

(No Model.)

2 Sheets—Sheet 1.

V. J. KUESS.

PROCESS OF AND APPARATUS FOR DISTILLING FATTY SUBSTANCES.

No. 568,258.

Patented Sept. 22, 1896.

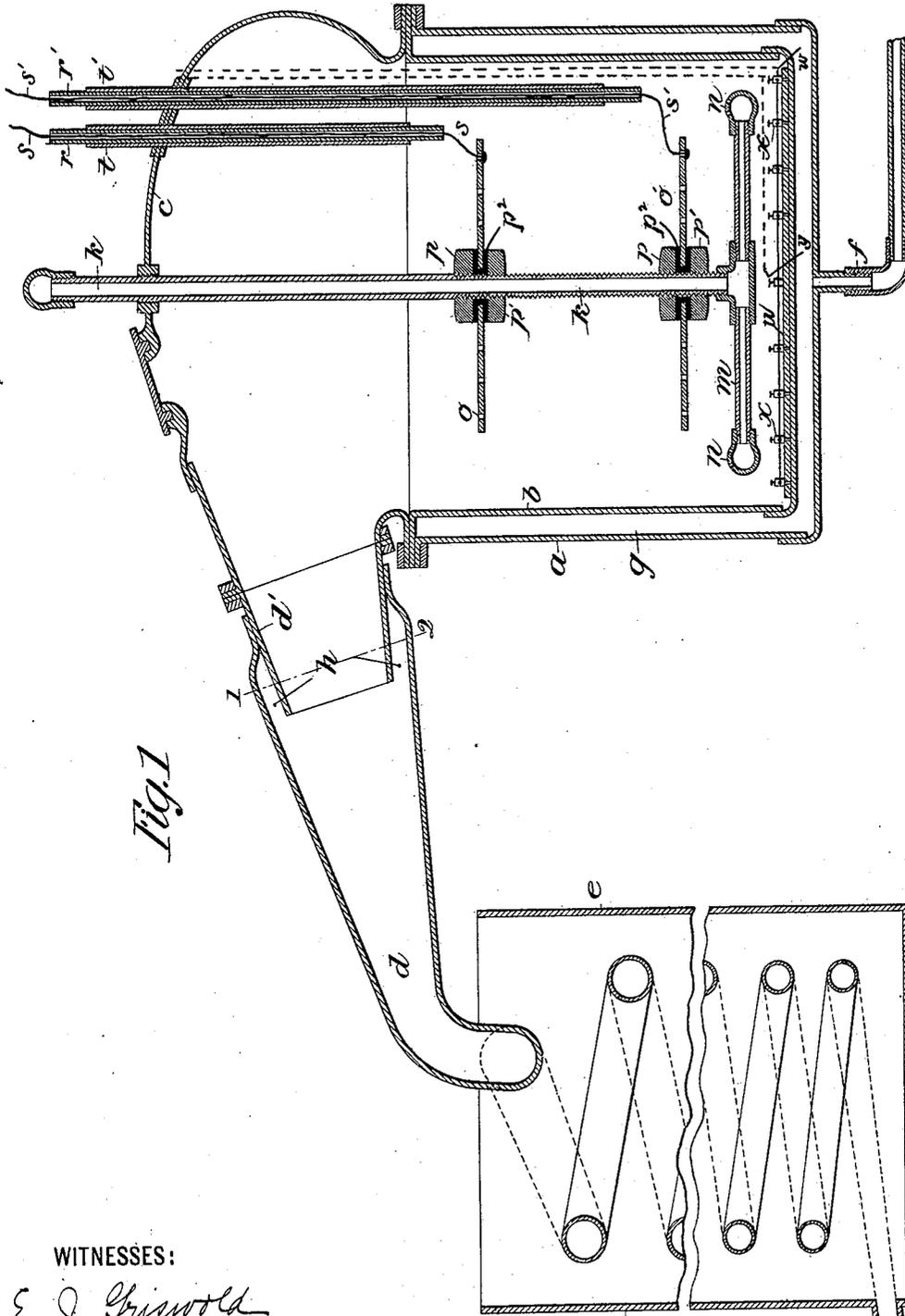


Fig. 1

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Fig. 2.

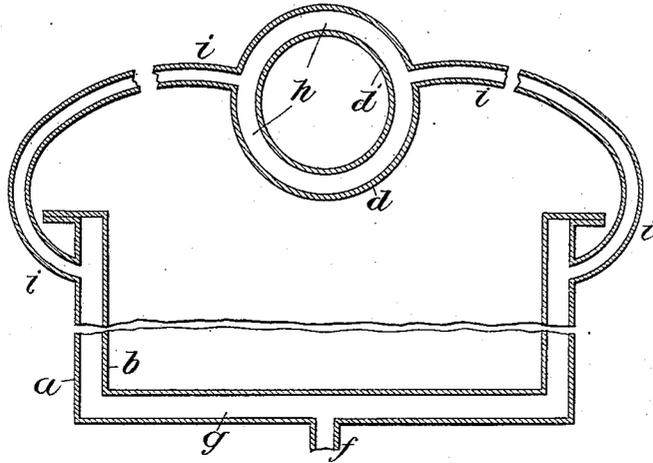


Fig. 3.

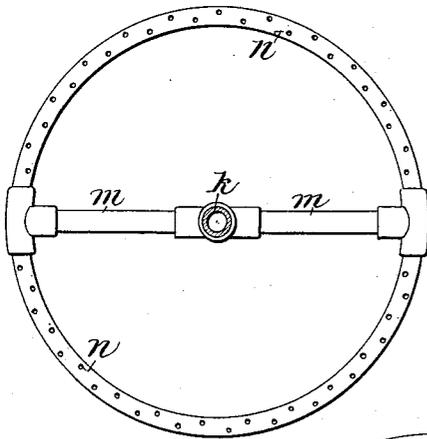


Fig. 4.

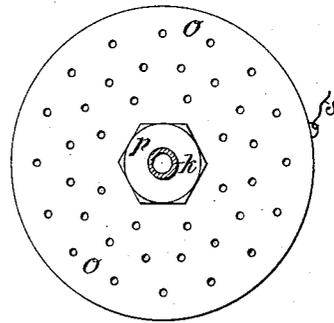


Fig. 5.

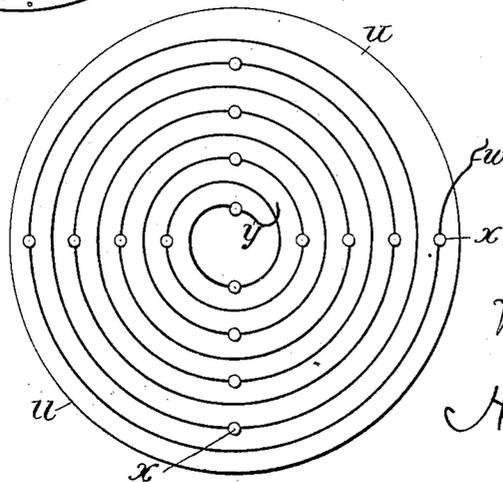


Fig. 6.



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UNITED STATES PATENT OFFICE.

VICTOR JOSEPH KUESS, OF BORDEAUX, FRANCE.

PROCESS OF AND APPARATUS FOR DISTILLING FATTY SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 568,258, dated September 22, 1896.

Application filed April 6, 1895. Serial No. 544,790. (No model.) Patented in France September 10, 1894, No. 241,211.

To all whom it may concern:

Be it known that I, VICTOR JOSEPH KUESS, chemist, a citizen of the Republic of France, residing at Bordeaux, (Gironde,) France, have invented certain new and useful Improvements in Processes of and Apparatus for Distilling Fatty Substances Generally, and Particularly Gum and Resin, with the Aid of an Electrical Current or of Electrolysis, (for which I have obtained a French patent, dated September 10, 1894, No. 241,211,) of which the following is a specification.

My invention relates to a process for distilling fatty substances generally, and particularly gum and resin, with the aid of a current of steam and an electrical current or of electrolysis, and to retorts for carrying out this process; and the objects of my improvements are to construct a retort capable of being used singly, instead of two distinct retorts, as required to be used in existing apparatus, for the extraction of spirits of turpentine and oil of resin; to render practicable the introduction of steam within the retort during the process of distillation; to obtain results in a shorter time by the use of my improved retort than is required by the apparatus hitherto employed in distilling fatty or resinous substances, and to avoid the escape of unpleasant fumes and vapors usually emitted in the distillation of hydrocarbons of the turpentine series in retorts of ordinary construction.

My process consists in subjecting the substances to the action of an electric current and a current of steam simultaneously, thereby chemically decomposing the substances. I carry out this process and attain the objects mentioned by the construction and arrangement hereinafter described with reference to the accompanying drawings, upon which—

Figure 1 is a vertical section of a retort constructed according to my invention and shown with a refrigerator in position, Fig. 2 being a section on line 1 2 of Fig. 1 and also showing the lower part of the outer casing and boiler. Fig. 3 is a plan of the arrangement of steam-pipes within the boiler. Fig. 4 represents a plan of one of the perforated disks surrounding the central steam-pipe, showing the connection of an electrical conductor to the same. Fig. 5 is a plan of a su-

perheater-plate and spiral wire with its connecting-studs, and Fig. 6 is a vertical section of one of the connecting studs and screws with the conducting-wire inserted therein.

Similar letters refer to similar parts throughout the several views.

The apparatus consists of an ordinary cucurbit or casing *a*, a hot-water bath or boiler *b*, a retort-head *c*, a neck *d d'*, and a refrigerator *e*. Between the casing *a* and the bath *b*, wherein the substances to be distilled are inserted, is a space *g*, having communication by means of a steam-inlet *f* at the bottom and a suitable connecting-pipe with a steam-generator of ordinary construction. The neck *d* is tapered, so as to have a contracted delivery into the refrigerator *e*, and is formed of two tubes, of which the one, *d'*, directly connected with the retort, terminates a short distance within the other, *d*, which is of larger diameter at the point of connection therewith and is directly in communication with the refrigerator or condensing apparatus. Within the part *d'* of the neck, where the two tubes are joined, is provided a hollow annular passage or conduit *h*, of small diameter, communicating by means of two or more pipes *i*, of suitable form and dimensions, with the before-mentioned steam-space *g*. The annular conduit *h* opens at one end into the neck and discharges superheated steam with considerable force through the neck *d* into the worm of the refrigerator *e*, carrying off by suction or exhaustion the vapors arising from the boiler or hot-water bath *b*, so as to create a partial vacuum therein. Through the head *c* of the retort another pipe *k* is passed vertically down to nearly the bottom of the bath *b* for the purpose of conducting steam into the latter through a perforated annular pipe or crown *n*, with which it is connected at its lower end by means of two or more branches *m*, as shown on Fig. 3. By this arrangement steam is forced through the perforations in the crown *n* into the mass of substances to be distilled contained in the bath *b*.

I may construct my retort either of stoneware, glass, tin, copper, or other suitable heat-resisting material.

In order to provide for the use of an electric current or of electrolysis within the retort for the purposes of hastening distillation and

preventing unpleasant fumes, I arrange upon the vertical pipe *k* and below the level to which the substances contained in the bath *b* may rise two metal disks or plates *o o'*, preferably of aluminium, perforated with small holes and separately supported and insulated by nuts *p p'* or equivalents, and washers *p²*, of asbestos, mica, or other suitable insulating material, interposed between the pipe *k* and the disks. (See Figs. 1 and 4.) The disks *o o'* are separately connected to opposite poles of a dynamo or of suitable batteries in the case of a very small retort by means of insulated conducting-wires *s s'*, inclosed within glass tubes *r r'*, which in turn are inserted within metal tubes *t t'*, as shown on Fig. 1. By this arrangement during distillation electrolysis is set up between the perforated disks *o o'* in the substances to be distilled by means of the rising steam. The steam as it rises through the mass is decomposed under the influence of the electric current and acts as a conductor for the current of electricity, thereby conveying the said current through the mass and permitting it to decompose certain materials to form oils.

At the bottom of the bath *b* I may provide a superheater for the steam employed in the retort. Should motive power be available for driving a large dynamo, I may, if desired, arrange an electrical superheater at the bottom of the bath. This electrical superheater, as shown on Figs. 1 and 5, may consist of a convolution or spiral of ferronickel wire, supported upon a metal disk or plate *u*, forming a double bottom to the boiler or bath *b*. Studs *x* and screws *z* are provided to secure the wire spiral or convolution in an insulated position, as shown on Figs. 1 and 6, small shields of asbestos, cardboard, and mica being preferably used as the insulating media. The conducting-wires are connected to the extremities *w* and *y* of the spiral (see dotted lines in Fig. 1) and are insulated and protected in the same manner as the conductors *s s'*, used for the purpose of electrolysis, as previously described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process of distilling fatty or resinous substances in liquid condition, which consists in passing through the said substances an electric current and simultaneously injecting into the same a current of steam, whereby the steam is decomposed by the electricity and acts as a conductor for the electricity through the mass, substantially as described.

2. In retorts for the distillation of fatty and resinous substances, horizontal insulated perforated metallic disks *o o'* adapted to be immersed within the substances to be distilled and separate insulated conductors *s s'*, connecting the disks to opposite poles of an external source of electricity, in combination with a steam-inlet to the lower part of the retort whereby the rising steam passes from

one metallic disk to the other, substantially as and for the purposes described.

3. In retorts for the distillation of fatty and resinous substances, the combination of a steam-inlet near the bottom of the retort, with a metallic plate or disk *u*, spiral or convolute conducting-wire, studs *x* and screws *z* for supporting the wire in an insulated position upon the said metallic plate or disk *u*, which is within and at the bottom of the retort, and connections between the plate and an external source of electricity, as and for the purposes specified.

4. In retorts for the distillation of fatty and resinous substances, the combination of the retort, and a steam-jacket *g*, with the neck *d* having an inner tube *d'* forming an annular passage *h*, and pipes *i* connecting the annular passage with the steam-jacket *g*, as and for the purposes specified.

5. In retorts for the distillation of fatty and resinous substances, the combination of a perforated annular pipe *n* adapted to be placed in the substances to be distilled and a steam-inlet pipe *k*, with horizontal insulated metallic disks above the pipe *n* and connected to opposite poles of a battery, substantially as and for the purposes described.

6. A retort for the distillation of fatty and resinous substances, consisting of an exterior casing *a*, bath *b*, head *c*, and neck *d*, separate insulated perforated disks *o, o'* immersed in the substances to be distilled and connected to opposite poles of an external source of electricity, an annular perforated steam-pipe *n* immersed in the substances to be distilled, an annular conduit *h* within the neck *d* and opening toward the exit thereof, and pipes *i*, connecting the annular conduit *h* with the casing *a*, in combination with a spiral or convolute wire and metallic supporting-plate *u* within and at the bottom of the retort for the purposes herein described.

7. A retort for the distillation of fatty and resinous substances, consisting of an exterior casing *a*, bath *b*, head *c*, and neck *d*, separate insulated perforated disks *o o'* immersed in the substances to be distilled and connected to opposite poles of an external source of electricity, an annular perforated steam-pipe *n* immersed in the substances to be distilled, an annular conduit *h* arranged within the neck *d* and opening toward the exit thereof, and a pipe *i*, connecting the conduit *h* with the casing *a*, substantially as and for the purposes described.

8. In retorts for the distillation of fatty and resinous substances, the combination of a steam-inlet, with horizontal disks adapted to be immersed within the substances to be distilled above the steam-inlet, each disk being connected to one of the poles of an electric battery, substantially as described.

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Witnesses:

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