

(No Model.)

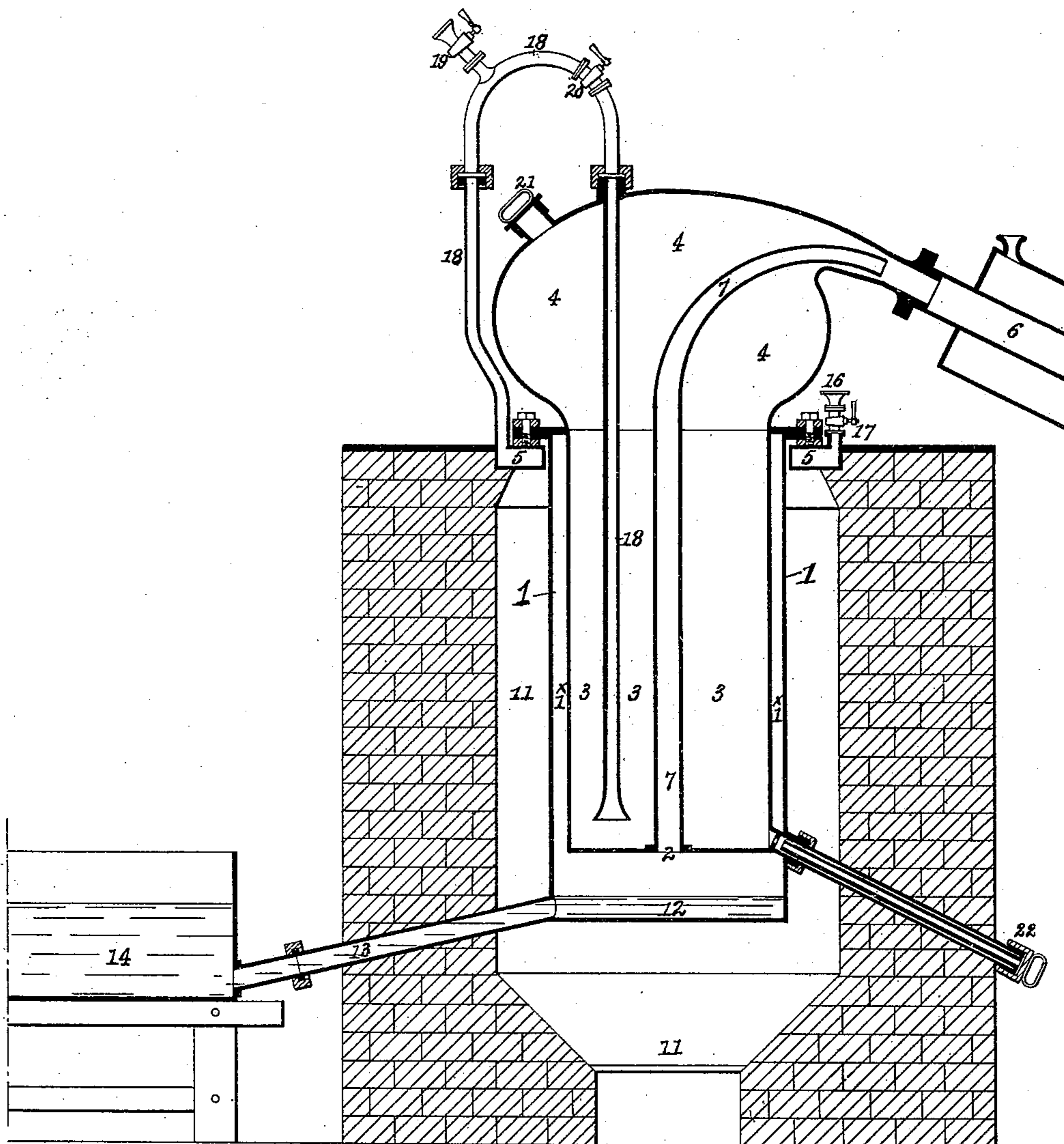
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V. J. KUESS.
ALEMBIC.

No. 488,766.

Patented Dec. 27, 1892.

FIG. 1.



WITNESSES:

George Baumann.
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(No Model.)

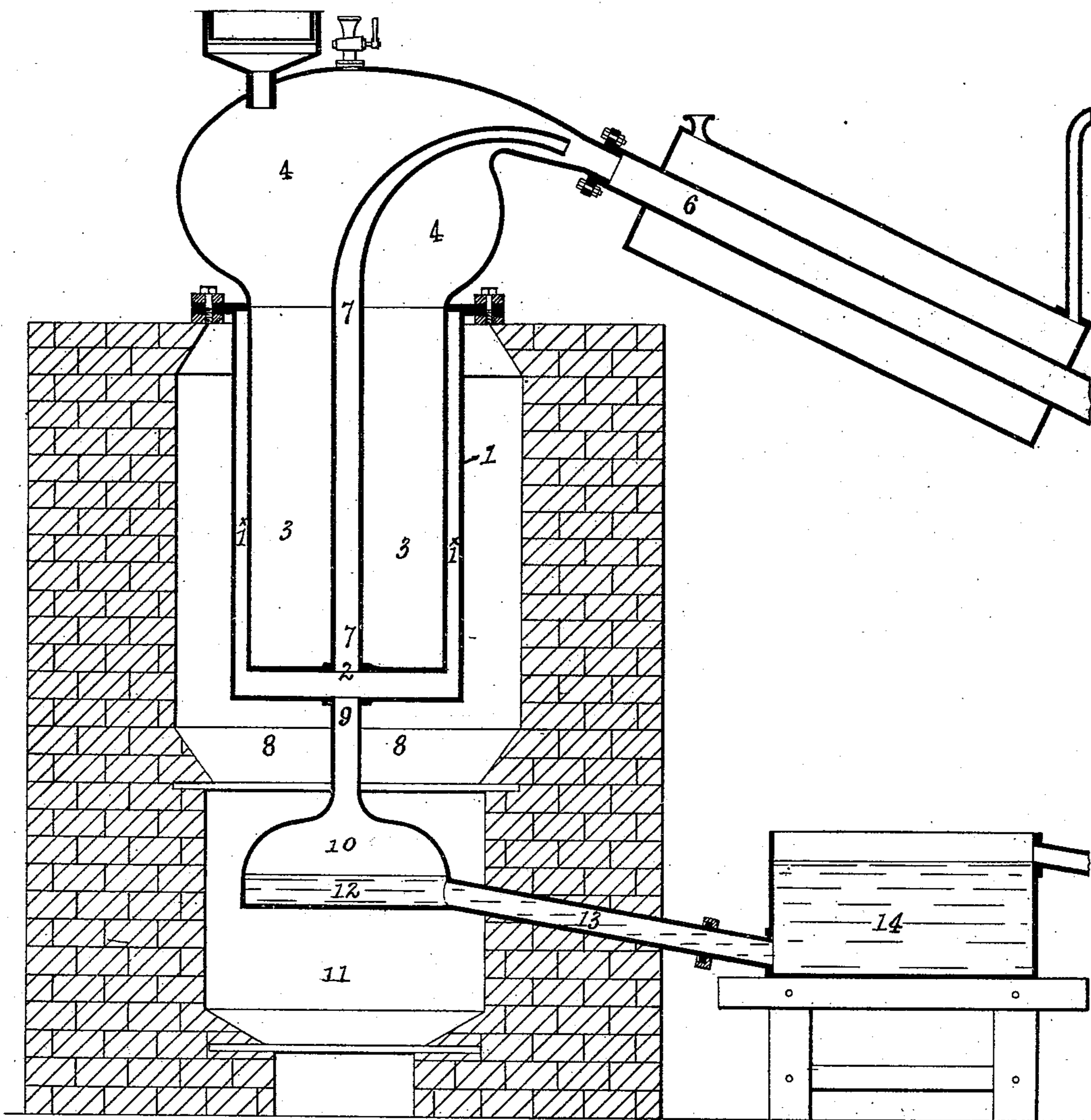
2 Sheets—Sheet 2.

V. J. KUESS.
ALEMBIC.

No. 488,766.

Patented Dec. 27, 1892.

FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

VICTOR JOSEPH KUESS, OF PARIS, ASSIGNOR TO CLEMENT HENRI JOSEPH DONNADIEU, OF BORDEAUX, FRANCE.

ALEMBIC.

SPECIFICATION forming part of Letters Patent No. 488,766, dated December 27, 1892.

Application filed September 21, 1892. Serial No. 446,466. (No model.) Patented in France February 7, 1891, No. 211,226.

To all whom it may concern:

Be it known that I, VICTOR JOSEPH KUESS, a citizen of the Republic of France, residing in Paris, France, have invented a certain new, useful, and Improved Alembic, (for which I have obtained a French patent, dated February 7, 1891, No. 211,226,) of which the following is a specification.

The alembic which is the object of the invention is applicable specially to the distillation of the essence of terebenthine (raw terebenthine), oil of resin (colophene), and in general of all resins and highly inflammable fatty matters (petroleum &c.), or those pyrogenous products which are formed by the contact between certain matters and a too violent dry heat, and which give to the products of distillation a disagreeable odor and a dark color, which odor, above all, renders the oil of resin unsalable. The ordinary water bath alembic does not give enough heat to distill colophene and other resins and to produce the oil or the essence. In the alembic constructed according to the present invention, all the advantages of the ordinary water bath alembic will be found, but in addition the heating power will be increased by the action of superheated steam, aided by a vacuum produced by a special arrangement of draw-off tube.

Now, in order that the nature of the invention may be readily understood, the apparatus is represented by way of example in the drawings annexed hereto.

Figure 1 is a vertical section of an alembic constructed according to this invention. Fig. 2 is a vertical section of an alembic of slightly modified construction.

The apparatus constituting the improved alembic consists of a body 3, which is placed in a vessel 1 containing the water bath. The body 3 and the water bath vessel 1 are both screwed or bolted directly to the head 4. This head is somewhat globular in form, with a rounded beak, as shown in the drawings, in place of having the form of a widened dome (cupola), like the head of ordinary alembics. Between the water bath vessel 1 and the body 3, there is an annular space 1*, of

which the size is variable according to requirements. By way of example, it may be said that the size or width of this space ought to be, by preference, ten centimeters for the distillation of the essence of terebenthine, and five centimeters for the distillation of oil of resin (colophene and other resin), whatever may be the size of the alembic. The distance which exists between the bottom of the water bath vessel 1 and the bottom of the body 3, is also variable; thus, it may vary from twenty to forty-five centimeters, according to the capacity of the alembic. The water bath vessel ought always to have a length or depth greater than its width. The water bath vessel 1 contains, at the bottom 12, the water to be converted into steam intended to effect the heating of the matters to be distilled, and the steam thus formed circulates in the annular space 1*. The matters to be distilled are introduced into the body 3 through the opening 21 in the head 4 of the alembic, in any convenient way.

22 is a discharge pipe for the residue of distillation from the alembic.

The body 3 has at bottom a circular opening 2, giving access to a pipe 7, which has a diameter variable at its base (by preference, of five to ten centimeters), according to the capacity of the alembic. This pipe is prolonged through the body 3, enters the head 4, and is turned over according to the curve of the beak of the head, so that it just enters the swan's neck 6. At the outlet, the pipe 7 has only half the diameter it had at its base. The beak of the head at the commencement of the swan's neck, should have, by preference, an interior diameter three times that of the exterior diameter of the pipe 7, in order to leave sufficient space around the pipe 7 to give a free course for the vapor of the matters being distilled.

The bottom of the water bath vessel 1 is provided with a pipe 13, which puts it in communication with a supply cistern 14. The level of the water in the cistern is ten or twenty centimeters above the level of the bottom of the vessel 1, and the cistern 14 may be supplied with running water, being pro-

vided with an overflow, the position of which is calculated so that the level of the water in the vessel 1 has always the height indicated.

The furnace chamber is constructed in such manner that the water bath vessel is surrounded by the furnace 11. The water in the bottom of the vessel 1 is converted into steam, which spreads into the space around the body 3, and escapes by the pipe 7 in the middle of the body 3. From the outlet of this pipe 7, the steam rushes with force into the swan's neck, and draws out the vapors arising from the matters being distilled, by forming a vacuum in the outlet. By this means, distilling with the improved alembic can be effected at a lower temperature than that hitherto necessary. The vapors of the matters to be distilled do not remain for any length of time in the head 4, but are withdrawn at once, and consequently those vapors are not acted upon by the heat, and the distillation takes place much more rapidly than heretofore. Moreover, in the swan's neck the steam is in contact and mixes with the vapors of the matters to be distilled. The steam draws out, envelops, rolls over, to speak, the vapors of the essences or oils &c., and cleans them and washes them during their passage through the coil. On arriving at the crow's beak, the essence or the oil, intimately mixed with water, falls into a receptacle, which, at its lower part, is provided with an emptying cock, and in its upper part with a beak. Once in this receptacle, the water, being the heavier, sinks to the bottom, drawing with it all the impurities, while the oil or essence rises to the surface.

In place of a single taper central pipe 7, several pipes may be adapted, which, join together at the commencement of the swan's neck, but it is preferable to have only one.

The object of the difference in diameter between the base and the outlet of the central pipe 7, is to give to steam greater pressure, and consequently to increase the force of the exhaustion, which becomes such (when the temperature is raised to a certain degree), that the entire mass to be distilled is raised and sucked out. For this reason, the amount of heat required is much less than in the ordinary alembics.

A further advantage, namely, that of being able to distill the matter to its last particle, is also obtained, and when the alembic is opened, there remains absolutely nothing at the bottom of the body 3. The faster the essence of terebenthine is distilled, the better is its residue, that is to say, the colophene is more transparent and less colored. For that reason it is desirable to heat the mass as rapidly as possible, to disengage the essential vapors. To this end, the alembics for distillation of the essence may be provided with a kind of heater 5, in the form of a hollow ring, into which water is introduced by a funnel 16, which is closed by a cock 17. This hollow

ring or boiler communicates with the interior of the body 3 by a removable pipe 18, which terminates in a rose. This pipe is provided with two cocks 19 and 20. The cock 20 serves to shut off the steam from the body 3, when the distillation of the essence is finished, and consequently to prevent the steam rendering the colophene opaque. The cock 19 provides means for the escape of the steam when the cock 20 is closed.

When it is a question of matters requiring a very great heat for their distillation, as for the transformation of colophene into oil, for example, then, in place of the water in the vessel 1, as described above, the water 12 may be put in a little boiler 10, which is in communication with the water bath vessel 1 by a pipe 9.

Water is introduced into the boiler 10 by the pipe 13 in the manner before described for the water at the bottom of the vessel 1. To produce the steam necessary for the distillation, the furnace 11 is arranged to heat the boiler 10. The steam thus formed escapes by the pipe 9 (which passes through the middle of the second furnace chamber 8) to the vessel 1. The steam, before expanding in the vessel 1, and before rising into the central pipe 7, is superheated to the highest degree possible by means of the heat in the second furnace chamber, which envelops the vessel 1 and surrounds the pipe 9.

What I claim is:—

1. The combination of a receptacle to contain the matters to be distilled, provided with a swan's neck outlet at the top and a steam vessel surrounding the receptacle, with a pipe communicating with the steam vessel passing through the said receptacle and having the end opening into the swan's neck, all substantially as and for the purposes set forth.

2. The combination of a receptacle to contain the matters to be distilled, the said receptacle having a head 4 with a swan's neck outlet, and a water vessel to supply steam to heat the said receptacle, with a pipe communicating at one end with the steam space, traversing the said receptacle, bent over in the said head 4 and entering the swan's neck, all substantially as and for the purposes set forth.

3. The combination of a receptacle to contain the matters to be distilled, provided with a swan's neck outlet at the top, and a water vessel to supply steam to heat the said receptacle, the said vessel communicating with a cistern to maintain the required level in the water vessel, with a pipe of decreasing diameter from the base to the top, passing through the said receptacle, the base communicating with the steam space and the top turned over and entering the swan's neck, all substantially as and for the purposes set forth.

4. The combination of a receptacle to contain the matters to be distilled provided with

5 a swan's neck outlet at the top, a water vessel to supply steam to heat the said receptacle, and a pipe leading from the steam space, through the said receptacle bent over the top and entering the swan's neck, with a boiler 5 and pipe 18 entering in the said receptacle, all substantially as and for the purposes set forth.

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

VICTOR JOSEPH KUESS.

Witnesses:

E. ST. FORT. TEHOR,
I. SAURAIKE.