No. 648,073. Patented Apr. 24, 1900.

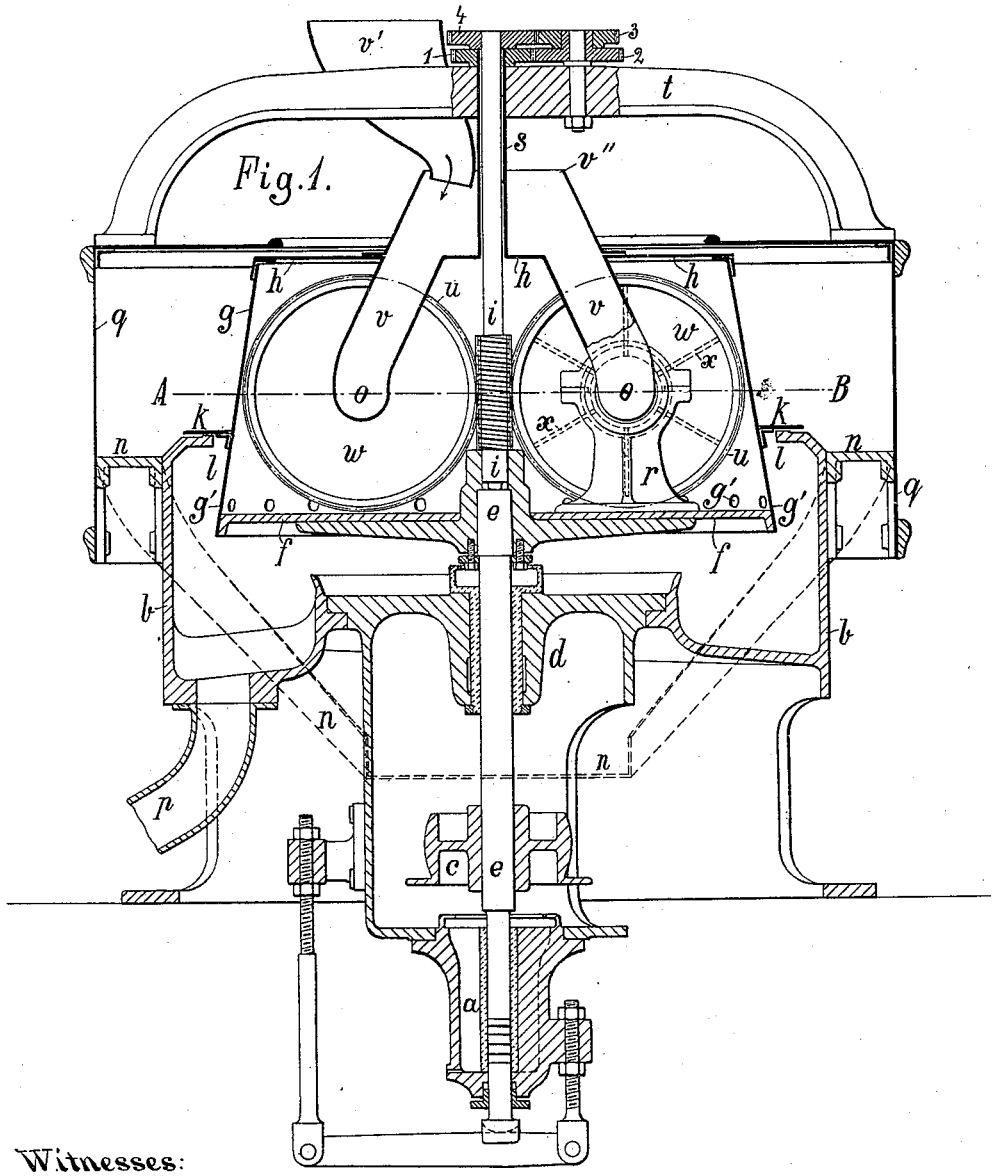
M. GÜTTNER.

CENTRIFUGAL MACHINE.

(Application filed July 12, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses:

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Att'y.

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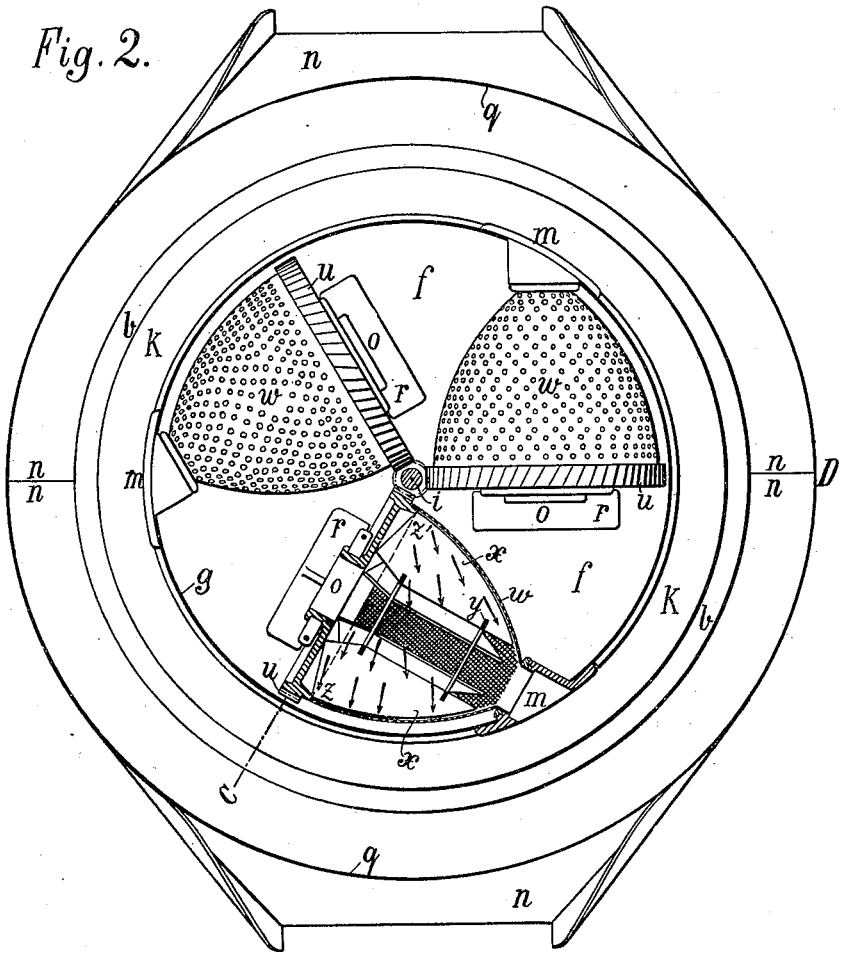
(No Model.) 2 Sheets—Sheet 2.

Fig. 2.



Witnesses:

Inventor;

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UNITED STATES PATENT OFFICE.

MAX GÜTTNER, OF CHEMNITZ, GERMANY.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,073, dated April 24, 1900.

Application filed July 12, 1899. Serial No. 723,600. (No model.)

To all whom it may concern:

Be it known that I, MAX GÜTTNER, a citizen of the Empire of Germany, residing at Chemnitz, Germany, have invented certain new and useful Improvements in Centrifugal Apparatus, of which the following is a specification.

My present invention relates to improvements in centrifugal apparatus, the object being to provide a device of this kind by means of which solid substances may be separated from liquid automatically and without the coöperation of attendants; and it consists in the features of construction and combinations of parts fully described hereinafter and specifically pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a vertical section on line C D of Fig. 2, and Fig. 2 is a horizontal section on line A B of Fig. 1.

Like letters and figures refer to like parts in both views.

The vertical shaft *e*, supporting the centrifugal drum, is journaled at *a* and *d* and actuated by means of a pulley *c*. The centrifugal drum is composed of a flat bottom *f*, a conical wall *g*, and a cover *h*. A flat ring *k* encircles the conical wall *g* and covers the upper circular opening *l*, provided in the receptacle *b*. Just above the bottom *f* and in the lower larger portion of the conical wall *g* are provided holes *g'*, through which the cleared liquid flows out of the drum. The solid substances leave the latter at *m*. (See Fig. 2.)

The machine-frame is encircled by means of a stationary cylindrical casing *q*, so that a free space is left between receptacle *b* and said casing, in which I arrange two inclines *n* in opposite directions. The solid substances leaving the drum at *m* come upon these inclines and move along them out from the machine. The liquid separated from the solid substances leaves the centrifugal drum *f g* through the holes *g'*. Said liquid is collected in receptacle *b* and evacuated through spout *p*.

The inner arrangement of the upright drum is as follows: A plurality of baskets or perforated boxes *w* are mounted within said drum on axes corresponding practically to chords thereof, on the one hand, by hollow journals *o* in bearings *r*, and, on the other hand, also by hollow journals in spout-like bearings *m*, secured to the wall of the drum. Said baskets or boxes are actuated by means of a central worm-spindle *i*, the lower end of which rests on the head of the drum-shaft *e*, the upper part of said worm-spindle passing through a hollow shaft or tube *s*, rigidly connected with the cover *h* of the drum and journaled in the bridge *t*. The movement is transmitted from hollow shaft *s* to spindle *i* by means of gear-wheels 1 2 3 4. Each gear-wheel 1, 2, and 4 has, for instance, twenty teeth, while the gear-wheel 3 has but nineteen teeth. The wheel 1 is keyed upon the hollow shaft *s*. Wheels 2 and 3 are made integral with one another and loosely mounted upon a stud. Wheel 4 is keyed upon the worm-spindle *i*. As the hollow shaft *s* is rotated at the same rate of speed as the drum, it will be evident that the worm-spindle is somewhat retarded on its movements. This relative movement of the spindle *i* in respect of the drum is further transmitted to the three or several baskets or boxes *w*, the toothed rims *u* of which mesh with the worm-spindle *i*.

A feed-hopper *v'*, secured to the frame of the machine, serves to receive the materials to be treated and to lead the same into the tubes *v*, secured in the cover *h* of the drum. Said tubes *v* are connected at their upper ends to form a circular opening *v''*, into which extends the hopper or funnel *v'*. Each tube *v* discharges through the corresponding hollow journal *o* into one of the above-named baskets or boxes.

The centrifugal force already produced in the tubes *v* promotes the down movement of the materials to be treated.

The drum-wall *u* is provided with numerous perforations and is made of strong sheet copper and of the form of a conical rotation body. In order to most advantageously utilize the available space, the generating-line of said body is an arc described from the axis of the drum, as clearly shown in Fig. 2, where the outer periphery of each basket nearly coincides with the inner periphery of the drum, so as to rotate in close proximity thereto.

The inner surface of the perforated wall is lined with a close wire-cloth, as indicated by hatchings in the accompanying drawings. Wing-like radial ribs *x y*, formed of sheet iron, divide the inner space of the basket *w* into several sections, (in the drawings there

are six,) so that the material adhering to the wire-cloth is properly maintained and prevented from being irregularly thrown through said inner space. The wing-like ribs comprise iron plates *z*, and two rings riveted or soldered to said plates and serving to give the ribs the necessary strength.

The improved machine operates as follows: As the centrifugal drum is rotated (at about six hundred to one thousand revolutions per minute, in accordance with the size thereof) and the baskets or perforated boxes *w* actuated by means of the worm-spindle *i*, the materials to be treated run continuously from hopper *v'* through tubes *v* and hollow journals *o* into said baskets. The materials are thrown by the action of centrifugal force in the direction indicated by arrows *z* in Fig. 2 against the sieve-wall of baskets *w*, where they are completely or partly dried. By reason of the relative movement of the sieve-basket the mass which was thrown to the outer side thereof and has now become more consistent will be moved into another zone of the centrifugal force—for instance, to *z'*. The arrows here shown indicate the direction in which the materials are thrown by the action of centrifugal force. They partly come back upon the inner surface of the basket or are partly thrown through the opening at *m*.

I wish it to be understood that I do not restrict myself to the particular construction and arrangement of parts herein shown and described, because many changes or modifications may be made therein without departing from the scope or sacrificing any of the advantages of the invention.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The automatically-acting centrifugal apparatus, having revoluble sieve-baskets arranged within the centrifugal drum, and serving to receive the materials to be treated, and separating-plates within the sieve-baskets to prevent the materials from moving backward during the rotation of the sieve-basket, substantially as set forth.

2. In the improved centrifugal apparatus, the combination with the drum mounted on a vertical axis, of horizontally-arranged rotating conical sieve-baskets mounted within said drum upon axes corresponding practically to chords thereof and having their walls described upon an arc conforming with the periphery of said drum, substantially as and for the purpose set forth.

3. In the improved centrifugal apparatus, the combination of a plurality of conical sieve-baskets, toothed rims on the larger ends of said baskets, and a vertical worm-spindle meshing with said toothed rims and arranged concentrically in relation with the shaft of the centrifugal drum of the apparatus, substantially as set forth.

4. In the improved centrifugal apparatus, the combination with the upright drum, of a plurality of rotating conical sieve-baskets mounted within said drum upon axes corresponding practically to chords thereof and having hollow journals at their smaller ends through which the solid portions of the materials under treatment are evacuated, substantially as described.

5. In the improved centrifugal apparatus, the combination with the upright centrifugal drum, and the plurality of inclosed rotating baskets mounted upon axes corresponding practically with chords of the drum, of a horizontally-projecting ring on the outer surface of said drum, dividing the latter into two zones, one receiving the discharge-openings of the sieve-baskets for the outlet of the solid portions, the other zone having openings for the outlet of liquid already separated within the centrifugal drum, substantially as and for the purpose set forth.

MAX GÜTTNER.

Witnesses:
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