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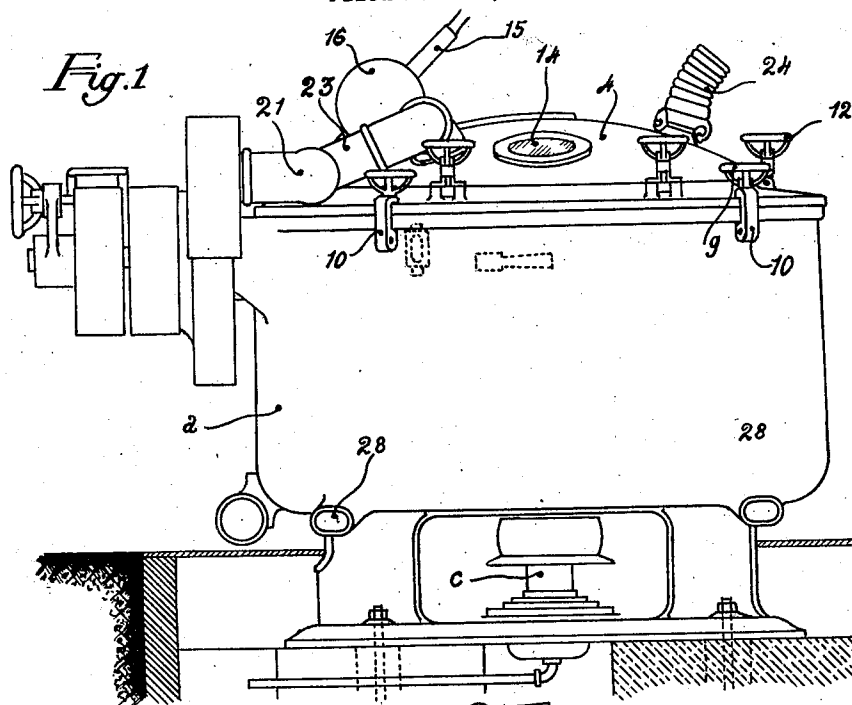
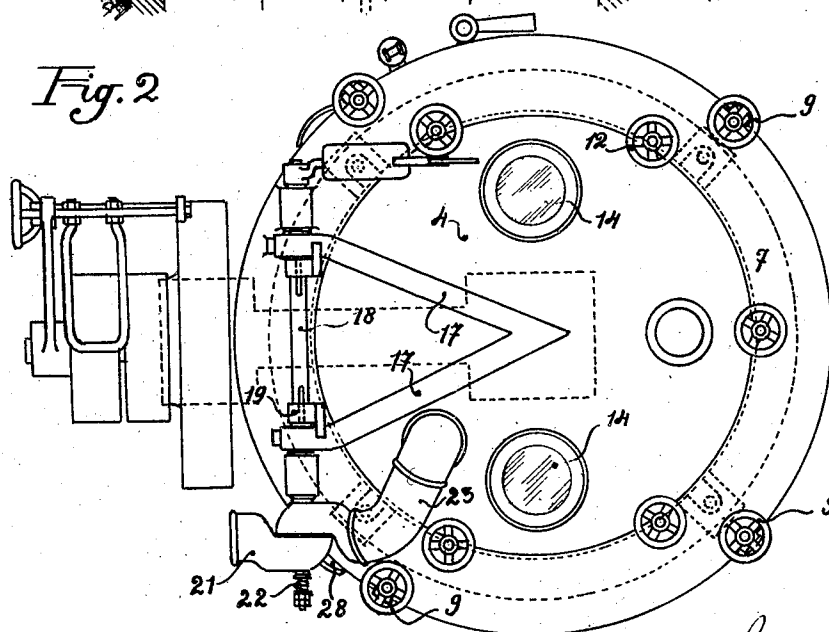
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1,844,008

CENTRIFUGAL AUTOCLAVE, PERMITTING THE RECOVERY OF VOLATILE PRODUCTS

Filed Dec. 27, 1928

3 Sheets-Sheet 1



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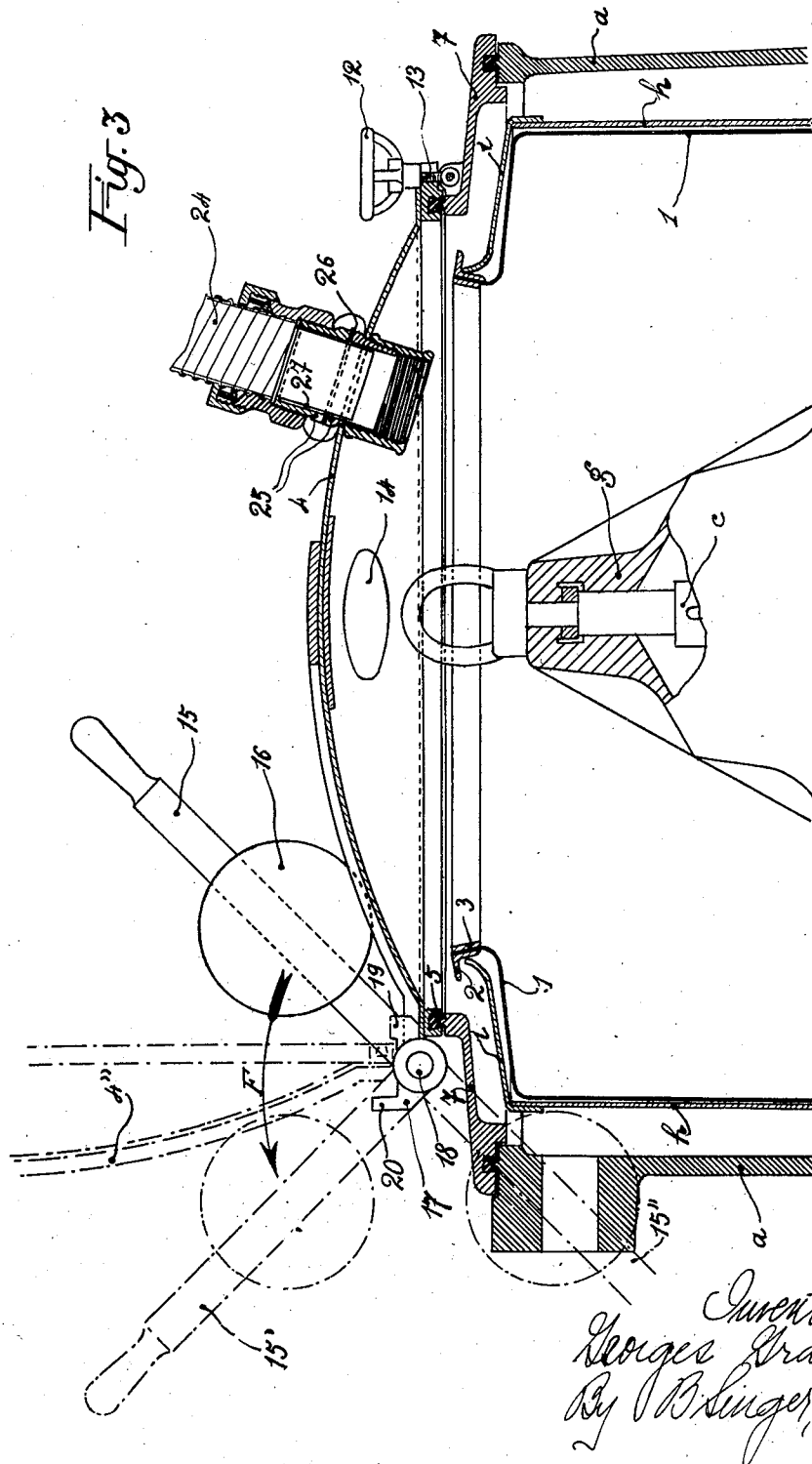
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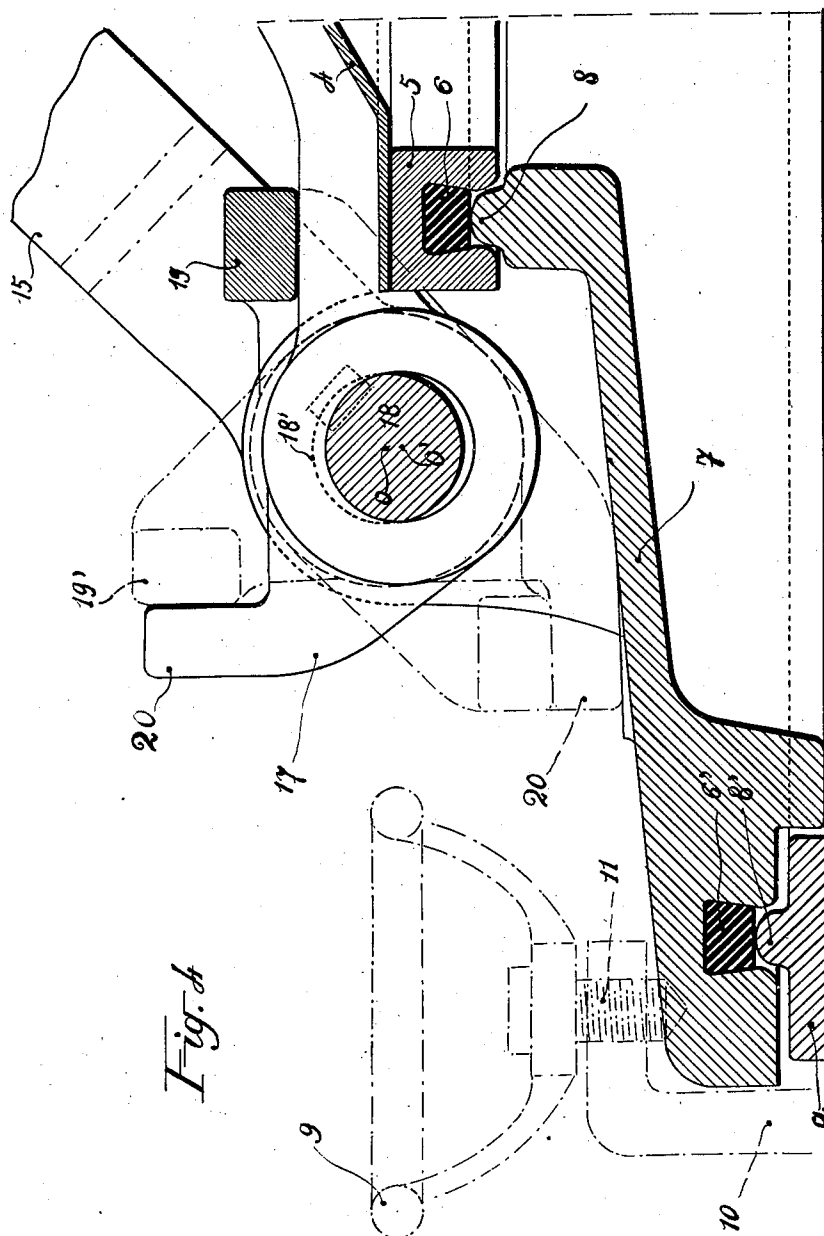
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CENTRIFUGAL AUTOCLAVE PERMITTING THE RECOVERY OF VOLATILE PRODUCTS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CENTRIFUGAL AUTOCLAVE PERMITTING THE RECOVERY OF VOLATILE PRODUCTS

Application filed December 27, 1928, Serial No. 328,757, and in France December 28, 1927.

The present invention relates to centrifugal machines, and its object is to devise a centrifugal autoclave permitting the recovery of volatile products, such as alcohol, petrol and the like, and permitting at the same time the working either in vacuum or under pressure, at all desired temperatures, without contact with outer air susceptible to decompose or to alter certain constituents.

In the centrifugal autoclave according to the present invention use is made of the drying centrifugal machine containing an instantly removable basket, such as described in U. S. A. Patent No. 1,573,240 of Feb. 16, 1926, of the applicant and characterized by that a vertical shaft transmits its rotary movement to a basket through the medium of friction segments carried along by said shaft and applied by centrifugal force directly against the interior of said basket in order to ensure its rotation, this basket being removable at rest after release of the brake.

Amongst the advantages of such a device are quoted:

- a. Its very great revolving speed;
- b. The direct starting of the basket and also its direct braking, hence increase of efficiency;
- c. The progressive and adjustable carrying along, hence economy of the motive power;
- d. No soiling of the treated product, the driving gear being placed in the lower part of the machine; no manipulation with the treated product, owing to the removability of the baskets;
- e. Working safety owing to the independence of the baskets from the driving shaft;
- f. Increase of the efficiency by employment of supplementary, interchangeable baskets.

To transform this drying machine into a recovering apparatus for the solid material treated, various improvements have been effected, such as means so that the basket, on stopping and after loosening the brake can be directly removed for emptying its load, the provision of a filtering device within the basket which assumes the form of the basket while the machine is running and avoids any contact between the material treated and the metallic parts as well as permitting of the entire recovery of the solid material treated

which remains in the basket. The upper edge of the filtering device is detachably clamped between an annulus of angle iron and an internal conical clamping collar, these and other features of the present improvements being more readily seen from the following description with reference to the accompanying drawings, in which—

Figure 1 is an elevation of the whole apparatus,

Figure 2 its plan view,

Figure 3 a sectional view of the cover of the digester, and

Figure 4 a detail of the latter on a larger scale.

The barrel *a* constituting the pedestal or socle, the vertical shaft *c* and its driving gear are constituted in the usual way.

The basket which receives the materials to be dried or impelled consists of a hub *g* (Fig. 3) of appropriate form serving as a bottom, on which is secured a circular casing *h* of suitable type according to the treatment to be carried out and which is surmounted by a hood *i*.

To avoid all contact between the material being treated and the metallic walls of the basket, there is mounted at the interior of the basket and of the same form, a flexible filtering pocket 1 simply held at the upper part between the annular flange 2 of angle iron and the internal conical clamping collar 3.

To produce by hand the release of the pocket it suffices to lift from under the flange 2.

In practice the cylindrical wall portion of the pocket is stiffened by whalebone appropriately spaced apart.

By the removal of the filtering pocket (without removal of the basket or after its removal) the substance treated is wholly recuperated, nothing remaining in the basket; this advantage is especially noticeable in case of treating precious substances.

The filtering pocket 1 can be made of different tissues and of different meshes. It is possible to intercalate in certain cases a metal sheet or cloth between the basket *h* and the pocket 1 in order to hasten the filtration.

The centrifugal digester ought to permit the working in the vacuum or, on the contrary, under pressure (certain products being treatable in one way and other in the other way), at any temperature according to the treatment in view. For this purpose the bulged cover 4 is soldered to a steel crown 5 provided with a circular groove 6 (Fig. 4) receiving an appropriate joint, for example india rubber.

An intermediate collar 7 is provided with a circular edge 8 penetrating into the groove 6 and squeezing the joint in such manner that the latter is protected against all products liable to attack it.

The intermediate collar 7 bears tightly on the vessel *a* and effects a hermetic joint therewith by means of a soft ring 6' and a flange 8'.

The intermediate collar 7 is secured on to the vessel *a* by means of stirrups 10 (Figs. 1 and 4) articulated with their lower parts to the vessel *a* and carrying fastening screws 11 actuated by hand wheels 9.

In a similar way, hand wheels 12 screwed upon spindles 13 articulated to the collar 7 detachably secure the cover 4 to this collar (Fig. 3).

In certain cases the supplementary collar 7 can be omitted.

The cover carries two glazed windows 14 which enable the interior of the dryer to be inspected, a luminous source being installed above one of these windows and the inspection being effected across the other window.

The cover can be swung by means of a lever 15 provided with a counter-weight 16 for equilibration.

In order to effect this swinging, the cover 4 carries, riveted to it, a hinge 17 (Fig. 2), with two arms and forming in the plan view a V, articulated at 18. To the axle 18 two raising cams or pawls 19 are fixed (Fig. 4) as well as the controlling lever 15 at one extremity of the axle.

This axle is oval where it enters the hinge 17, the upper half of the circumference being circularly reduced in diameter by being turned around a center O' situated some millimeters below the longitudinal axis O of the shaft 18, and the boring of the hinge 17 corresponding to the original diameter of this shaft.

Consequently the resting cover is permitted a vertical play of a few millimeters; when pressed by cams 19 (Fig. 4) the cover compresses owing to the action of the counter-weight 16, the joint 6, whereby a perfect security is ensured.

When lifting the lever 15, in the direction of the arrow F into the position 15', the cams 19 abut at first against the projection 20 of the hinge 17 connected to the cover and, from this instant the lever 15 and the cover move together around the axis of the hinge 17.

In this first action, the cover is opened at the joint 6, the action of the counterweight being neutralized owing to the eccentricity of the hinge 17 upon the shaft 18; in fact, the oval part of this shaft, forming a cam, arrives at 18' (Fig. 4) and raises the cover by the distance O'-O.

During the continuation of the rotary movement of the lever 15 from 15' up to 15'' (Fig. 3), the cam 19 abutting against the projection 20 of the hinge swings the cover 4 into the vertical position 4''; at the same time, the nose 20 rises and abuts against the collar 7, so that the amplitude of the swinging movement is limited.

23 are one or several rigid pipes or tubes provided with articulated joints 21 fitted into the swinging axle 18, said parts being pressed against each other by a spring 22 wound at the end of the axle 18.

Consequently, the tubes 23 are rigid members connected to appropriate receivers, and it is possible to lead any fluids through them, for example, hot air, in order to utilize the apparatus as drying machine.

The current of hot air arriving from an appropriate generator (for example burners or a steam radiator) may be sucked in, in this particular case, in the middle of the apparatus, by the centrifugal rotation produced as known, at great speed; for this purpose no blasting or sucking ventilator is needed.

Independently of these rigid tubes 23, a flexible tube 24 may be provided, with rapid joints 25, for the admission of the liquid, a leather washer or the like 26 being intercalated, this joint being protected by an inner shell 27 of thin sheet-metal soldered to the borders of the upper socket of the rapid joint, with a slight play in the lower socket. This embodiment avoids any attack of leather or the like as well as of the circular tightening joints of india rubber or the like.

It is indispensable to render possible the working of the substance without any contact with the exterior air, owing to the fact that certain treated products are decomposed by contact with air. In order to avoid such contact, the emptying gulleets 28 may be connected to appropriate tubes.

For the same purpose a tight joint can be provided between the shoulder of the vertical shaft *c* and the part with radial partitions, utilized for the transmission of speed to the basket *b*.

The invention permits of numerous applications, for drying, filtrating, decanting, centrifuging, washing, impregnation, recuperation, wringing, and so on, under pressure or in the vacuum, at any temperature and in security against all communication with the exterior. In case of emergency, for example in order to ensure wringing without evaporation, modifications may be made in the form, construction and proportion of the various

parts within the scope of the appended claims.

What I claim, is:

1. In a centrifugal machine, a fixed barrel, a removable supplementary collar thereon
5 having bearings, a cover having a hinge member, an axle mounted in the bearings on the supplementary collar, and on which axle the hinge member is journaled, said axle having a cam arranged to cooperate with the
10 hinge member to press the cover tightly on the supplementary collar, means to turn the axle, and means with which the axle and hinge member are provided to limit the extent of rotation of the axle and hence also the
15 extent of angular movement of the cover.

2. In a centrifugal machine, a barrel, a driving shaft, a removable basket within said barrel, on said shaft, a filtrating pocket within said basket, means to drive the shaft, a
20 ring on said barrel, means to fasten said ring to the barrel, a cover on said ring, means to fasten said cover to said ring, a hinge on said ring for the cover, a counterweighted lever attached to the axle of said hinge, two lifting
25 pawls keyed to said axle, to cooperate with said lever, and means to ensure automatic removal of the cover from said ring, when turning said lever.

3. In a centrifugal machine, a fixed barrel,
30 a driving shaft, a removable basket within said barrel, on and revoluble with said shaft, a filtrating pocket within said basket, a ring fastened to said barrel, a cover hinged to said ring, an oval axle of said hinge, to ensure
35 lifting of the cover when turning said axle, a tube connected to said cover, a tube attached to the fixed part of the machine and a flexible joint between said tubes.

4. In a centrifugal machine, a fixed barrel,
40 a driving shaft, a removable basket on and revoluble with the latter, a filtrating pocket within said basket, means to drive the shaft, a cover for said barrel, means to fasten it, means to lift it, rigid admission tubes on said
45 cover, tubes on the fixed part of the machine, articulations between them, a spring to apply the articulated tubular parts against each other, a rapid joint in the cover for attachment of a flexible tube, for admission of a
50 treatment agent, and means to empty the contents without admission of outer air.

In witness whereof I affix my signature.

GEORGES GRAUSS.

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