

(No Model.)

2 Sheets—Sheet 1.

H. S. JEWELL.
APPARATUS FOR STEAMING GRAIN.

No. 537,978.

Patented Apr. 23, 1895.

FIG:1.

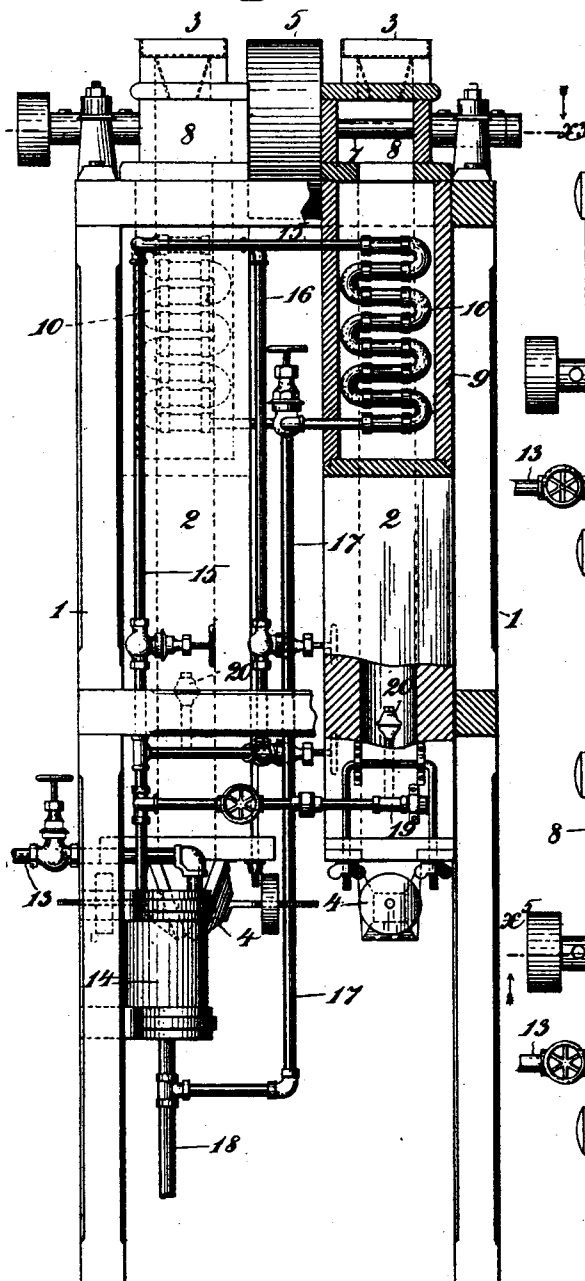


FIG:2.

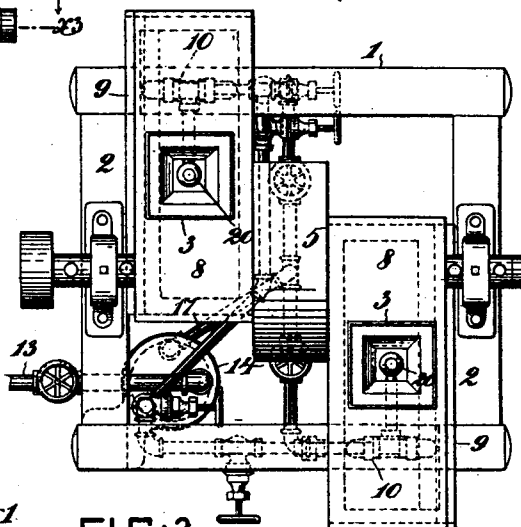
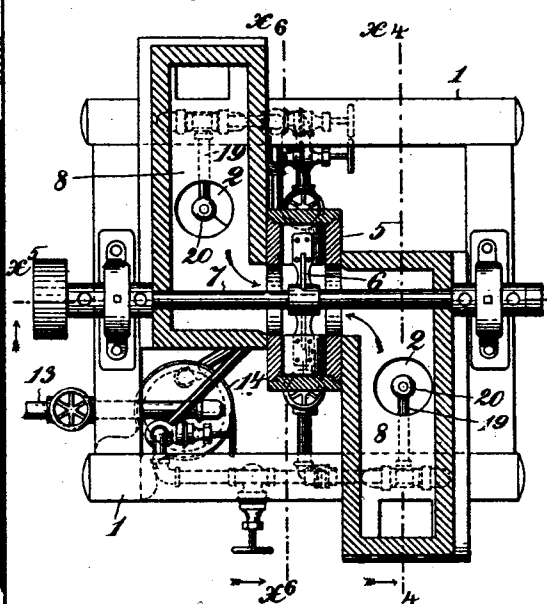


FIG:3.



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His Attorney

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2 Sheets—Sheet 2.

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FIG:4.

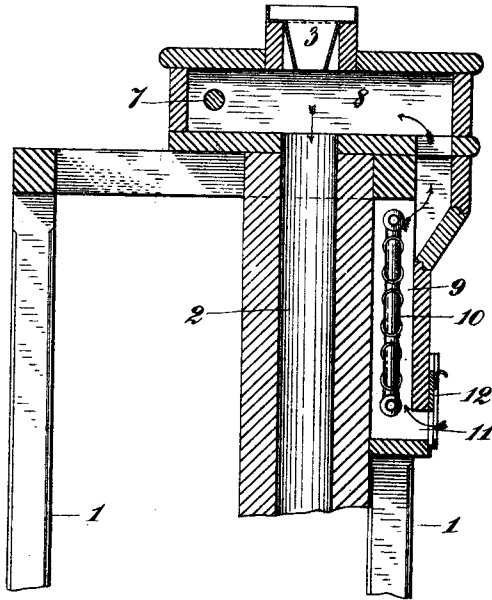


FIG:5.

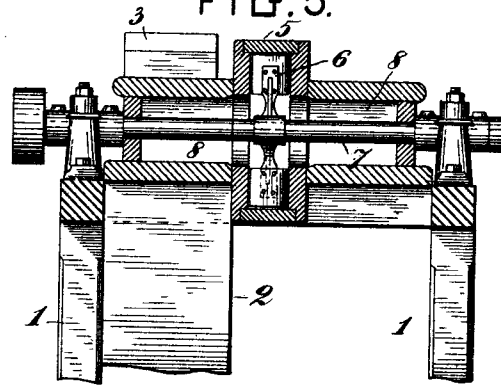


FIG:6.

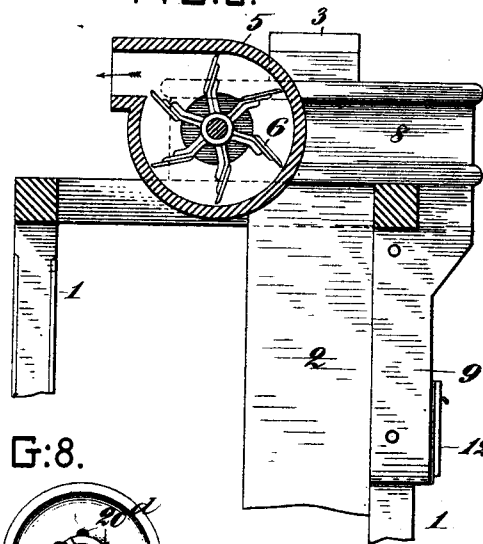


FIG:7.

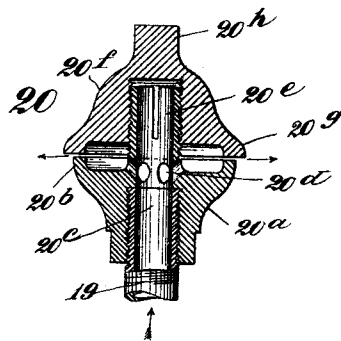
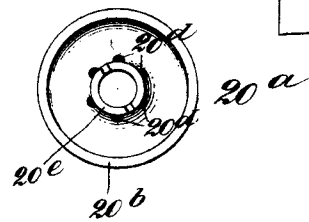


FIG:8.



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UNITED STATES PATENT OFFICE

HERBERT S. JEWELL, OF BROOKLYN, NEW YORK.

APPARATUS FOR STEAMING GRAIN.

SPECIFICATION forming part of Letters Patent No. 537,978, dated April 23, 1895.

Application filed June 20, 1894. Serial No. 515,101. (No model.)

To all whom it may concern:

Be it known that I, HERBERT S. JEWELL, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Apparatuses for Steaming Grain, of which the following is a specification.

My invention relates to means employed for steaming wheat in order to toughen the bran before grinding, and particularly to that class of such apparatuses of which the device illustrated in my United States Patent No. 484,099, of October 11, 1892, is a type. In that device the grain is allowed to fall in a shower down through an upright conduit across which, near its top, a draft is created by a fan or other means, to carry away the dust, and through which conduit a jet of steam is projected in an upward direction to steam the falling grain, the fan removing the surplus steam along with the dust. At the bottom of the conduit is an automatically-regulated outlet-valve to form a grain seal. I employ these general features in my present apparatus, with additions and improvements which will be hereinafter fully described and their novel features carefully defined in the claims.

In the accompanying drawings, wherein I have illustrated an embodiment of the invention,—Figure 1 is a side elevation of the apparatus, broken away in parts to disclose the interior construction. Fig. 2 is a plan of the apparatus. Fig. 3 is a horizontal section in the plane indicated by line x^3 in Fig. 1. Figs. 4, 5 and 6 are vertical sections of the upper part of the apparatus in the planes indicated, respectively, by lines x^4 , x^5 and x^6 in Fig. 3. Fig. 7 is a vertical axial section of the steam-jet nozzle, detached and on a large scale, and Fig. 8 is a plan of the lower or base portion of the same.

The general object of this class of steaming apparatuses is to steam the grain properly and yet avoid excessive condensation of the steam in the conduit and passages of the apparatus, and it is found that a construction which will operate with some success in the warmer seasons will permit of too much condensation in the colder seasons; and one of the objects of my present invention is to provide

means for maintaining a current of heated air or other gas over the top of the conduit, whereby the surplus steam from the same is carried away without injurious condensation in the passages.

Another object is to provide an improved nozzle for the steam jet whereby the amount of steam emitted may be carefully regulated and whereby the steam may be the better distributed throughout the area of the conduit.

Another object is to combine in one structure two or more conduits and their appurtenances connected with one exhaust fan, thus economizing in cost and increasing the effectiveness of the apparatus.

1 represents an open frame which may be of wood and rectangular in plan. In the diagonally opposite corners of this frame are mounted two like conduits, 2, each provided at its top with a suitable hopper, 3, to receive the grain. Each conduit is an upright tube of wood, which will be lined, by preference, with sheet copper. At its bottom the conduit is provided with an automatically operating outlet valve, 4, (Fig. 1) like, or similar to that described in my former patent.

In the top of the frame is mounted a casing, 5, containing an exhaust fan, 6, mounted on a rotating shaft, 7, in the frame. The fan casing is connected by air-conduits, 8, with two chambers, 9, each of which contains a steam coil, 10, arranged adjacent to the upper part of a conduit 2. The air enters the lower part of the chamber 9, at an inlet, 11, controlled by a sliding wicket, 12, and ascends about the coil 10, and to the air-conduit 8, passing over the upper end of the steaming conduit 2, and between the latter and the bottom of the hopper 3. This construction is best seen in Fig. 4.

Steam from a boiler or generator arrives by way of a main steam pipe, 13, and enters a drying drum, 14, mounted on the frame. From the drum 14, a steam pipe, 15, extends upwardly and connects with the upper end of one of the coils 10, and a branch, 16, from the pipe 15 extends up to and supplies steam to the upper end of the other coil 10. The lower ends of both coils 10 are connected by branch pipes with a pipe, 17, which extends down to and is connected with the outlet pipe, 18, at

the bottom of the drying drum 14. Branch pipes, 19, lead from the live steam pipe or pipes into the respective steaming conduits 2, at the lower parts thereof, and on the up-
 5 turned ends of these branches are screwed the respective steam-jet nozzles, 20, in the said conduits.

Suitable cocks are provided for regulating the supply of steam to the apparatus, to the
 10 coils, and to the jet-nozzles. The drawings show a satisfactory arrangement of the steam pipes and valves, but this may be varied without departing from my invention.

Figs. 7 and 8 illustrate the construction of
 15 the steam jet-nozzle 20. The base portion, 20^a, is circular in plan, has a socket in its bottom to receive the branch steam pipe 19, a raised, marginal flange, 20^b, a central steam-passage, 20^c, small outlet apertures, 20^d, for
 20 the steam, and a screw-threaded nipple, 20^e, to receive the upper part or hood, 20^f. This latter is a little larger in diameter than the base portion 20^a, and is shaped conical so as to shed the grain that falls on it from above.
 25 This overhang prevents the narrow outlet from getting choked with flying particles. The hood has also a pendent marginal flange, 20^g, and a square, 20^h, at its crown, for applying a wrench to screw it down. By screwing
 30 down the hood 20^f more or less, the marginal radial outlet for the steam, may be made narrower or wider, as desired, and this may be done from the top of the conduit by means of a long handled socket wrench. The steam enter-
 35 ing the nozzle from below is emitted radially in a sheet through the slit or outlet between the marginal flanges on the parts.

In order that the hood may not work loose on the nipple, I prefer to make the latter tubu-
 40 lar, as shown, and slit it at its upper part.

In the operation of the apparatus the air drawn over the upper end of the steaming conduits by the fan must pass first about the coils 10, where it becomes heated, and by this means
 45 it is made to take up and carry off the surplus steam without condensation of the latter to any appreciable extent. Where cold or cool air is employed, moisture from condensation collects in the crevices of the air passages and
 50 conduits. The air-current bears with it also the dust from the grain falling into the steaming conduit.

By the construction described, the temperature of the air-currents may be regulated and
 55 two conduits may be operated from one fan. More than two conduits 2 might, of course, be mounted in the same frame and connected with a single exhaust fan, if the latter have capacity sufficient.

60 Having thus described my invention, I claim—

1. A grain-steaming apparatus having the upper end of its steaming conduit connected by an air-conduit with means for exhausting
 65 the surplus steam, and connected also with a conduit for heated air, and provided with

means for heating the said air before it mingles with the steam to be carried away, substantially as and for the purposes set forth.

2. A grain-steaming apparatus having an
 70 upright steaming conduit, means for drawing air over the open top of said conduit for the removal of the surplus steam therefrom, and means for heating said air before it passes over the conduit.

3. A grain-steaming apparatus having an
 75 upright steaming conduit, an air-conduit extending over the open top of the steaming conduit and connected at one end with an air-exhauster, and means for heating the air on its
 80 way to the top of the steaming conduit.

4. In a grain-steaming apparatus, the combination with an upright steaming conduit 2, having an upwardly directed steam-jet nozzle in its lower part, a heating chamber 9, a steam
 85 coil in said chamber, an air-conduit 8, connected with the upper part of the steaming conduit 2, and with the chamber 9, an air-exhauster arranged to draw air through the conduit 8, and pipes for supplying steam to the
 90 said nozzle and coil, substantially as set forth.

5. In a grain-steaming apparatus, the combination with the upright steaming conduit 2, of the chamber 9, adjacent to the upper part of said conduit, said chamber having an air-
 95 inlet 11, at its lower part and communicating at its upper part with an air-conduit 8, the said air-conduit, communicating with the steaming conduit and with the suction side of an exhaust fan, and the said fan, substan-
 100 tially as set forth.

6. A grain-steaming apparatus having its steaming conduit connected with means for exhausting the surplus steam, and connected
 105 also with a conduit for heated gas, whereby the temperature of the steam is maintained above the condensation point until it is expelled from the apparatus by causing it to mix with the hot gas, as set forth.

7. In a grain-steaming apparatus, the combination of an upright steaming-conduit, a
 110 steam-pipe leading into the same, and a nozzle, comprising a base secured to said steam-pipe and having a central tubular portion which projects above the upper surface of the
 115 base and is provided with lateral outlets, said base being also provided with a raised marginal flange, and a hood mounted adjustably on the projecting central portion of the base, said hood having a diameter greater than that
 120 of the base, substantially as set forth.

8. The herein described method of maintaining the temperature of the surplus steam from a grain-steamer above the condensation point until it is expelled from the apparatus,
 125 which consists in mixing with said steam the heated gas while it is being drawn off, as set forth.

9. A jet-nozzle for steaming grain consisting of a circular base-piece having a central
 130 steam passage, and a conical hood, 20^f, mounted adjustably on said base-piece and larger

in diameter than the latter at its lower edge, whereby when in place, it extends laterally beyond the latter all around, as set forth. point of condensation, substantially as set forth. 10

10. The herein described method of preventing the condensation of steam in a grain-steamer, which consists in drawing off the surplus steam in connection with heated gas, whereby the gas, by mixing with the steam, keeps the temperature of the latter above the 5 In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HERBERT S. JEWELL.

Witnesses:

PETER A. ROSS,
HENRY CONNETT.