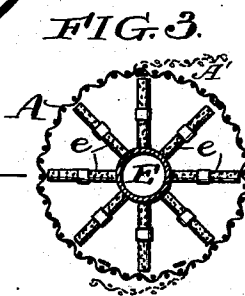
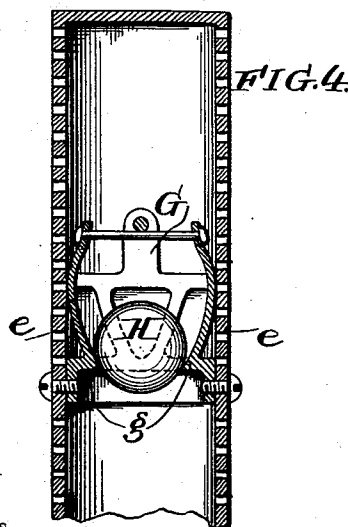
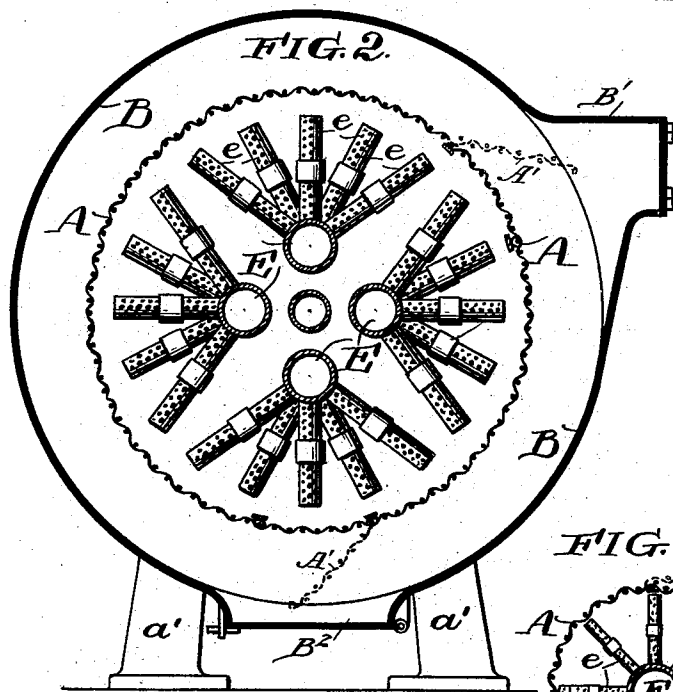
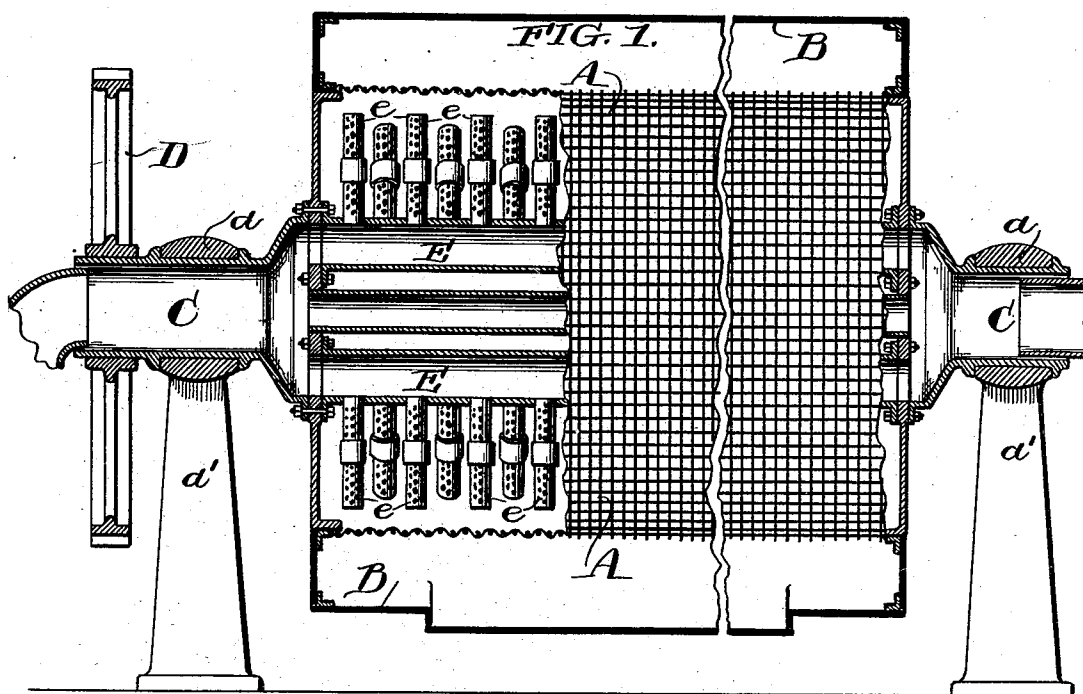


(No Model.)

J. J. DE KINDER & A. S. VOGT.
DRYING MACHINE.

No. 506,916.

Patented Oct. 17, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEPH J. DE KINDER, OF PHILADELPHIA, AND AXEL S. VOGT, OF ALTOONA,
PENNSYLVANIA.

DRYING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 506,916, dated October 17, 1893.

Application filed October 11, 1892, Serial No. 448,498. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH J. DE KINDER, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and
5 AXEL S. VOGT, a subject of the King of Sweden and Norway, and a resident of Altoona, county of Blair, State of Pennsylvania, have invented a new and useful Improvement in Drying-Machines, of which the following is a full, clear, and exact description, reference
10 being had to the accompanying drawings, which form a part of this specification.

Our invention has for its object the production of a machine in which various materials
15 may be treated and thoroughly dried, and it is especially adapted for the drying of what are known as brewers' grains, and our invention consists in certain arrangements and combination of mechanism whereby the heat
20 is evenly distributed to the material to be dried, and is prevented from passing into that portion of the receptacle unoccupied by the material to be dried.

In the drawings—Figure 1 is a longitudinal
25 section partially in elevation of our apparatus. Fig. 2 is a cross-section of drying cylinder. Fig. 3 is a cross-section of modified form of drying cylinder. Fig. 4 is a section of one of the pipes.

30 A is the receptacle for the material to be dried, which is preferably a perforated cylinder having door or removable portion A' B' B² being the doors in the outer cylinder for the insertion of the material surrounded by a
35 solid casing B.

C are the steam or other heat inlet pipes, which are secured to the receptacle A and rest in bearings *a* supported upon stands *a'*. The pipes C are adapted to be revolved, and
40 may be revolved by means of the wheel D secured to said pipe C through the cylinder A. Secured to the heads of said cylinder so as to revolve with it is a series of pipes E, which pipes open in the flared out portion of pipes
45 C. Projecting from the pipes E, preferably radially, are a number of perforated pipes *e*. These pipes *e* are shown in section in Fig. 4. In the upper portion of each of these pipes is a frame work or guide-way G, which is se-
50 cured together and to the pipe. The lower

portions of this guide-way approach each other so as to leave but a slight space *g*.

H is a ball or sphere the cross section of which at its greatest diameter is greater than the space *g*, so that said ball is adapted to, 55 and will, fill said space. The ball H is placed in said guide-way, and when the pipe assumes a vertical position, projecting above the conduit pipe to which it is connected, the ball H will roll down the guide way and fill the space 60 *g*, preventing any steam or hot air reaching the upper end of the pipe, and as the pipe passes gradually downward in the rotation of the receptacle A, the ball leaves said orifice and runs along the guide way, opening said 65 orifice and allowing the steam or hot air to pass through the entire length of the pipe. When the pipe is ascending the ball will move along the guide-way toward the orifice *g* and will close the same when the pipe is above its 70 corresponding conduit pipe, which is the position of the pipe when it is partially above the material to be dried.

The operation is as follows: The material to be dried is placed in the receptacle A and 75 the same rotated, steam or hot air being admitted as before described, and as the pipes rise above their conduits, as before described, the balls move down the ways and close the orifice or space *g*, and as they pass downward, 80 move away from said orifice, opening the orifice or space *g*, so that automatically the upper portion of the pipe is closed when it is in the upper portion of the receptacle and again automatically opened as it passes into 85 the lower portion of the cylinder. The position of these ways may be varied so as to cut off more or less of the pipe when the orifice is closed, according to the quantity of material in the receptacle. 90

If desired, in place of a series of steam conduits E, one central conduit E may be used, as shown in Fig. 3, from which the pipes *e* project, as shown in said figure. The steam may be admitted at one end of the cylinder only 95 if desired.

Having now fully described our invention, what we claim, and desire to protect by Letters Patent, is—

1. In a drying machine, in combination 100

with a receptacle adapted to rotate, pipes adapted to receive and distribute a heating medium and at an angle to the axis of rotation of said receptacle and a spherical valve and seat in each pipe.

5 2. In a drying machine, the combination with a receptacle adapted to rotate, of a conduit passing through said receptacle and adapted to a heating medium and rotate with
10 said receptacle distributing pipes opening into said conduit and projecting from said conduit at an angle to the axis of rotation, and a spherical valve and seat in each distributing pipe.

15 3. In a drying machine, in combination

with a receptacle adapted to rotate, a series of conduits passing through said receptacle, distributing pipes for a heating medium opening into each of said conduits and projecting therefrom at an angle to their axis of rotation, and a spherical valve and seat in each distributing pipe. 20

In testimony of which invention we have hereunto set our hands.

JOSEPH J. DE KINDER.
AXEL S. VOGT.

Witnesses:

CHARLES W. KEPHART,
EDWARD F. REIGH.