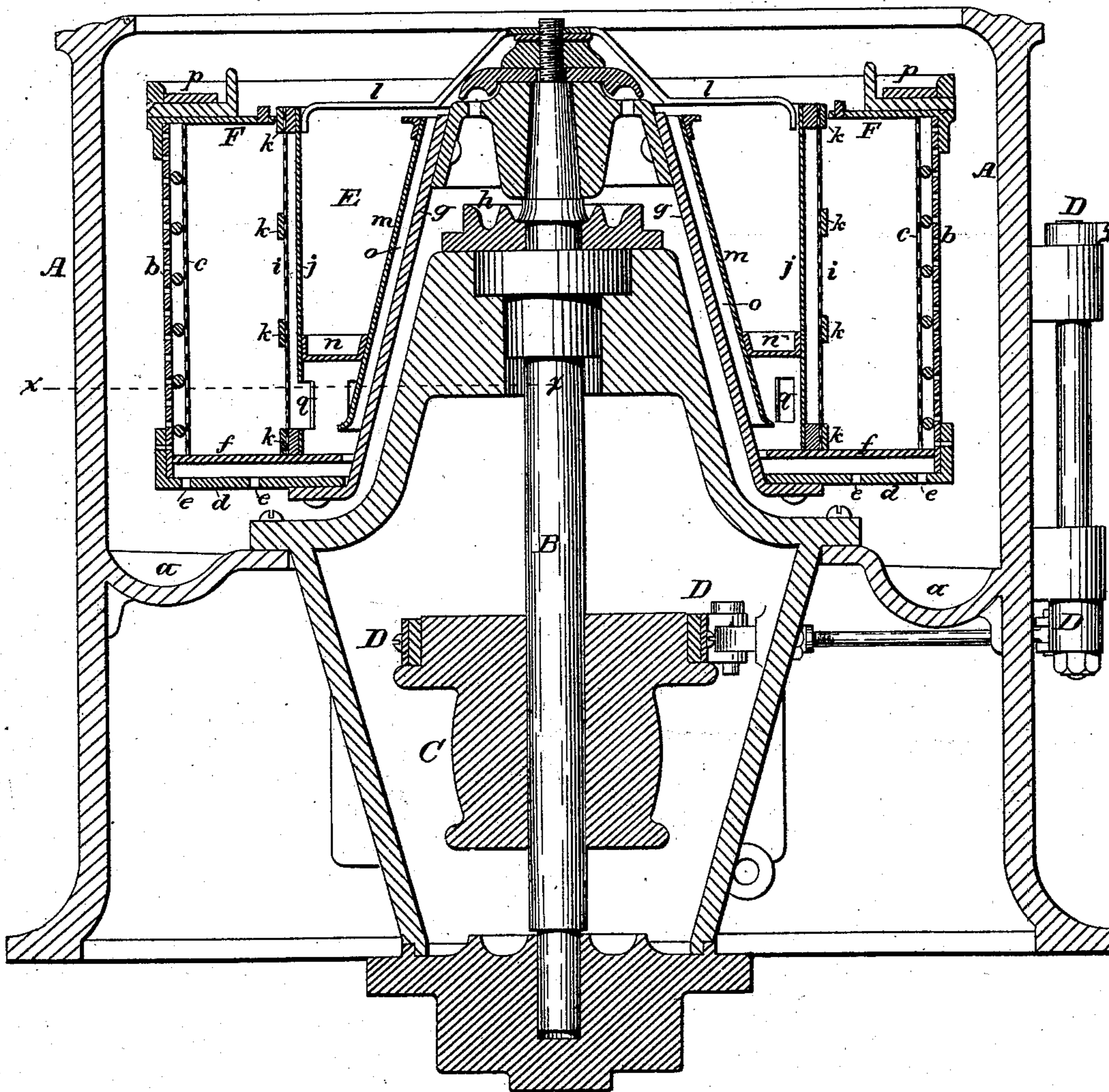


R. FRÉMAUX.
Centrifugal Sugar-Machine.

No. 224,674.

Patented Feb. 17, 1880.

Fig. 1.



INVENTOR:

WITNESSES:

H. Newell.

Thomas F. McDonald.

Raphaël Frémaux.

By his Attys

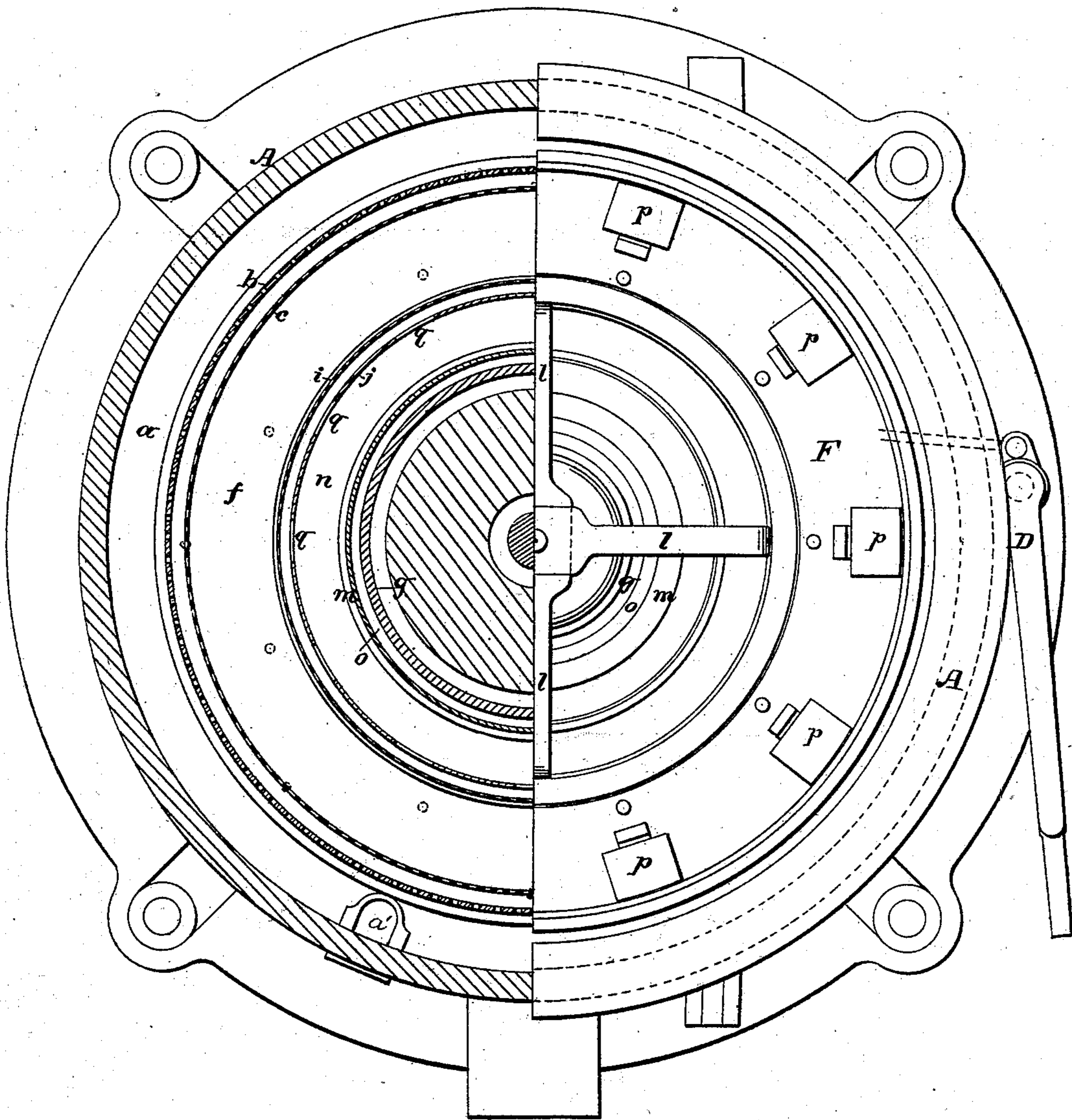
Burke Fraser Bonnett

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Fig. 2.



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Ch. Newell.
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UNITED STATES PATENT OFFICE.

RAPHAEL FRÉMAUX, OF PARIS, FRANCE.

CENTRIFUGAL SUGAR-MACHINE.

SPECIFICATION forming part of Letters Patent No. 224,674, dated February 17, 1880.

Application filed December 4, 1879.

To all whom it may concern:

Be it known that I, RAPHAEL FRÉMAUX, of Paris, France, have made certain Improvements in Centrifugal Sugar-Machines, of which the following is a specification.

My invention relates to improvements in centrifugal sugar-draining turbines or apparatus, the distinctive feature of which relates to the manner in which the drum performs the drainage previous to turbination or exposure to centrifugal action in the segments or forms. While claiming priority as regards the previous drainage in the forms, this same work may be performed in the drum without using any forms. The characteristic points which I claim, therefore, as my invention are the previous drainage before turbination centrifugal action, the peculiar construction of the steam-box, and the introduction of the steam from below in preparation in the mixer.

In the drawings which serve to illustrate my invention, Figure 1 is a vertical mid-section of a centrifugal apparatus or turbine provided with my improvements. Fig. 2 is a plan view of the same, the left side or half being in section on the horizontal line $x x$ in Fig. 1.

A is the outer shell, provided with a drain, a , having an outlet, a' . B is a vertical shaft, provided with suitable bearings, as shown, and arranged to be rotated by a belt on a pulley, C, keyed to the shaft. This pulley is provided with a suitable braking lever and belt, (represented generally by D.) On the shaft B is mounted the drum, which I will now describe. The outer wall is composed of a perforated metal sheet, b , and inside this is another or lining wall, c , of wire-gauze or finely-perforated metal, the two being slightly separated. The drum has a bottom, d , perforated with a few holes, e , and a false bottom, f , arranged above the bottom d . By its bottom this drum is secured to a sheet-metal cone, g , by which it is mounted on the shaft B. This cone forms a cap to protect the bearing-cap h , and is perforated to facilitate lubrication. Into the drum last described is fitted a cylinder, E, open at the top, and formed by an external shell, i , of wire-gauze, and an internal shell, j , of sheet metal. These are arranged to leave an annular steam-space between them, and they are riveted at both top

and bottom, and at various heights, to hoops k . This cylinder E is provided with cross-arms l , by which it is hung on the shaft B, and to two of these may be fixed handles, by which the cylinder can be lifted out. The cylinder E is provided with a sheet-metal cone, m , flared outwardly at the bottom, and connected with the shell j by an annular bottom plate, n . Between the cones m and g is an annular space, o , through which the water is drained off. The width of the annular space o between the cones may be regulated and divided and the cylinder centered by the employment of conical wedges, the same to be covered with sheet metal. By means of these I am enabled to place the cylinder in any position I may choose, according to the work to be performed, and these wedges may be made adjustable at pleasure.

The cover of the shell A, which is not represented in the drawings, is provided with an orifice for the admission of the steam, and on the inside a small cap which shuts off the water. The outer drum is constructed in the ordinary manner, generally, and to commence operations the inner cylinder, E, is let down into it by some suitable means and the sugar to be operated upon put into the annular space between the two drums. The annular cover F is then put on and fastened by means of the bolts $p p$, and the drum set in motion. As soon as the proper rotary velocity has been reached the cover of the shell A is put on and the steam admitted. As the steam enters at the top the water of condensation collects in the cylinder E, and, being acted upon by the centrifugal force, rises up along the wall j and is expelled. The steam drawn to the center by the rarefied air passes down into the bottom of the drum between the cones m and g . The water of condensation carried down or formed below strikes the bottom n , and is expelled through holes $q q$ in the wall j of the cylinder. The lighter steam traverses the outer gauze wall, i , passes into the annular sugar-chamber of the drum, and, rising through the sugar at the walls, operates to clarify the same. After the operation has been continued for a few minutes the rotation of the drum is stopped, the upper cover taken off, the annular cover F removed, and the cylinder E taken

out. The drum then presents its usual appearance.

The objects attained by my apparatus and method are these:

5 First, I admit the steam at the bottom, and thus avoid such contact with the sugar as would tend to harden the first layer too soon and before the entire mass could be purified.

Second, to avoid too great condensation the
10 steam-chamber is kept closed as far as possible.

Third, I take advantage of the action of gravity upon the water of condensation, so as to drain it off below.

Fourth, I arrange a chamber to catch the
15 water of condensation and employ centrifugal force to throw it off.

Having thus described my invention, I claim—

20 1. The inner cylinder, E, provided with the water-chamber formed by the sheets *j* and *m* and the bottom *n*, in combination with the outer drum having the cone *g*, the two cones *m* and *g* being arranged to leave an annular space between them, for the purposes set forth.

25 2. The inner cylinder, E, composed of the

gauze drum *i*, the imperforated drum *j*, the inner flared cone, *m*, the annular bottom *n*, and the arms *l*, the drum *j* being provided with openings *q q*, all substantially as and for the purposes set forth.

30 3. The outer drum, constructed of the perforated hoops or sheets *b c*, the ring-cover F, provided with fastening-bolts *p p*, the perforated bottom *d*, the false bottom *f*, and the internal cone *g*, all combined and arranged to
35 operate substantially as set forth.

4. The outer drum, with the false bottom *f*, perforated bottom *d*, and inner cone, *g*, with the inner cylinder, E, arranged to rest upon the bottom *f*, and provided with a shorter
40 flared inner cone, *m*, all substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

R. FRÉMAUX.

Witnesses:

ROBT. M. HOOPER,
A. CABY.