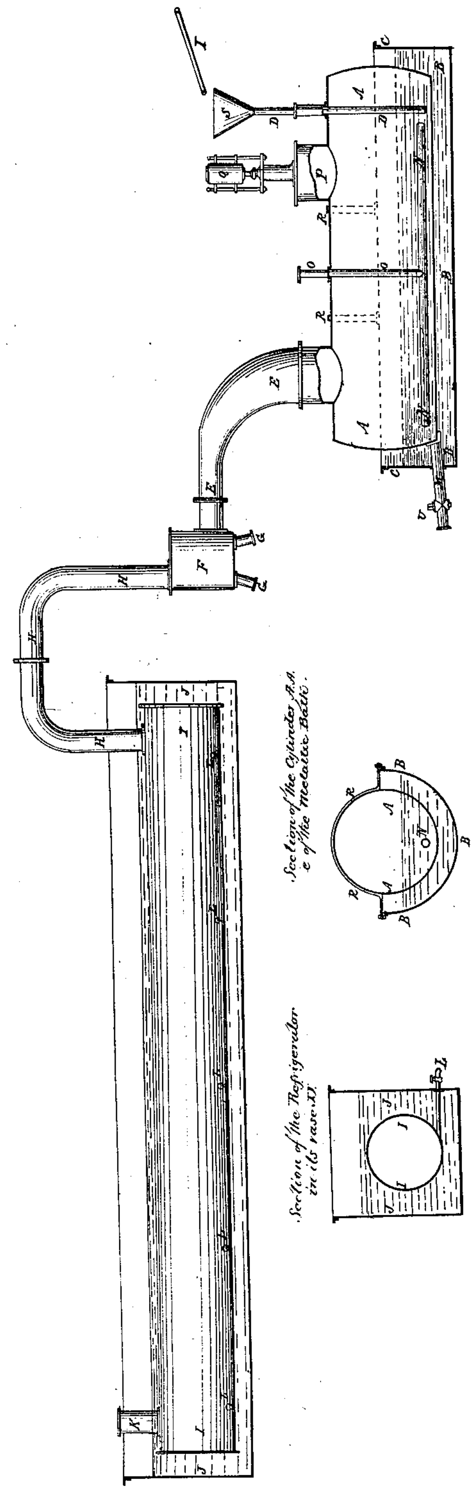
Poisat & Knab,

Oil Still,

No. 7,124. Patented Feb. 26, 1850.



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ANTHONY M. POISAT AND DAVID C. KNAB, OF PARIS, FRANCI

IMPROVEMENT IN DISTILLING OLEAGINOUS MATTER.

Specification forming part of Letters Patent No. 7,124, dated February 23, 1850.

To all whom it may concern:

Be it known that we, ANTHONY-MARIE POISAT and DAVID CLOVIS KNAB, of Paris, in the Republic of France, have invented an improved method of distilling fatty and oleaginous substances, such as fat, tallow, oil, lard, &c.; and I do hereby declare that the following is a full, clear, and exact description of the principle or character which distinguishes our invention from all other things before known, and of the method of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, which represent a longitudinal and cross section of the apparatus.

The same letters indicate like parts in all the figures.

The distillation of fatty and oleaginous substances has heretofore been attended with many practical difficulties. It has heretofore been conducted in large boilers containing, generally, from eight hundred to one thousand gallons, and they have been made large to avoid the waste of time and fuel consequent upon the frequent recharging of the apparatus, which, at every new charge, must be reheated. As heavy charges, such as those above indicated, require a long time to distil them, some portions of the charge are necessarily exposed for a long time to a high temperature, which has the effect to partly decompose fatty and oleaginous substances. If these substances are exposed to a temperature higher than is required for their distillation, the product will be vitiated, and as they do not from their very nature circulate freely if the boiler be unequally heated, portions will be overheated and injured, while others will not be sufficiently heated to be distilled. The more dense the fluid the more slowly will it give out its vapor, from the fact that the mass does not circulate so freely, and finally it is known that the presence of atmospheric air in the distillation of these substances is injurious.

With the view to avoid the defects in the modes heretofore practiced, our invention consists, first, in combining with a boiler for the distillation of fatty or oleaginous substances a self-feeding apparatus that the substances to be distilled may be continuously supplied as the distillation proceeds, to avoid the necessity either of repeated rechargings and the loss consequent thereon, or to avoid the exposure of the substances too long to the high temperature necessary to the distillation, which has the effect to partly decompose such substances; second, in the distillation of fatty or oleaginous substances in a boiler or boilers, the introduction of jets of steam at or near the bottom of the boiler to induce the circulation of the substances under treatment, and thereby to carry off more rapidly the volatilized parts, and at the same time to prevent the admission of atmospheric air to the substances under treatment, the introduction of such jets of steam being supposed to have a beneficial chemical effect, although we have not been able to determine this; and the last part of our invention consists in using, in combination with an apparatus for the distillation of fatty or oleaginous substances a lead bath at or near the melting point, interposed between the fire and boiler, to indicate the proper temperature for the distillation of such substances, and at the same time to diffuse and equalize the temperature and prevent any part from being more highly heated than others, and also to prevent any sudden and injurious transition of temperature.

The boiler A, which contains the substance to be distilled, is cylindrical (but may be of other form) and is immersed in a bath of melted lead or other metal or compound of metals which will melt at the same temperature as lead. The vessel B, which contains the metal bath, is to be placed over or in connection with a furnace of any desired construction. The lead bath should be of such depth as to rise above the level of the substances to be distilled in the boilers. The lead bath being a good conductor of caloric so soon as it is melted will heat all the parts of the boiler immersed in it to an equal degree, and as the heat of the fire has to be transmitted to the boiler through the metal bath any sudden transition of heat in the furnace will not seriously affect the boiler, and as the best temperature for the distillation of such substances is at the temperature of melting lead the attendant has always a sure indication of the temperature required.

The substance to be distilled is introduced into the boiler by a siphon or other tube, E; but if the substance be a concrete fat it should

be melted before it is supplied to the funnel of the feeding-tube E, and the said feeding-tube should be of sufficient height to supply the boiler by the pressure of the column. The boiler is also provided with a box, F, and pipe H, leading to a refrigerator or condenser, I J, of any desired construction, into which the products of the distillation pass. The substances condensed pass through the pipes L L into a reservoir, and the vapors that are not condensed escape through a chimney, K. The box F is provided with discharge-tubes G G, through which are discharged any impurities that may be carried up into the box. At one end, and as near the bottom as practicable, there is a discharge tube, M, provided with a stop-cock for the discharge of the residuum from the boiler. A pipe, N, connected with any appropriate steam-generator by a pipe, O, passes through and into the boiler, and runs along near the bottom thereof, and the said tube is perforated with numerous small holes for discharging steam in numerous small jets in and through the substance to be distilled. The steam, in passing up through the fatty or oleaginous substance, will carry with it the globules of the substance volatilized, will aid in diffusing the heat through the mass, and at the same time will produce a circulation of the substance to aid in liberating the volatilized matter. The steam, after passing through the substance, will pass with the volatilized matter into the refrigerator and be there condensed.

By means of the currents of steam and the lead bath we are enabled to distill fatty and oleaginous substances with great economy and at the lowest possible temperature, and hence to obtain the purest products. After the boiler has been charged it should be fed continuously to correspond with the distillation, and when the residuum has accumulated sufficiently, which will be after the boiler has received about equal to the charges, then the feeding is to be arrested until the whole charge has been distilled and the residuum discharged and cleaned out, which is done through a tube or man-hole P, of the usual construction.

We do not wish to be limited to the peculiar construction and arrangement of the apparatus hereinabove described, as the boiler may be variously constructed and still answer the same essential purpose. The substance to be distilled may be introduced and the residuum discharged in any other suitable manner essentially the same, and as to the introduction of steam any other mode of introducing it in numerous jets and near the bottom may be substituted for that above described, but we have described the construction and arrangement which we deem the best and have essayed with success.

We have discovered that the temperature at which such substances can be distilled with the greatest advantage to yield the best article is properly indicated by the temperature of lead at the melting-point—that is, when it changes from the solid to the liquid or from the liquid to the solid; and, as this change is very visible in lead, such a bath will always indicate to the attendant whether the temperature applied be too low or too high.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. Facilitating and improving the distillation of fatty and oleaginous substances by the introduction of steam at or near the bottom of the boiler containing such substance, substantially as herein described, in combination with the application of external heat, as described.

2. The process, substantially as described, of distilling fatty and oleaginous substances by means of a bath of melted lead or an alloy which will melt at the same temperature, substantially as and for the purpose described, whereby we are enabled to effect the distillation at the lowest possible temperature and have a practical indication of such temperature, as described.

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