

(No Model.)

3 Sheets—Sheet 1.

F. B. GIESLER.
MALTING.

No. 507,580.

Patented Oct. 31, 1893.

Fig. 1.

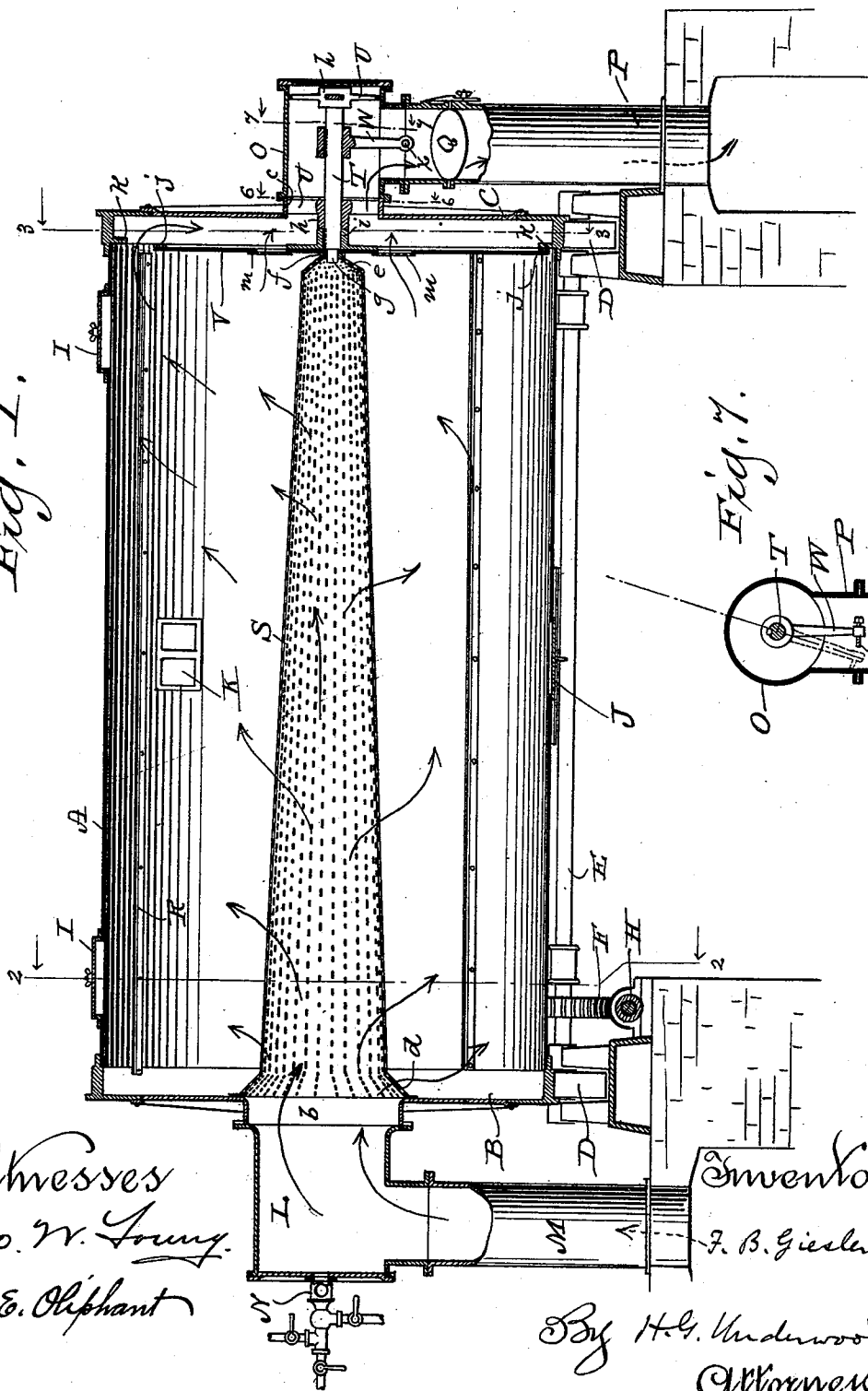
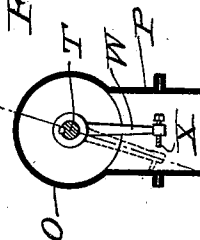


Fig. 7.



Witnesses
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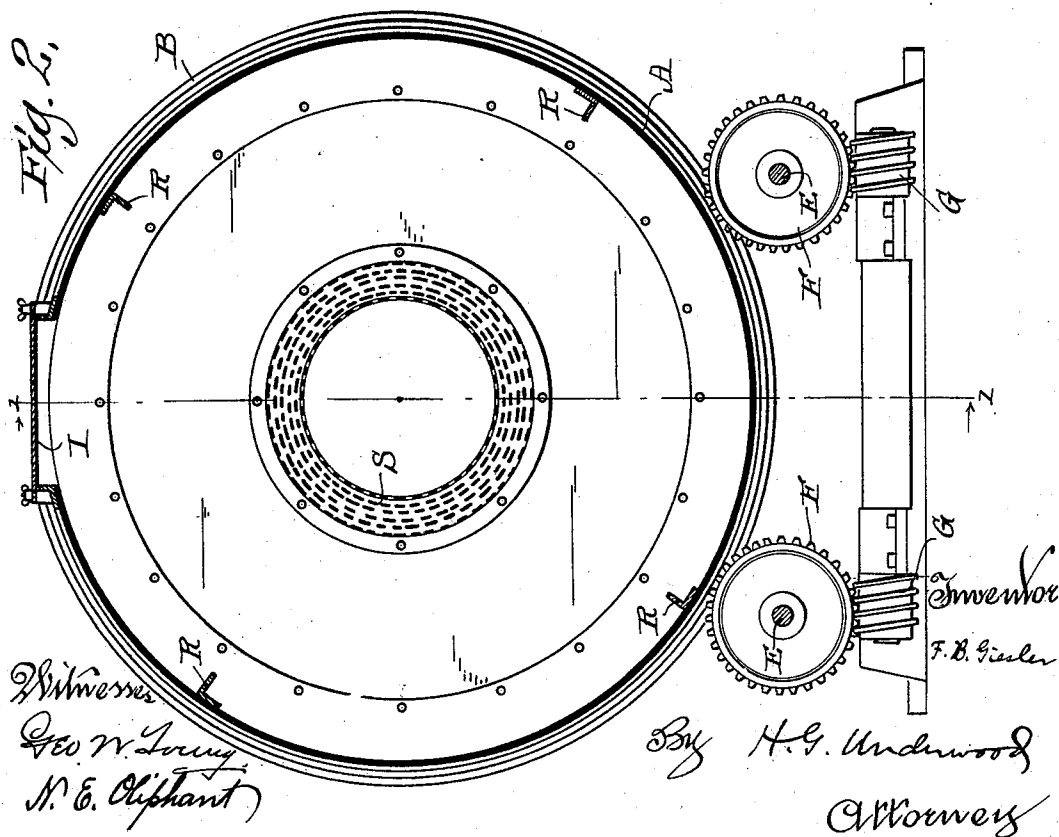
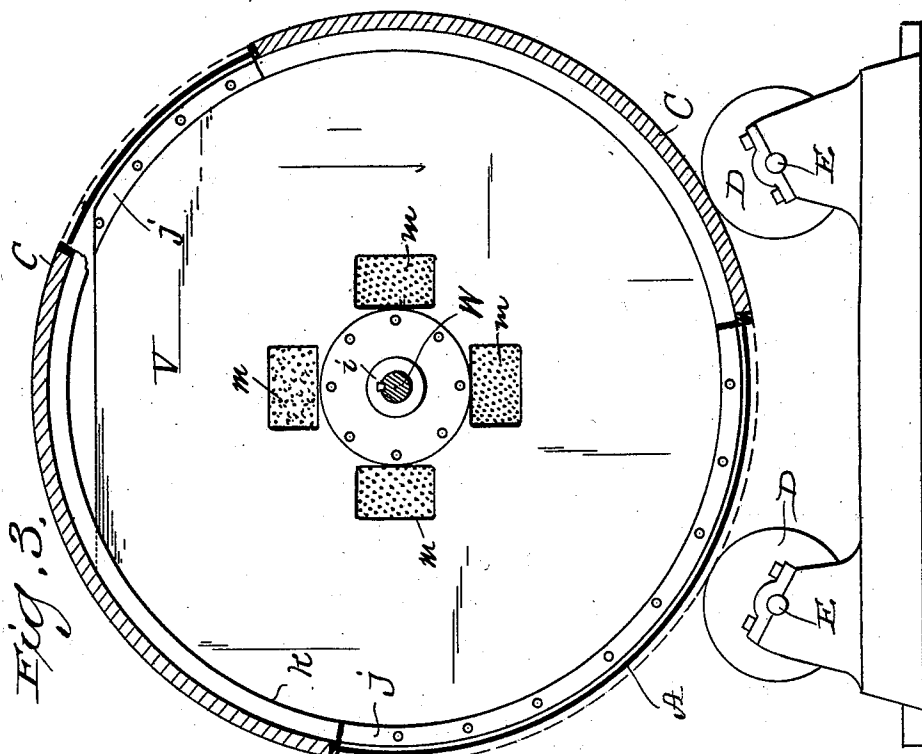
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Fig. 6.

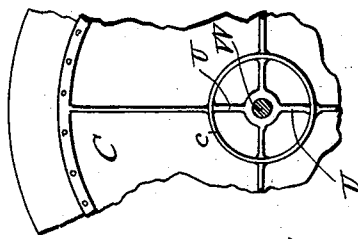


Fig. 5.

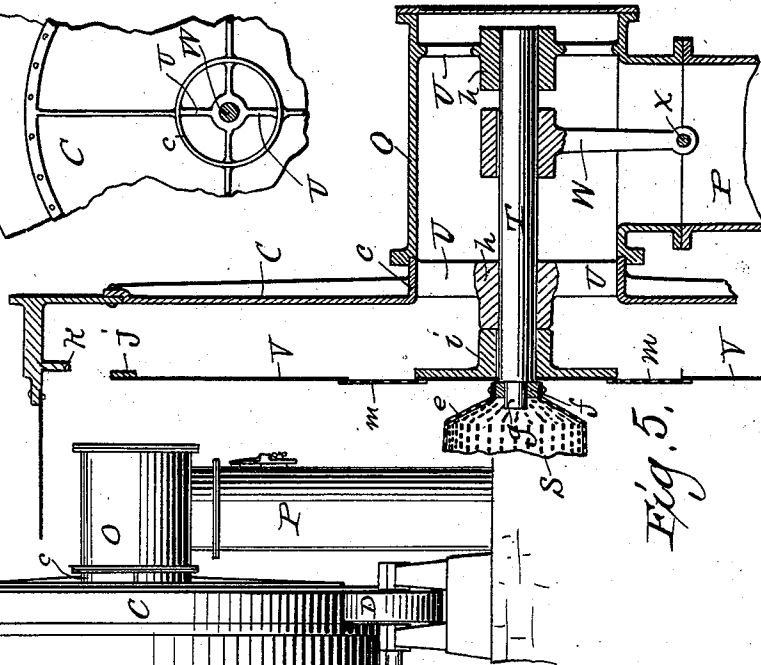
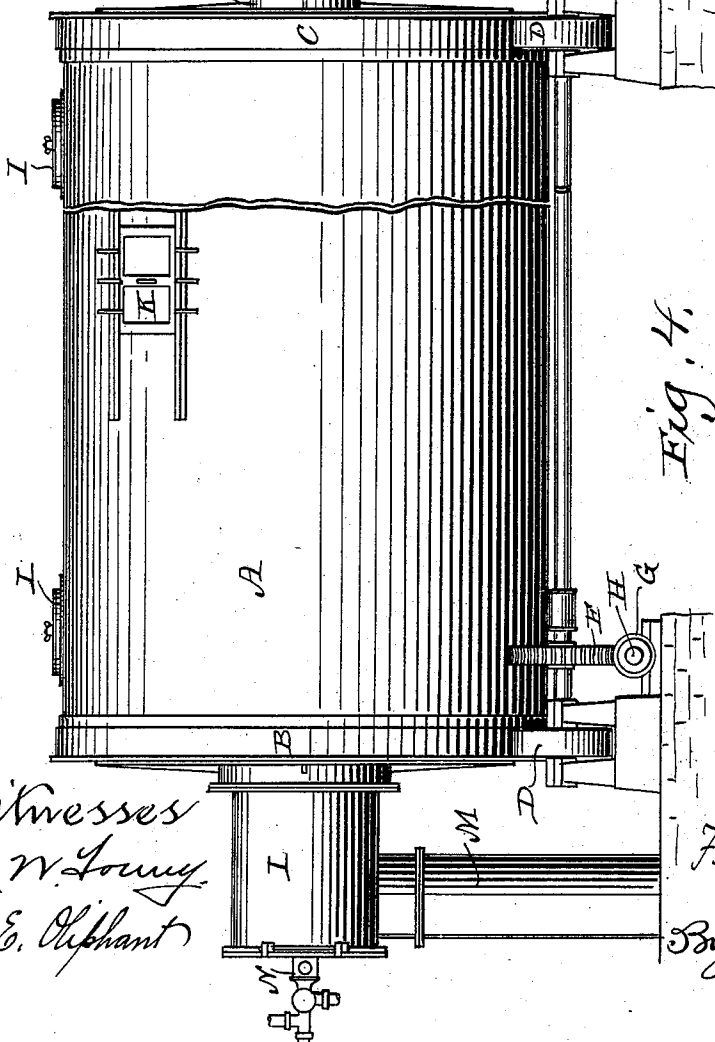


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANKLIN B. GIESLER, OF MILWAUKEE, WISCONSIN.

MALTING.

SPECIFICATION forming part of Letters Patent No. 507,580, dated October 31, 1893.

Application filed July 30, 1892. Serial No. 441,677. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN B. GIESLER, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Malting; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to simplify and cheapen malting apparatus of that class in which a rotative drum and means for circulating air therein are essential features; and the said invention consists in certain peculiarities of construction and combination of parts hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a vertical longitudinal section of a malting apparatus constructed according to my invention, the section being taken on line 1—1 of the succeeding figure; Figs. 2 and 3 vertical transverse sections respectively taken on line 2—2 and 3—3 of the preceding figure; Fig. 4, a side elevation of the malting apparatus; Fig. 5, a detail vertical longitudinal section of the exhaust end of said apparatus practically taken on line 1—1 of Fig. 2, but illustrating the parts on a larger scale than in Fig 1; Fig. 6, a detail end elevation partly in section on line 6—6 of Fig. 1, and Fig. 7, a detail sectional view on line 7—7 of the same figure.

Referring by letter to the drawings, A represents a drum having the peripheries of its heads B, C, impinged against friction disks D fast on longitudinal shafts E arranged in suitable bearings on opposite sides of the center of the drum and beneath the same. By means of worm-wheels F fast on the longitudinal shafts E, and in mesh with worms G rigid on a drive shaft H, a rotation is imparted to the drum, by the contact therewith of the friction-disks D that are also fast on said longitudinal shafts, this rotation being necessarily slow.

The drum is provided with the usual inlet openings for steeped grain, and suitable covers I are employed to close the openings when said drum is in operation. The drum is also provided with a central discharge opening having a sliding cover J, and a man-hole hav-

ing a similar cover K, these covers being held closed by any suitable means.

Each of the drum heads B, C, is provided with a central opening having an outwardly extended flange. The flange *b* on the drum head B turns freely in the open end of a chamber L joined to a vertical pipe M designed for connection with sources of cool moist air and hot-air employed at different stages of the malting process. As shown in Fig. 1, I prefer to connect an atomizer N to the closed end of the chamber L, this atomizer being of any preferred construction and put into operation at such times as may be necessary or desirable. The flange *c* on the drum-head C turns freely in the open end of another chamber O joined to a vertical pipe P that in practice leads to a duct or passage in communication with a suction fan, not shown, but common in the art to which my invention relates, the draft through said pipe being controlled by a damper Q shown in Fig. 1.

The construction and arrangement of parts thus far described except as to the inclusion of the atomizer N is not materially different in the matter of detail from what is shown and minutely specified in Patent No. 476,997, issued June 14, 1892, to F. B. Giesler and H. Smith, the novel features of the present apparatus being hereinafter set forth.

At intervals of its circumference, the drum A is interiorly provided with longitudinal ribs R, preferably in the form of angle irons bolted to said drum, these ribs being designed to insure a lifting and turning over of the grain during the rotation of the aforesaid drum.

Fast to the head B of the drum is the flaring end *d* of a centrally arranged conical pipe S of any suitable perforated material, the small ends *e* of this conical and perforated pipe being abruptly tapered and provided with a collar *f* that loosely engages the reduced inner end *g* of a shaft T that is loose in the bearings *h* forming part of spiders U, one of which is fitted in the flanged opening of the drum-head C and another in the exhaust-chamber O above specified.

Keyed or otherwise made fast to the shaft T is a hub *i* on a plate V that is provided with a facing *j* of brass or other anti-friction material that impinges against a circumferential

flange *k* extended inward from the drum-head C, the plate being in the form of a circle cut away on a horizontal line to leave an opening for the escape of air from the drum, the normal position of this plate being best illustrated in Fig. 3. Adjacent to its hub, the plate V is provided with a series of openings closed by perforated plates *m*, and to prevent the plate from having any greater movement on its axis than is necessary to bring its straight edge parallel with the fall of the grain in the drum, when under rotation, I key a stop-arm W on that portion of the shaft T within the exhaust chamber O and provide the free end of this stop-arm with a screw X at right angles thereto, the screw being adjusted to vary the throw of said arm as may be found necessary in order to accurately determine the parallel relation above specified.

In practice the pressure of the grain on the plate tends to cause a rotation of the latter and the shaft T on which it is keyed, but the screw X or free end of the stop-arm W coming in contact with the opposing pipe P the rotation of said plate is checked and the latter is maintained in such position as to have its straight edge parallel to the constant fall of said grain in the drum, whereby the air-outlet from said drum is also parallel to the air-space therein. Steeped grain being introduced into the drum and the rotating mechanism started, cool moist-air is admitted through the pipe M and chamber L to the conical perforated pipe S from whence it is drawn through said grain by the usual suction apparatus and passes out at the opening due to the cut away portion of the otherwise circular plate V, the suction being regulated by the damper Q, above described. The pipe S being conical with its greatest diameter farthest from the suction, the draft is equalized throughout the grain owing to the fact that there is necessarily a greater amount of this grain to be acted upon at the point nearest said suction, and by this equalization of the draft I insure an equal germination of the mass within the drum. The air acting on the grain immediately adjacent to the abruptly tapered small end of the perforated pipe exhausts through the adjacent perforations in the plate V, and thus none of said grain can possibly escape the germinating influence. The germinating process having been completed, the cool moist-air is cut off and hot-air turned on to dry the malt, the circulation of this hot-air being precisely the same as that described in connection with said cool moist-air.

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

1. The combination of a horizontal rotative drum having one end thereof communicating with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open to air at that end farthest from the exhaust, but of such construction as to have a gradual in-

crease of resistance to the escape of the air toward the point at which the suction is greatest; and suitable means for the provision of an air-space within said drum intermediate of said exhaust and adjacent end of the perforated pipe, this air-space being in communication with that portion of the aforesaid drum containing said pipe, substantially as set forth.

2. The combination of a horizontal rotative drum having one end thereof communicating with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open to air at the end farthest from the exhaust, but of such construction as to have a gradual increase of resistance to the escape of the air toward the point at which the suction is greatest; and a transverse partition arranged within said drum intermediate of said exhaust and the perforated pipe, but which only partially cuts off that portion of the aforesaid drum containing said pipe, substantially as set forth.

3. The combination of a horizontal rotative drum having one end thereof communicating with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open to air at the end farthest from the exhaust, but of such construction as to have a gradual increase of resistance to the escape of the air toward the point at which the suction is greatest; and a non-rotary plate arranged within said drum intermediate of the exhaust and adjacent end of the perforated pipe, this plate being of such dimensions as to leave an opening connecting the spaces on opposite sides thereof, substantially as set forth.

4. The combination of a horizontal rotative drum having one end thereof communicating with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open to air at that end farthest from the exhaust, but of such construction as to have a gradual increase of resistance to the escape of the air toward the point at which the suction is greatest; a transverse plate normally loose in the drum intermediate of the exhaust and adjacent end of the perforated pipe, this plate being of such dimensions as to leave an opening connecting the spaces on opposite sides thereof, a flange in frictional contact with the plate, and a stop-mechanism for limiting movement of said plate on its axis, substantially as set forth.

5. The combination of a horizontal rotative drum having one end thereof communicating with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open to air at that end farthest from the exhaust, but of such construction as to have a gradual resistance to the escape of the air toward the point at which suction is greatest; a loose shaft in line with the pipe and loosely engaging that end of the same nearest the exhaust, a transverse plate fast on the shaft and having such dimensions as to leave an opening connecting the spaces between which it

intervenes, a flange in frictional contact with the plate, and a stop-mechanism for limiting the movement of said plate on the shaft, substantially as set forth.

5 6. The combination of the rotative horizontal drum having a perforated longitudinal pipe of conical form arranged therein to rotate therewith, an air-circulating system of which the perforated pipe forms a part, a
10 transverse plate normally loose at the small end of said pipe and having the form of a circle cut away at a certain point of its circumference, a circular flange in frictional contact with the plate, and a stop-mechanism
15 for limiting movement of said plate on its axis, substantially as set forth.

7. The combination of the rotative horizontal drum having a perforated longitudinal pipe of conical form abruptly tapered at its
20 small end, an air-circulating system of which the perforated pipe forms a part, a transverse plate that is loose at the small end of said pipe, has the form of a circle cut away at a certain point of its circumference and is provided with perforations adjacent to said pipe;
25 a circular flange in frictional contact with said plate, and a stop-mechanism for limiting movement of said plate on its axis substantially as set forth.

30 8. The combination of a rotative horizontal drum having a perforated longitudinal pipe of conical form abruptly tapered at its small end, an air-circulating system of which the perforated pipe forms a part, a loose shaft in
35 line with said pipe and loosely engaging the same, a transverse plate that is fast on the shaft, has the form of a circle cut away at a certain point of its circumference and is provided with perforations adjacent to said pipe;
40 a circular flange in frictional contact with said plate, and a stop-arm fast on said shaft substantially as set forth.

9. The combination of a horizontal rotative drum having one end thereof communicating
45 with an air-exhaust, a perforated longitudinal pipe arranged within the drum and open at that end farthest from the exhaust, but of such construction as to have a gradual increase of resistance to the escape of the air
50 toward the point at which the suction is

greatest; an atomizer in line with the inlet end of the perforated pipe, and suitable means for the provision of an air-space within said drum intermediate of said exhaust and adjacent end of said perforated pipe, this air-
55 space being in communication with that portion of the aforesaid drum containing the aforesaid pipe, substantially as set forth.

10. The herein described malting apparatus consisting of the rotative horizontal drum interiorly provided with longitudinal ribs at intervals of its circumference, a perforated longitudinal pipe of conical form arranged within the drum to rotate therewith, an air
60 circulating system of which the perforated pipe forms a part, a transverse plate that is normally loose at the small end of the pipe, has the form of a circle cut away at a certain point of its circumference and is provided with perforations adjacent to said pipe; a circular
70 flange in frictional contact with the plate, and a stop-mechanism for limiting movement of said plate on its axis, substantially as set forth.

11. The herein described malting apparatus
75 consisting of the rotative horizontal drum interiorly provided with longitudinal ribs at intervals of its circumference, a perforated longitudinal pipe of conical form arranged within the drum to rotate therewith, an air circulating system of which the perforated pipe
80 forms a part, an atomizer in line with the inlet end of said pipe, a transverse plate that is normally loose at the small end of said pipe, has the form of a circle cut away at a certain
85 point of its circumference and is provided with perforations adjacent to said pipe; a circular flange in frictional contact with the plate, and a stop-mechanism for limiting movement of said plate on its axis, substan-
90 tially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANKLIN B. GIESLER.

Witnesses:

N. E. OLIPHANT,
H. H. MEIXSELL.