

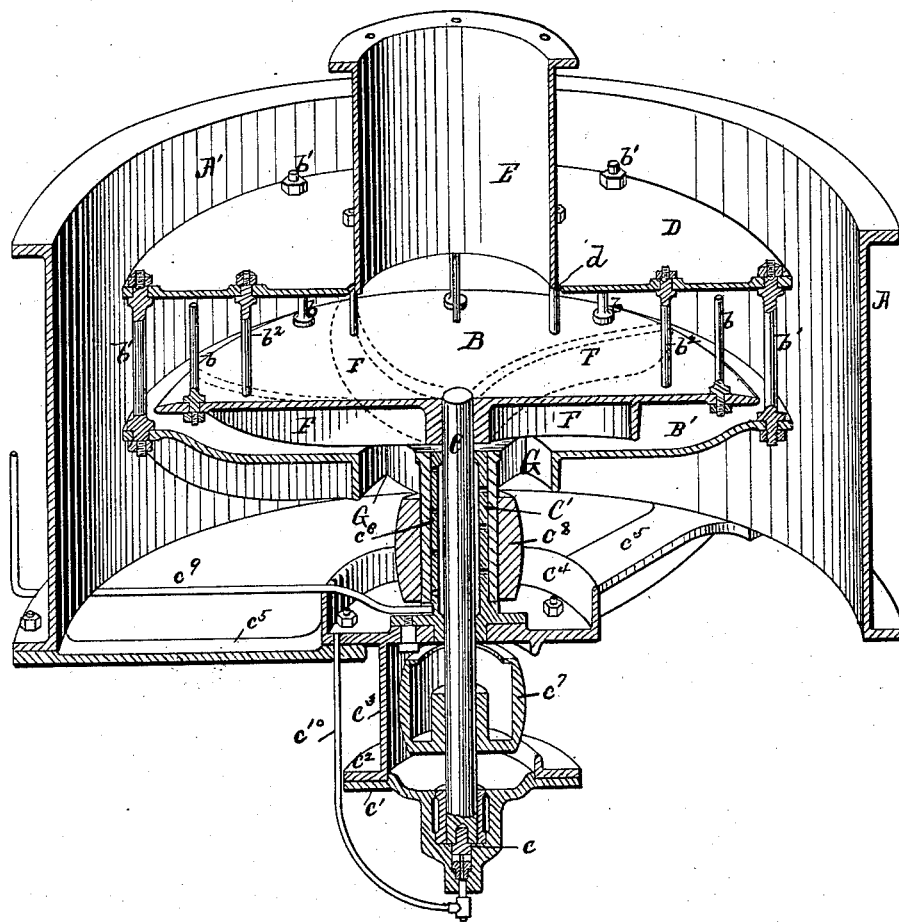
(No Model.)

G. ENGEL.

SUGAR MIXING AND COOLING APPARATUS.

No. 302,387.

Patented July 22, 1884.



Witnesses:
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UNITED STATES PATENT OFFICE.

GOTTFRIED ENGEL, OF BROOKLYN, NEW YORK.

SUGAR MIXING AND COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 302,387, dated July 22, 1884.

Application filed January 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, GOTTFRIED ENGEL, of Brooklyn, county of Kings, State of New York, and a citizen of the United States, have invented a Sugar Mixing and Cooling Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to a machine or apparatus for disintegrating and blowing air upon the particles of substances, and more particularly for use in breaking or mixing and cooling sugars; and my invention consists in the parts and devices and their combinations in the apparatus hereinafter described, and as set forth and more particularly recited in the claims.

In the drawing there is represented a vertical central sectional view in perspective of an apparatus embodying my invention.

A is a cylinder, which is intended to be bolted by its upper flange to the ceiling of a room—say in a sugar-house. This cylinder is open at its bottom, and is closed at the top by the ceiling, as stated. The cylinder thus constitutes a chamber, A'.

B is a disk mounted to revolve in its horizontal plane on the end of the shaft C. Said disk B carries the pins *b*, which are placed near the periphery of the disk, and are perpendicular to the plane of the disk, as shown.

B' is a second disk, arranged horizontally within said chamber, below the disk B, and mounted, as shown, to revolve on a journal or bearing, C'. This disk B' is of somewhat greater diameter than the disk B, as shown, and upon its rim has the perpendicular or upright pins or posts *b'*, which support and carry the frame or disk D above the disk B, from which frame or disk D depend the pins *b²*, arranged within the line of the pins *b* of the disk B. The frame or disk D has a central opening, *d*, through which enters the lower end of a hopper or spout, E, which it is intended shall pass upward through the ceiling, to which the cylinder A is secured, so that the material to be broken and cooled—such as sugar—may be thrown into the spout from the floor above.

Upon the under face of the disk B are cast or fixed the curved radial ribs or blower-arms F, as shown, and the disk B' has the openings

G transversely through it around its hub or bearing, as shown.

The shaft C is mounted vertically in a step at *c*, and the flange *c'* of this step-piece is secured to the flange *c²* of a hanger, *c³*, depending from the wide cup *c⁴*. This cup is supported by the arms *c⁵*, reaching from the lower rim of the cylinder A, and it in turn supports the upright journal or bearing *c⁶*, arranged around the shaft C, and on which the lower disk is mounted. A pulley, *c⁷*, drives the shaft C, being keyed to same below the cup *c⁴*, and a pulley, *c⁸*, drives the disk B', being keyed to the hollow shaft of the same, running on the bearing *c⁶*. A pipe, *c⁹*, serves the bearing *c⁶* with oil, said pipe extending from outside the cylinder A to said bearing. The overflow of oil from bearing *c⁶* passes into the cup *c⁴*, and thence through a pipe, *c¹⁰*, leading therefrom to the step *c*, where said overflow is used to lubricate the shaft C in said step.

It is evident that the material to be broken and cooled—such as sugar—as it comes from the centrifugal machines in sugar-houses will, on being thrown into the hopper E, fall upon the disk B, and that said disk being rapidly revolved in one direction, while the disk B' being rapidly revolved in the opposite direction, as is obvious may be done by means of the operating mechanism described, the sugar will be carried or thrown to the circumference of the disk B, and on its way will be caught and broken up by the oppositely-moving sets of pins *b*, *b'*, and *b²*, and will thence be thrown off the periphery of the disk B and will fall downward across the opening or space between the circumferences of the adjacent disks B and B'; and, furthermore, it is evident that the blower arms or blades F, carried by disk B, will draw air up through the openings G and force the same out through the space or opening between the rims of the disks B and B' and blow the air across and into the falling sugar. By this means the sugar will be broken or disintegrated and cooled.

The bearings and devices for lubricating the bearings of the shafts carrying the disks, &c., being wholly below the disks, it is obvious that they are most conveniently arranged for the operation of the machine without interfering with or damaging the sugar. The cooled and

disintegrated sugar falls downward through the open bottom of the cylinder A to the floor of the room, and may then be placed in barrels or suitable packages.

5 The pins carried by the disks may obviously be made in any desired form, and may be set at any desired angle to the face of the disk in which they are respectively mounted, and it is also obvious that the pins described may, in
10 place of being set in the face of the disk, be fixed in radial arms carried upon the periphery of the disk. It is furthermore evident that the blower-arms F may be carried by the lower disk, B', being fixed upon the upper face
15 of the said disk B', or may be independently mounted upon the shaft C, so as to move in the same direction as one of the disks, without departing from the nature of this feature of my invention, which is to cause a current of air to
20 be drawn in between the disks at the center thereof and forced out between their perimeters to the falling sugar, as described.

I find it desirable to employ the cylinder A, as described; but in some instances the inclosing-chamber may be much larger relatively to
25 the diameter of the disks than is shown in the drawing, and the sugar be then allowed to fall directly from the rims of the disks without striking the chamber-wall.

30 I am aware that a patent was issued to M. C. Cogswell on the 15th day of January, 1884, numbered 292,100, for a purpose similar to the one herein described and claimed. I disclaim all that is set forth in said patent.

35 What I claim as my invention, and desire to secure by Letters Patent, is—

1. In the described mixing and cooling apparatus, the combination, in a chamber, A', of the connected horizontal revolving disks B'

and D, the latter provided with a central horizontal opening, the oppositely-revolving disk B, between the disks B' and D, and a feed-hopper, E, leading into the central opening in D onto the disk B, as and for the purpose described. 40

2. In the described mixing and cooling apparatus, the combination, in a chamber, A', of the connected horizontal revolving disks B' and D, the latter supported upon and carried by the former and carrying a series of pins, b', the oppositely-revolving horizontal disk B, between the disks B' and D, and carrying a series of pins, b, and a hopper leading into a central opening in the disk, B', as and for the purpose described. 45 50 55

3. In the described mixing and cooling apparatus, the combination, in a chamber A', of the connected horizontal revolving disks B' and D, both provided with central openings, and a hopper, E, leading into said opening in B', together with the oppositely-revolving disk B, provided with the blower-arms F, as and for the purpose described. 60

4. In a mixing and cooling apparatus, the combination, with the horizontal oppositely revolvable disks B and B', working in chamber A', of the vertical shaft C, extending below said disks, and the arms c', cup c', hanger c', and step c, constituting support and bearing for said shaft, together with bearing c'', mounted on c' around said shaft and constituting bearing for hub C', all as and for the purpose set forth. 65 70

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Witnesses:

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