

No. 773,220.

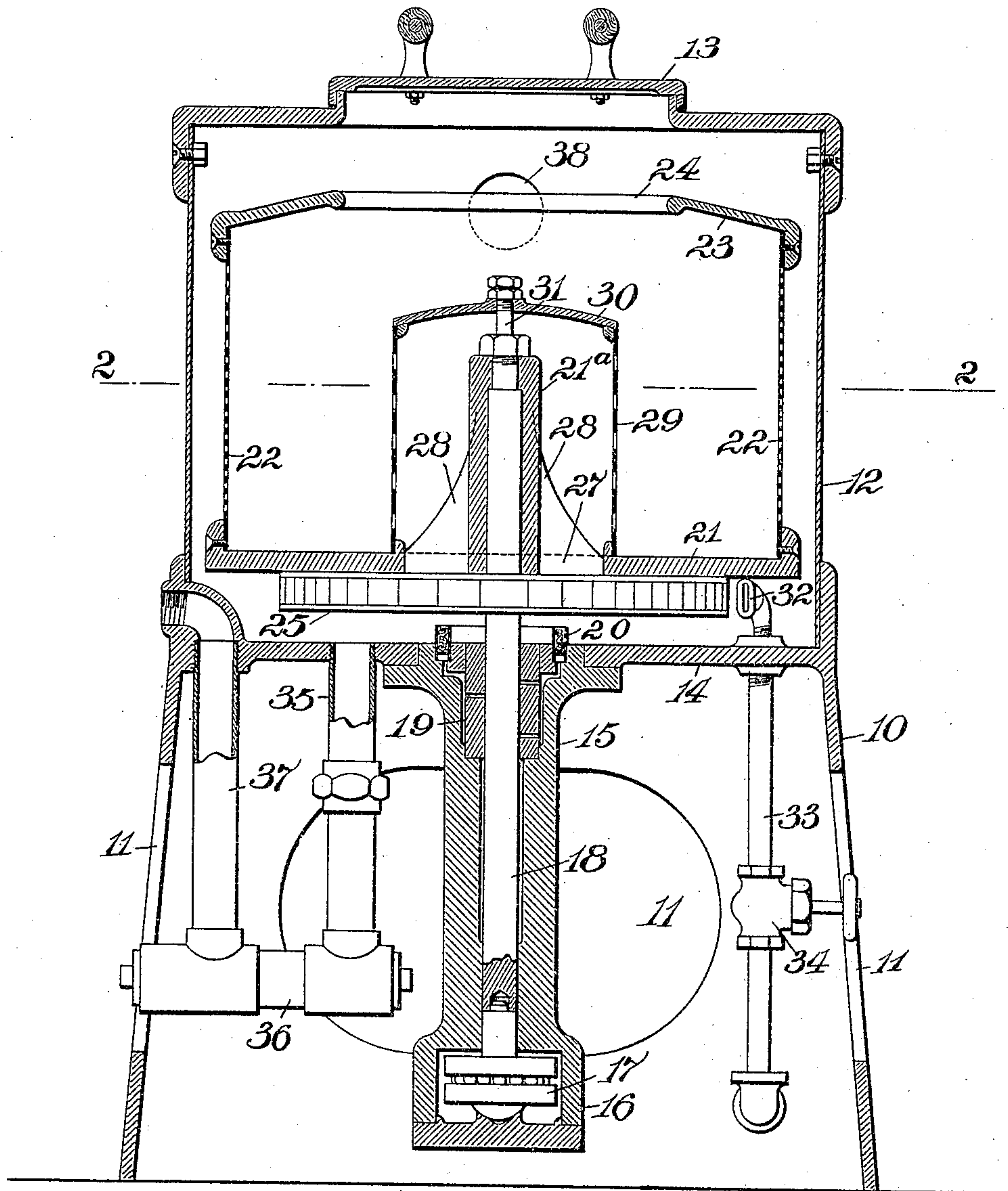
PATENTED OCT. 25, 1904.

T. S. PATTERSON.
CENTRIFUGAL MACHINE.

APPLICATION FILED JAN. 30, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

J. C. Dunbar
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Thomas S. Patterson,
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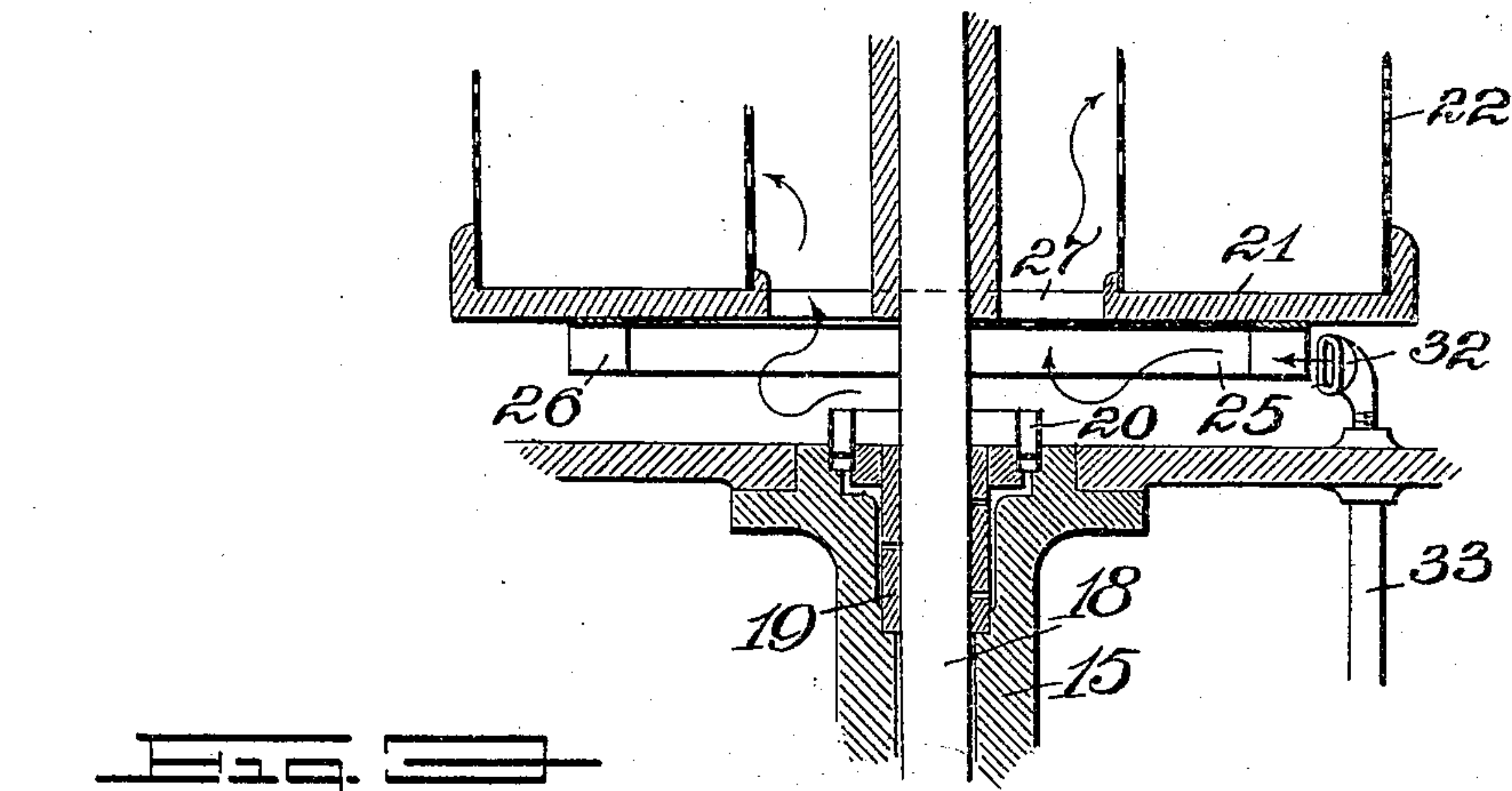
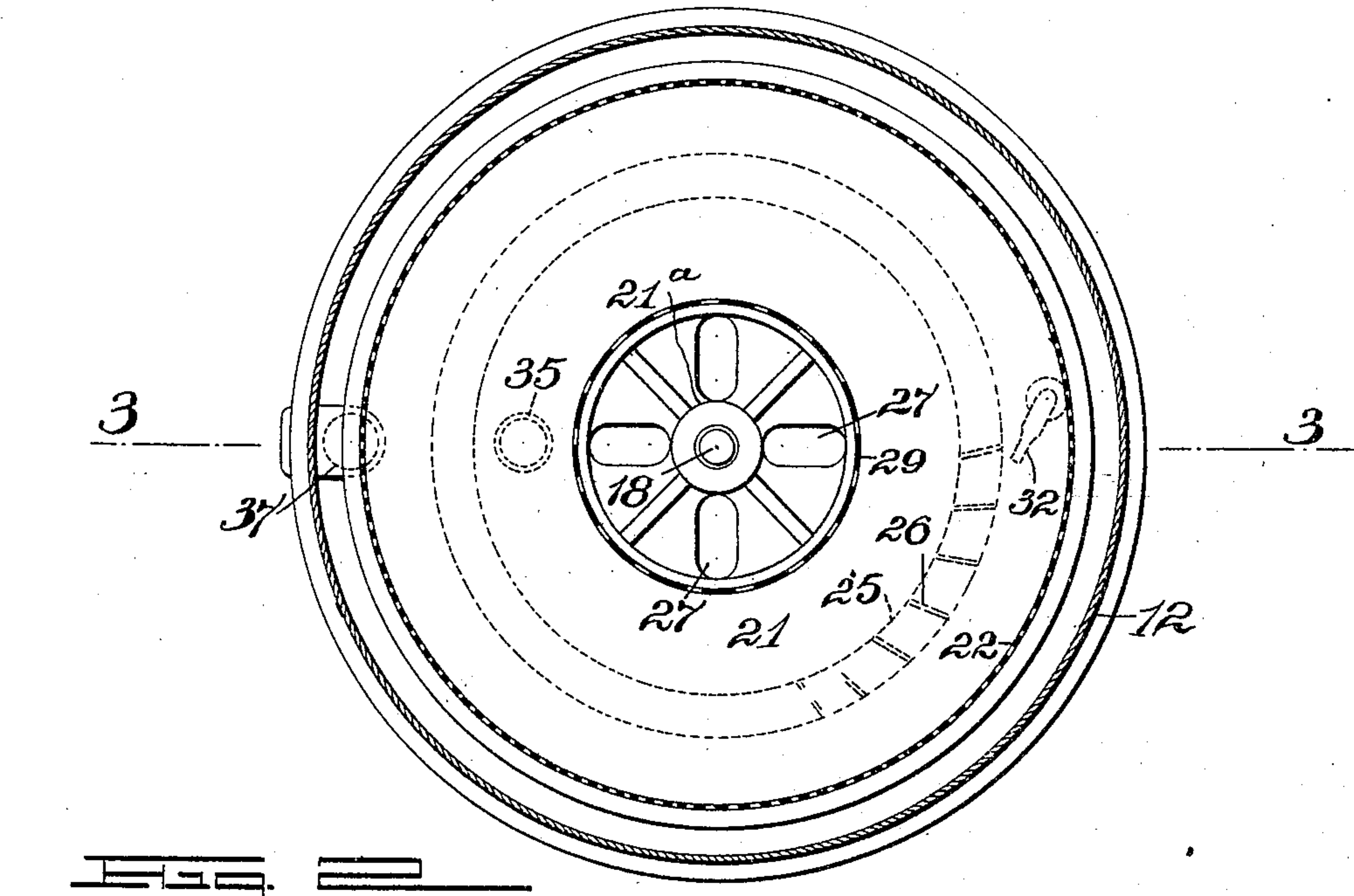
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UNITED STATES PATENT OFFICE.

THOMAS S. PATTERSON, OF NEW YORK, N. Y., ASSIGNOR TO OIL AND WASTE SAVING MACHINE COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 773,220, dated October 25, 1904.

Application filed January 30, 1904. Serial No. 191,262. (No model.)

To all whom it may concern:

Be it known that I, THOMAS S. PATTERSON, of the city, county, and State of New York, have invented certain new and useful Improvements in Centrifugal Machines, of which the following is a full, clear, and exact description.

My invention relates to improvements in centrifugal separators of the class shown in Letters Patent of the United States No. 731,215, issued to me on June 16, 1903.

My present invention relates more particularly to improved details of structure shown in my former application.

In the actual work of building and operating machines I have found that certain features could be improved, and I have therefore devised a better scheme of operation by which the machine may be efficiently driven, the steam allowed to permeate the mass of material under operation, and the oil extracted, properly trapped, and conveyed away.

Like my former invention, this one is intended to extract grease or oil from waste or other fibrous material, and my present invention relates to a very simple, efficient, and easily-controlled machine by which the said matter can be rapidly treated with the most excellent results.

With these ends in view my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a central vertical section of the machine embodying my invention. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1, and Fig. 3 is a broken detail section on the line 3 3 of Fig. 2.

Instead of using a supporting-standard I provide a substantially hollow base 10, the sides of which are preferably provided with openings 11, so as to permit easy access to parts of the machine which lie within the base, and the base supports an inclosing casing 12, which is provided with a suitable top opening

closed normally by a cover 13. The casing has a tight bottom 14, and this supports the depending hanger 15, which is tubular in form and terminates at its lower end in a box 16, the latter serving as a support for the ball-bearing 17 and the former or hanger carrying the vertical shaft 18, which rests on the bearing and extends upward through a suitable side bearing 19 into the casing 12. Obviously the ball-bearing 17 may be of any approved type, as may also the bearing 19, and above the bearing 19 I arrange a screen-box 20, in which a packing may be placed to serve as a filter, so that filtered oil will find its way down through the packing and lubricate the bearings 19 and 17.

The upper end of the shaft 18 carries a rotary drum comprising an essentially solid bottom or plate 21, the perforated side wall 22, preferably of screening, and the top 23, which has an opening 24 to provide for the insertion of material into the cage and for the easy removal of the same.

It will be noticed that I make the drum very plain and simple, so as not to complicate the mechanism, and that the bottom is perfectly plain except for the openings therein, which will be presently described.

The drum, which turns in the casing 12, may be driven in any approved way; but as steam is essential to the easy removal of oil from the fibrous material under treatment I prefer to drive the drum by a steam-turbine, so that the steam which does the turning may also serve to limber up the material and free the grease. To this end I attach a turbine 25 directly to the bottom plate 21 of the drum, and the turbine may be of any approved kind. In practice I have used simply the straight plates 26, which are suitably supported and tangentially arranged, so that the steam will strike them in a way to propel the turbine and the drum thereto attached. The cage is preferably supported as shown in Fig. 1, where it has a central core or hanger 21^a, which fits on over the upper end of the shaft 18, and at intervals around the core or hanger are holes 27, so that the steam from the turbine may rise

through the holes into the mass of material in the drum. Between the holes are ribs 28, connecting the bottom 21 with the core 21^a and serving the double purpose of strengthening the drum and of dividing the steam so that it will be delivered evenly to the several parts of the drum. The core 21^a, the ribs 28, and the holes 27 are protected by an inner screen or basket 29, which is screwed to the bottom plate 21 and has a top plate 30 attached, as shown at 31, to the top of the shaft 18, so that all the parts of the drum are carried together and a firm simple structure is produced. The steam-nozzle 32 is directed against the plates of the turbine 25, this nozzle being arranged in the space between the bottom plate 21 and the bottom 14 of the casing 12, and the nozzle is supplied by a steam-pipe 33, having a suitable valve 34 to control it.

The extracted oil passes downward through the pipe 35, which, in connection with the double-elbow pipe 36 and vertical pipe 37, forms a trap, so that the oil extracted, together with the water of condensation, passes through the trap, and a part of the sediment is thus trapped off and can be removed in the usual way. It will be noticed that the discharge of the trap is slightly higher than the intake, this arrangement being made so as to balance the back pressure of steam in the drum 12 and cause a natural flow. This permits the oil to be above the bearings of the machine and also prevents the steam, oil, and water from blowing off too rapidly. To provide relief for the casing 12, an opening 38 is made in it near the upper part thereof.

When the machine is to be used, the oil-waste or other material is placed in the cage through the opening in the top of the casing 12 and the opening 24 in the cage. The cover 13 is put in place and the steam turned on through the pipe 33. The turbine, and consequently the waste-carrying cage, are instantly set in rapid motion, and the mass of material is warmed up by the steam which fills the casing 12, so that the oil is made very liquid and is by the centrifugal motion thrown outward through the screen 22 and passes out through the outlet described.

I have found that the machine works with great efficiency, extracts practically all the oil, and leaves the waste in good condition for reuse. Obviously most oil-containing materials can be similarly treated with a view of saving the oil.

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

1. A centrifugal separator comprising an inclosing casing, means for admitting steam into the said casing, and a drum mounted to rotate in the casing, said drum having a per-

forated side wall, a bottom plate with means for admitting steam therethrough, and a screen-cover for the inlet through the bottom plate.

2. A centrifugal separator, comprising a steam-casing, means for admitting steam thereto, a trapped outlet for the steam-casing, and a drum rotating in the steam-casing on a vertical axis, the said drum having an open top, perforated sides, a bottom with means for admitting steam therethrough, and a screen-cover for the steam-inlet through the bottom.

3. A centrifugal separator, comprising an inclosing steam-casing, a rotatable drum mounted to turn within the casing, the said drum having a perforate side wall, a bottom plate with steam-openings therein, a screen-cover for the openings in the bottom plate, a turbine operating to turn the drum and a steam-jet pipe delivering against the turbine.

4. A centrifugal separator, comprising a suitably supported steam-casing having a top opening and a trapped outlet, a hanger supported from the bottom of the casing, a vertical shaft mounted in the hanger, a rotatable drum carried by the shaft and lying within the casing, and means for admitting steam to the casing.

5. A centrifugal separator, comprising a steam-casing having a top opening and a bottom outlet for oil, a hanger supported on the bottom of the steam-casing, a shaft mounted in the hanger and projecting upward into the steam-casing, a steam-turbine on the shaft, a steam-pipe delivering against the turbine, and a drum carried by the shaft, said drum having perforate side walls and steam-openings in the bottom, and a screen-cover for the steam-openings.

6. The combination with the steam-casing having a suitable steam-inlet and oil-outlet, of the vertically-mounted and rotatable shaft in the casing, and a drum carried by the shaft, said drum comprising a bottom plate having steam-openings therethrough, a central core mounted on the shaft, ribs between the steam-openings, a screen-cover for the steam-openings, and perforated side walls.

7. The combination with the steam-casing having a steam-inlet and an oil-outlet, of the steam-driven drum mounted to turn on a vertical axis in the casing, and comprising perforated side walls, a top with an opening therein, a bottom plate with steam-openings therethrough, and a screen-cover for the steam-openings.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS S. PATTERSON.

Witnesses:

THERON DAVIS,
J. G. DUNBAR.