

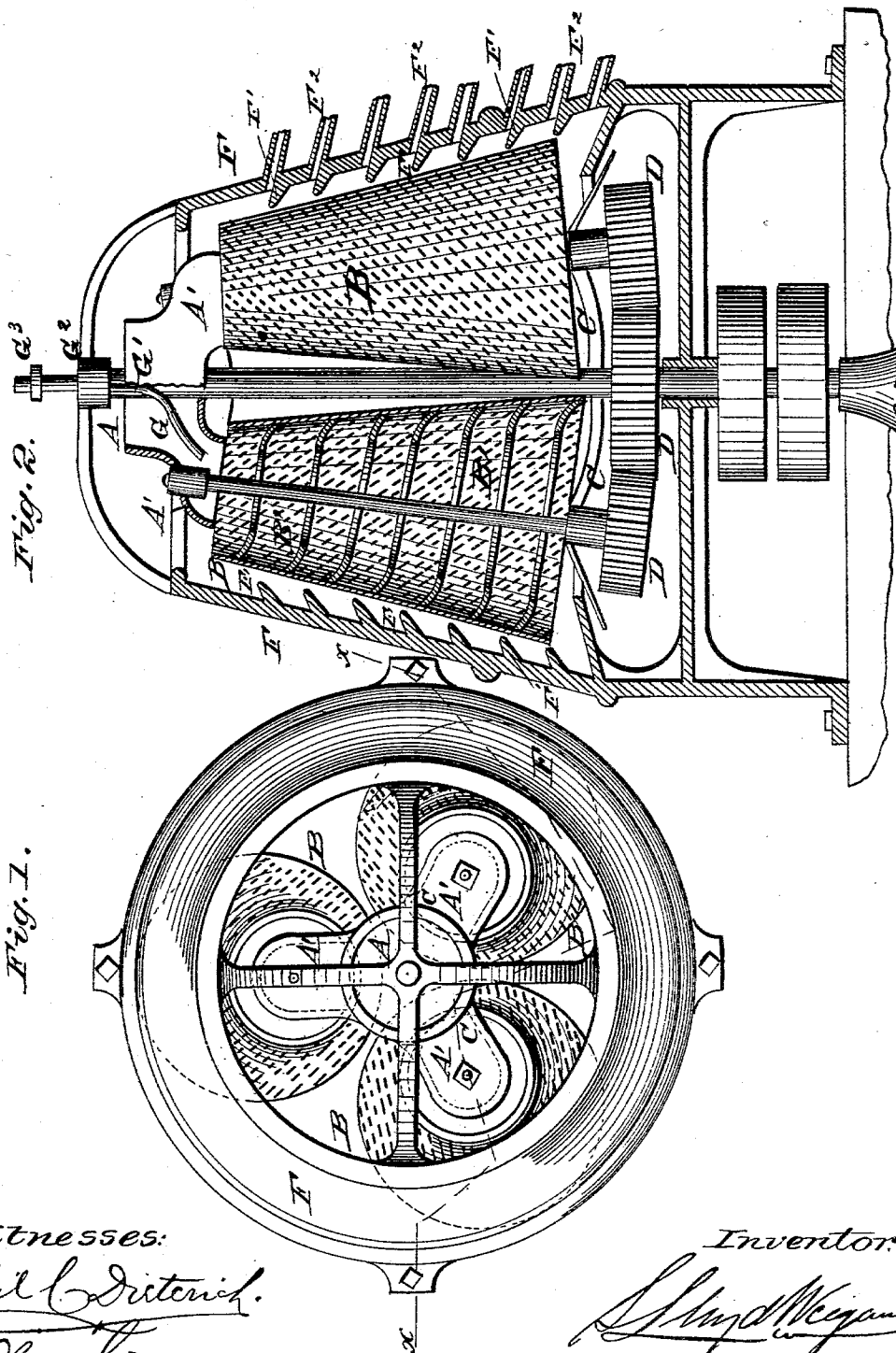
(No Model.)

2 Sheets—Sheet 1.

S. L. WIEGAND.
CENTRIFUGAL DRAINER.

No. 300,545.

Patented June 17, 1884.



Witnesses:
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Inventor:
S. L. Wiegand

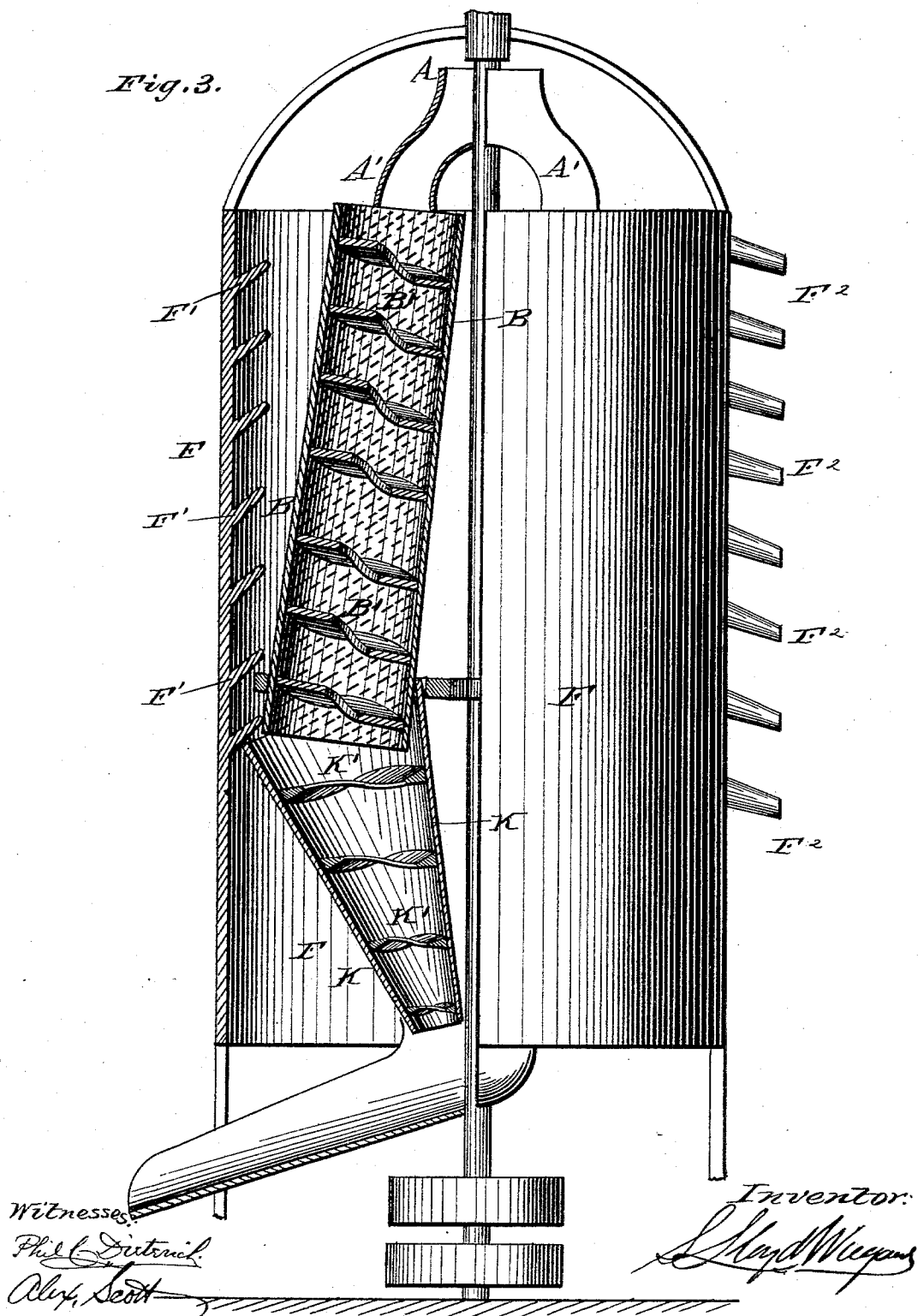
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UNITED STATES PATENT OFFICE.

S. LLOYD WIEGAND, OF PHILADELPHIA, PENNSYLVANIA.

CENTRIFUGAL DRAINER.

SPECIFICATION forming part of Letters Patent No. 300,545, dated June 17, 1884.

Application filed October 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, S. LLOYD WIEGAND, of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Centrifugal Drainers; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable others skilled in the art to make and use the said invention.

This invention relates to that class of centrifugal machines in which sugars containing water and sirup, and salt containing brine, are drained, and has for its object the saving of time and motive power incident to introducing the charge and developing the velocity to work effectively, and in retarding and stopping such machines and removing the charge, and the extracting and separating of liquids of different degrees of viscosity.

The nature of this invention consists in a series of revolving perforated vessels, each having a spiral blade or screw within and turning with it, the series of vessels being placed around a common axis, around which they revolve rapidly. A case surrounds the entire series of rotating vessels, and is provided with a series of shelves and spouts adapted to receive and deliver separately the fluid discharged in different parts of the vessels during the descent of the charge. The perforated revolving vessels are arranged under a pipe or branched tube, from which a continuous supply of the commodity in wet state can be introduced, and each turning slowly upon its axis, besides rotating rapidly around the common axis by the centrifugal force, pressing the charge between spiral blades or screws, against the sides of the vessel farthest from the axis of rotation. The rotation of the vessels and screws causes the charge to descend in them, and by placing or forming the vessels so that the receiving ends are nearer the common center or axis of rapid rotation than the discharging ends of the vessels the fluids most readily disengaged are discharged upon the upper shelves, while those less easily disengaged are discharged upon the shelves below, and the solid or dry portion of the charge, upon reaching the lower ends of the vessels, is thrown out without stopping the motion of the machine. Pipes by which fluids—such as steam or water or other displacing or washing

fluids—may be combined with the revolving vessels, so as to wash or cleanse the charge in its transit through the machine.

I will now proceed to particularly describe the mode of making and using this invention, referring in so doing to the drawings annexed, and the letters of reference marked thereon.

Figure 1 shows a plan of this machine; Fig. 2, a side elevation, partially in section, on the dotted line *y* in Fig. 1; and Fig. 3, a vertical partial section of a modified form of the invention.

The same letters of reference apply to the same parts in the several figures.

A represents a hopper for receiving the charge, and having branches A'. Under each of the branches A' is a circular perforated vessel or tube, B. These vessels may be made cylindric, as shown in Figs. 1, 2, and 3, or conical, as shown in Fig. 4. Fastened in each perforated vessel B is a screw-thread or spiral blade, B', extending from near the top to the bottom. The vessels B are secured to a frame, C, in which they each rotate on their own axes, being turned by gearing D. The funnel or hopper A, with its branches A', and the frame C, with the vessels B and gearing D, turn rapidly upon a central axis, power being applied by belting or other usual mode. A case, F, surrounds the rotating portion of the machine just described, and is provided with shelves F', inclined outwardly, and having spouts F², from which fluid lodging on the shelves F' may be drawn off. Tubes G and G', provided with stuffing-boxes, (marked G² and G³,) and having perforations in them near the lower ends, lead steam and water to the interior of the vessels B, and the steam and water delivered into the vessels B serve to cleanse the charge in its passage through them. The gearing D is preferably made to rotate with a variable or adjustable velocity. The rate at which the vessels B and screw B' turn determines the length of time during which the charge is exposed to centrifugal action.

The operation of the machine is as follows: The frame C and connected parts are put in rotation rapidly, and the vessels B are slowly rotated on their axes. A supply of granulated sugar and sirup poured in at the hopper A descends in the vessels B, being carried down-

ward by the screws B', and prevented from rotating with the vessel B about its axis by the centrifugal force resulting from its high velocity, compelling it to move in circles of the greatest radius. The centrifugal force being least at the upper part of the vessels B which are nearest their center of rapid rotation, the thinner fluids are then discharged, and becoming greater as it passes down to parts having higher velocities, the thick and more viscid fluids are expelled, and as the mass proceeds farther, when water or steam is admitted by the pipes G or G', the crystals or grains are washed in the washing-fluid, and such matter as is thereby dissolved is collected upon one of the shelves F' and drawn off. When the granulated or dried matter reaches the lower end, it is discharged. The solid or dry matter may be returned near to the center of rotation of the series of vessels by combining a series of conical vessels provided with screw-threads internally, and slowly rotated in the same manner as the vessels B, as is shown in the dotted portion of Fig. 4.

25 This machine can be run continuously, and the different qualities or consistencies of sirup may be separated by the several shelves, thus effecting a saving of the time ordinarily required to start and stop and fill and empty such machines, and avoiding the waste of power lost each time a centrifugal machine is stopped.

Having described my invention and the mode of using the same, what I claim is—

1. In a machine for separating or draining fluids from solids by centrifugal force, the combination of a series of rotating vessels having screws therein and rotating with them, adapt-

ed to progressively move the charge from the entrance to the exit, in combination with mechanism holding said charge from rotation with the screw by centrifugal effect, substantially as set forth.

2. The combination of a series of perforated revolving vessels having screws formed within, and arranged to slowly rotate therewith, so placed in relation to a common axis of rotation at high velocity as to rotate the charge through arcs of increasing radius during its progress through the machine.

3. The combination of draining-vessels, each having screws rotating therewith slowly upon their own axes, with a gearing adapted to produce such slow rotation, in conjunction with a frame and driving-gearing adapted to rotate the series of vessels with a high velocity, substantially as set forth and shown.

4. In combination with a series of vessels having internal screws adapted to progressively move the charge of matter through such vessels into a case or curb, shelves adapted to collect and separate fluids expelled at different points in the progressive motion of the charge, substantially as and for the purposes set forth.

5. In combination with a series of draining-vessels arranged to rotate about a common center at high velocity, and to pass charges of matter slowly through them, the pipes G and G', for introducing washing or purging fluids, substantially as set forth.

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Witnesses:

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