

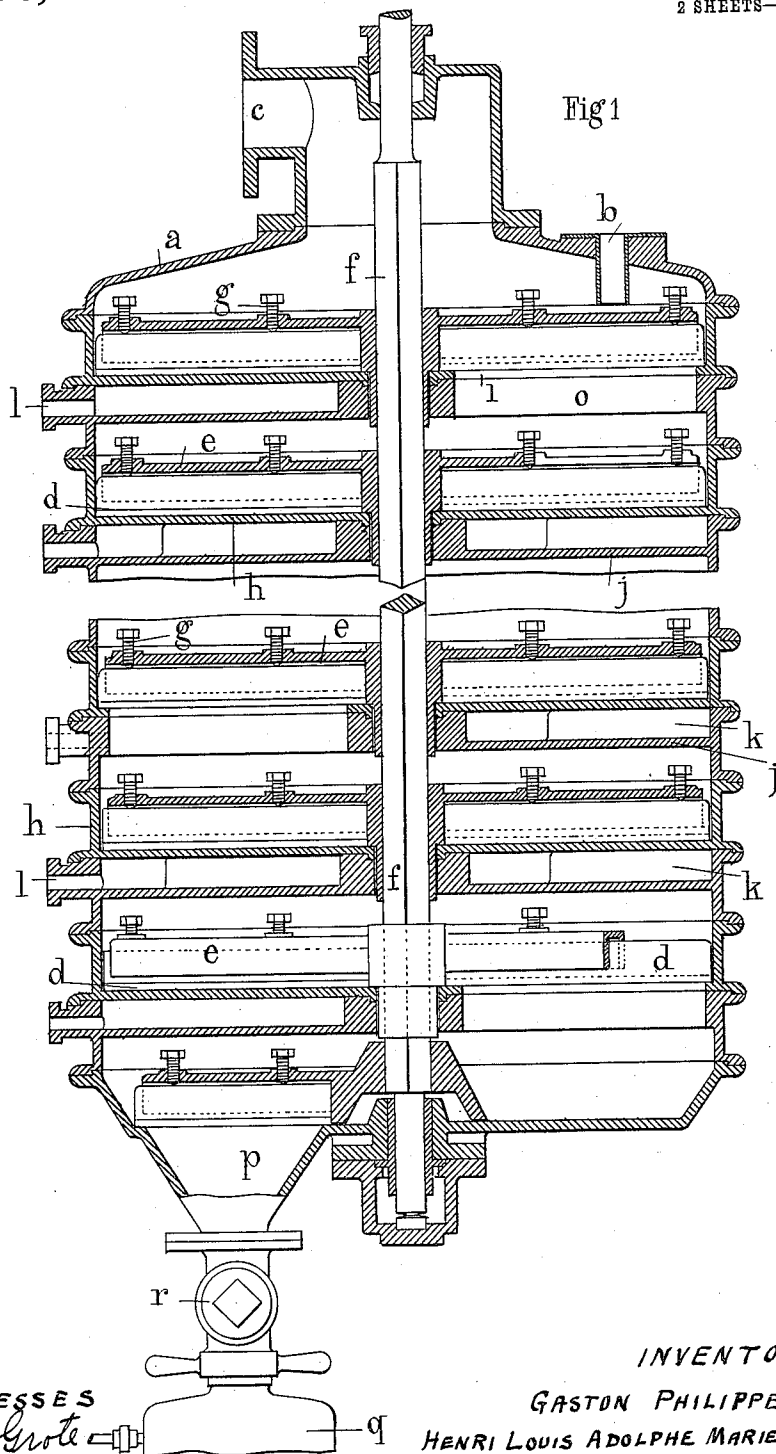
G. P. GUIGNARD & H. L. A. M. WATRIGANT.
 COLUMN FOR THE DRYING OF LIQUIDS, PASTY MATERIALS, OR SOLID MATTER.

APPLICATION FILED MAY 27, 1911.

Patented Aug. 20, 1912.

2 SHEETS—SHEET 1.

1,036,486.



WITNESSES
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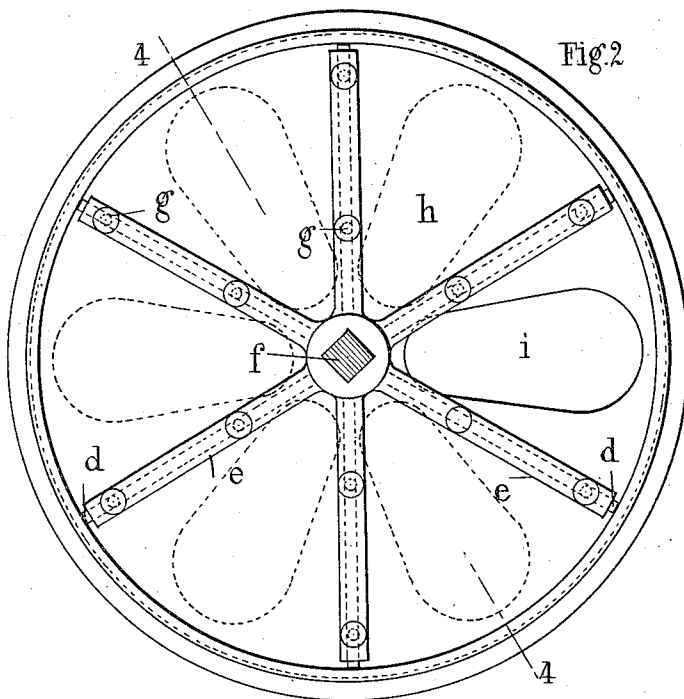


Fig. 2

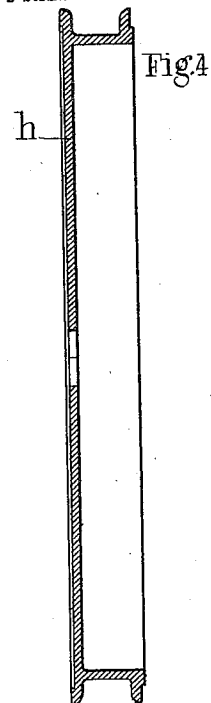


Fig. 4

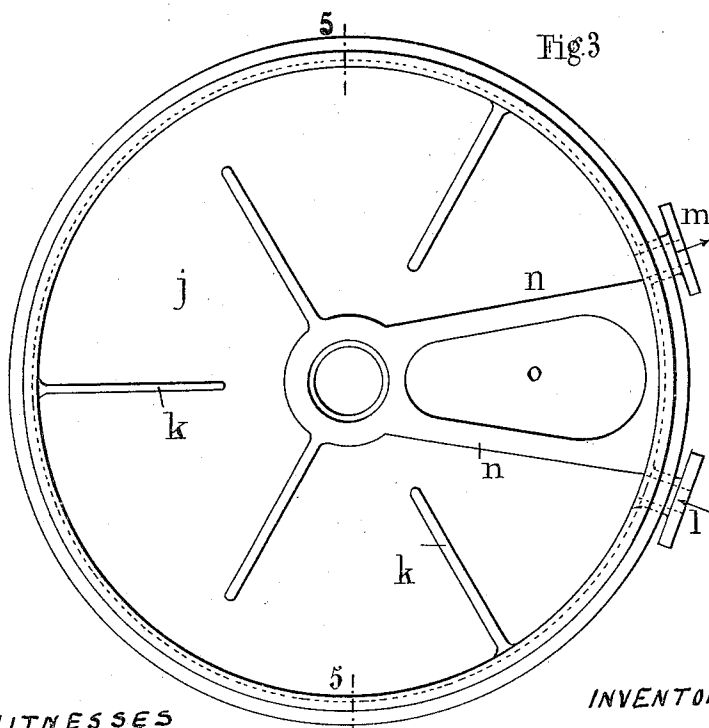


Fig. 3

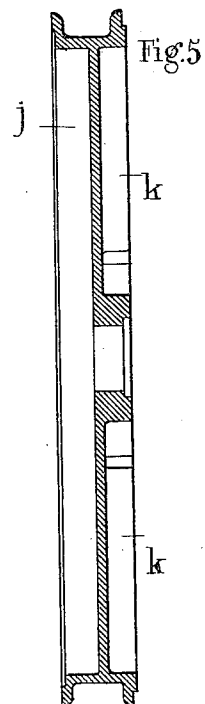


Fig. 5

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UNITED STATES PATENT OFFICE.

GASTON PHILIPPE GUIGNARD, OF MELUN, AND HENRI LOUIS ADOLPHE MARIE
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COLUMN FOR THE DRYING OF LIQUIDS, PASTY MATERIALS, OR SOLID MATTER.

1,036,486.

Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed May 27, 1911. Serial No. 629,837.

To all whom it may concern:

Be it known that we, GASTON PHILIPPE GUIGNARD, a citizen of the Republic of France, and a resident of Avenue des Mar-
5 ronniers, Melun, Seine and Marne, France, and HENRI LOUIS ADOLPHE MARIE WATRIGANT, a citizen of the Republic of France, and a resident of 48 Façade de l'Esplanade, Lille, Nord, France, have invented a new
10 and useful Column for the Drying of Liquids, Pasty Materials, or Solid Matter, of which the following is a specification.

This invention relates to an apparatus
15 or column for the drying of liquids, pasty materials, or solid matter.

The apparatus which forms the subject
of the present invention consists of a column
or pile of superposed plates; the divisions
are separated from one another by two
20 plates, between which there circulates the heating medium, such as steam, liquid heated to a fixed temperature, hot waste gases from any source, or other suitable source of heat.

25 The sections communicate with one another by an opening in the shape of a circular sector; these openings are arranged in a helix in such a manner that the product falling from the upper plate is obliged to
30 make a complete turn upon the plate next below before passing to the following plate. This condition is obtained by means of scraper blades arranged along radii of the circle of the column and movable around its
35 axis, being operated by a vertical shaft which passes from top to bottom of the column. The blades have also another purpose in addition to that mentioned; they scrape the heating plates and prevent their
40 surface from becoming covered with a heat resisting coating formed of the material under treatment.

The top cover carries a pipe for producing a vacuum in the apparatus, and an entrance for material. The feeding device
45 depends upon the nature of the substance to be dried.

The lower cover or bottom carries an extraction flask to allow the removal of material without breaking the vacuum.
50

An armhole is provided in each section to allow of changing or adjusting the blades without requiring to take down the column.

The invention is shown by way of ex-

ample upon the accompanying drawings, in 55
which:—

Figure 1 is a longitudinal section of the column. Fig. 2 is a plan of one of the types of disk employed. Fig. 3 is a plan of the other type of disk employed. Fig. 4 is a
60 section upon line 4—4 of Fig. 2. Fig. 5 is a section on line 5—5 of Fig. 3.

In these drawings, *a* is the top cover of the apparatus, *b* the entrance for material, *c* the vacuum connection, *d* the scraper
65 blades which are fitted to blade-carrying spiders *e* secured upon the central shaft *f*; *g g* are screws which allow of adjusting the pressure of the blades upon the bottom of the plates, while *h* is the upper plate carry-
70 ing the blades and upon which the material to be dried is received in the sector formed by two adjacent blades.

i is the opening through which the material after being passed over the whole sur-
75 face of the plate falls upon the plate immediately beneath. *j* is another plate which forms as it were the bottom of a box, of which *h* would be the lid. This plate *j* is divided by partitions *k* which force the
80 heating medium entering therein to impinge upon all parts of the heating surfaces. This medium enters through an opening *l* and leaves through another opening *m*. A wall *n* extends around the opening *o* which
85 is similar to and coincident with the opening *i* in the plate *h*. This wall also prevents direct passage of the medium from the entrance to the exit.

p is a hopper through which the dried
90 material after having passed over all the plates, is delivered to the vacuum flask *q*.

r is a cock which allows the column to be cut off from the flask *q*.

The apparatus works in the following
95 manner: The material to be dried is introduced through the pipe or entrance *b* and received in the sector-shaped space formed by two adjacent blades. The blades *d* operated by the shaft *f* advance the material and
100 pass it over the whole surface of the plate *h* until it reaches the opening and falls upon the second plate *h* placed immediately below. Upon this plate the material is also received in a sector-shaped space similar to
105 that of the preceding plate; the blades impart to the material a similar course over the new plate until it reaches the opening

where it falls upon the following plate on which it is received in the same way as on the preceding ones. The operation is repeated as many times as there are plates in the column. The openings of the plates being arranged in a helix upon the consecutive plates, the material to be dried traverses in the column the longest possible path before being received in the vacuum flask. On the other hand the arrangement of the partitions upon the lower plates compels the heating medium to pass likewise over all parts of the plates and so to distribute the heat. This column may serve for numerous purposes, more especially: (1) as concentrator for liquids containing crystallizable products; (2) as complete drying column for liquids, such as vinasse, pasty substances, or moist residues of any substances; (3) as vacuum-still for any materials, such as glycerin; (4) as vacuum-concentrator for the manufacture of gelatin, condensed milk, etc.; (5) as vinasse-boiler for heating distillery wines by means of steam derived from the vinasse itself and thereby to produce a concentration of this vinasse which is subsequently completely dried.

It is evident that the present invention is not limited to the details of construction

which have been given only by way of example. For instance the entrances and exits for the heating medium will be of dimensions and shape suited to the nature of the fluid employed.

Having thus described our invention what we claim as such and desire to secure by Letters Patent is:—

In a drying column of the character described, a series of superposed heated drying plates, and rotary scraping arms in contact with the upper surfaces of said plates serving not only to pass the material under treatment over said plates but also to remove adherent material from the surface of said plates, said scraping arms comprising channeled blade carriers, blades fitted within said channels and pressure screws passing through said carriers and bearing upon the upper edges of the blades to force them down against the surfaces of the drying plates, substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses.

GASTON PHILIPPE GUIGNARD.

HENRI LOUIS ADOLPHE MARIE WATRIGANT.

Witnesses.

DEAN B. MASON,

LEON PEILLET.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."