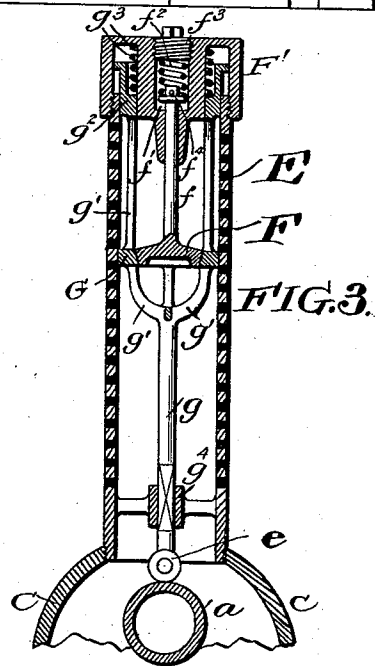
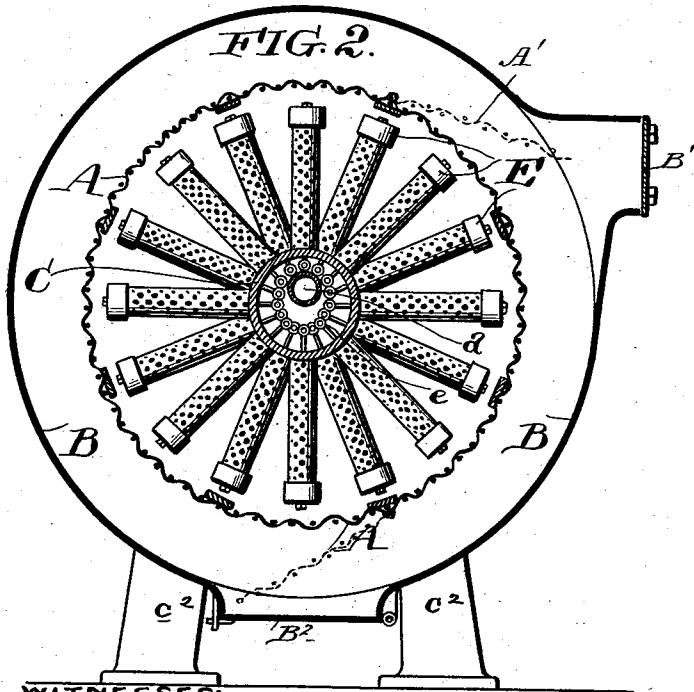
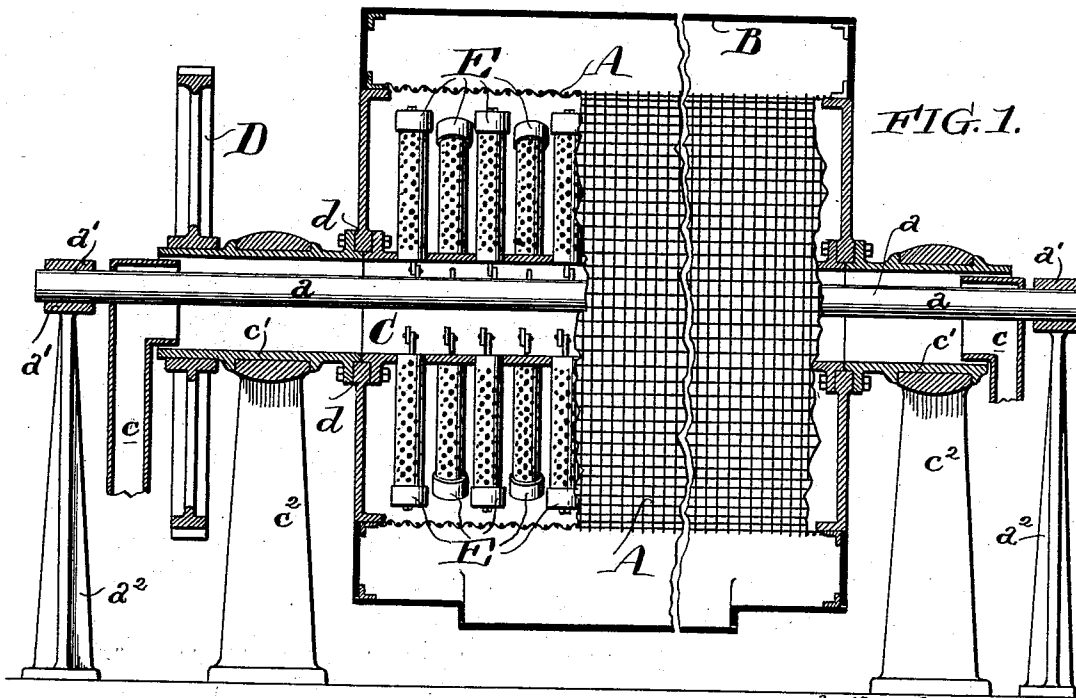


(No Model.)

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

No. 506,915.

Patented Oct. 17, 1893.



WITNESSES:

Henry Drury
Frank S. Bresser

INVENTORS:

Joseph J. de Kinder
Abel S. Vogt
By the undersigned
J. H. Harding

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. 506,915, dated October 17, 1893.

Application filed October 11, 1892. Serial No. 448,497. (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 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 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 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 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 section, partly in elevation, of my apparatus. Fig. 2 is a cross-section of drying cylinder. Fig. 3 is a section of one of the pipes.

A is a perforated cylinder having door or removable portion A' for the insertion of the material surrounded by a cylinder B, said cylinder B being provided with charging door B' and discharging door B². Passing through the cylinder A is a pipe or conduit C, having at its end connection with pipes c which lead from the source of heat supply. The pipe C is supported on bearings c', supported upon standards c².

D is a wheel secured to the pipe C, and when power is applied to it the pipe C is revolved. The pipe C is also connected to cylinders A and B at the points d d, so that when the pipe C is revolved the cylinder revolves with it. Projecting from said pipe C are a number of perforated pipes E. Within each of said pipes E is a valve F, having a valve stem f. This valve stem projects upward into the recess f' in the cap F', which is screwed or otherwise secured to the upper end of the pipes E. A spring f² surrounds the upper portion of the valve stem f, and the spring is confined between the plug f³ and collar f⁴,

the orifice f' being such as to limit the movement of the valve stem by the collar striking the bottom portion of said orifice.

G is the valve seat, and g a rod having the bifurcated end g', which is secured to and passes through the valve seat. The bifurcated portions, g', g', in the upper portion are secured to an annular ring g², against which rests a spring or springs g³, confined between the cap F' and the annular ring g². The lower portion g of this rod connected to the valve seat, passes through the guide g⁴, and has at its end the roller e. This roller, e, rests against a shaft, a, which shaft is set eccentrically to the pipe C, and in such position that the roller e, in the rotation of pipe C and pipes E, strikes the shaft a (see Fig. 2), which forces up the valve and valve seat against the springs, bringing the valve seat and valve together and closing the upper portion of the pipe. As may readily be seen, this occurs when the pipes E are in the position projecting above the pipe C (projecting into the upper portion of the receptacle). When the roller, e, passes beyond the shaft, a, the springs g³ force the valve seat downward, and the spring f² forces the valve downward; but the collar f⁴ limits the movement of the valve in its downward path and prevents it descending as far as the valve seat does, which leaves an orifice between the valve and valve seat through which the heating medium may pass. A door or any desired opening may be made in the cylinders A and B for the purpose of introducing the material to be dried.

The operation is as follows: The material to be dried is placed in the receptacle A and the pipe C rotated, and steam or heating agent admitted through the pipe c into the pipe C. The pipe C and receptacle A revolve, the pipes E rise into the upper portion of cylinder A, the roller e strikes the fixed shaft a and forces the valve seat up against the valve, closing the upper portion of the pipe, and, as the pipes descend, the rollers e pass beyond the shaft a, and the springs g³ force the valve seat downward, and the spring f² forces the valve downward, but, as before described, the travel of the valve being limited, the valve seat descends so as to be out of contact with

the valve, and the heating agent can pass into the upper portion of the cylinder.

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

1. In a drying apparatus, the combination of a receptacle adapted to rotate and to receive the material to be dried, a pipe C adapted to convey the drying agent and to revolve with the said receptacle, passing through said receptacle, pipes E projecting from the last mentioned pipe C within said receptacle, a valve and valve seat in each of said pipes E, a rod connected to the valve seat projecting into the pipe C, passing through the receptacle, and means substantially as described to operate said rod when its corresponding pipe passes above the pipe passing through the receptacle.
2. In a drying apparatus, the combination of a receptacle adapted to rotate and to receive the material to be dried, a pipe C adapted to convey the drying agent and to revolve with said receptacle passing through said receptacle, pipes E projecting from said last mentioned pipe within said receptacle, a valve and valve seat in each of said pipes E, a rod connected to the valve seat, said rod projecting into the pipe C passing through the receptacle, and a fixed shaft extending through said pipes, passing through said receptacle, and set eccentrically to said pipe C.
3. In a drying apparatus, the combination of a receptacle adapted to rotate and to receive the material to be dried, a pipe C adapted to convey the drying agent and to revolve with the said receptacle, passing through said receptacle, pipes E projecting from the last

mentioned pipe C within said receptacle, a valve and valve seat in each of said pipes E, a rod connected to the valve seat projecting into the pipe C, passing through the receptacle, a spring seat for the upper end of said rod, a valve stem connected to the valve, and a spring seat for the upper end of said valve stem, the construction being such as to limit the movement of said valve stem, and means substantially as described to operate the rod connected to the valve seat when its corresponding pipe passes above the pipe passing through the receptacle.

4. In a drying apparatus, the combination of a receptacle adapted to rotate and to receive the material to be dried, a pipe C adapted to convey the drying agent and to revolve with said receptacle, passing through said receptacle, pipes E projecting from said last mentioned pipe within said receptacle, a valve and valve seat in each of said pipes E, a rod connected to the valve seat, said rod projecting into the pipe C passing through the receptacle, and a fixed shaft extending through said pipes passing through said receptacle and set eccentrically to said pipe C, a spring seat for the upper end of said rod, a valve stem connected to the valve, and a spring seat for the upper end of said valve stem, the construction being such as to limit the movement of said valve stem.

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

JOSEPH J. DE KINDER.
AXEL S. VOGT.

Witnesses:

CHARLES W. KEPHART,
EDWARD F. REIGH.