk 14 can thus be maintained in a horizontal position and centrally within the cylindrical casing, so as to subject the distributed wheat uniformly to the currents of inflowing steam.

In operating the apparatus the shaft 11 is rotated by suitable gearing to give the disk 14 the proper speed for distributing the grain by centrifugal force toward the wall of the casing. Steam, at the same time, is admitted through steam-pipe 8 to the space 6, thereby heating the walls of the casing, and while flowing upward through said casing the water of condensation is separated, and the steam then flows through the openings 9 and is directed by the hoods 10 down into the distributed wheat as it is thrown off from the disk 14. The wheat thus becomes uniformly

heated and moistened by steam and thence passes out through the discharge-opening 4 to the grinding-mill, crushing-rollers, or other devices.

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

1. In a wheat-steaming apparatus the interior casing having steam-inlet openings near its top, and one or more interior downwardly-projecting hoods over said openings, in combination with means for feeding and distributing wheat through the currents of inflowing steam, a jacket surrounding the casing and forming a steam-space between them, a steam-supply pipe and a discharge-pipe for water of condensation connecting with the jacket near its lower end, substantially as described.

2. In a wheat-steaming apparatus the casing having steam-inlet openings near its top and provided with interior downwardly-projecting hoods over said openings, in combination with a vertical central revoluble shaft, a wheat-distributing disk on said shaft a little below said hoods, and a supply-hopper discharging wheat upon said disk, whereby the wheat, as distributed, is uniformly subjected to the inflowing currents of steam, substantially as described.

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Witnesses:

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