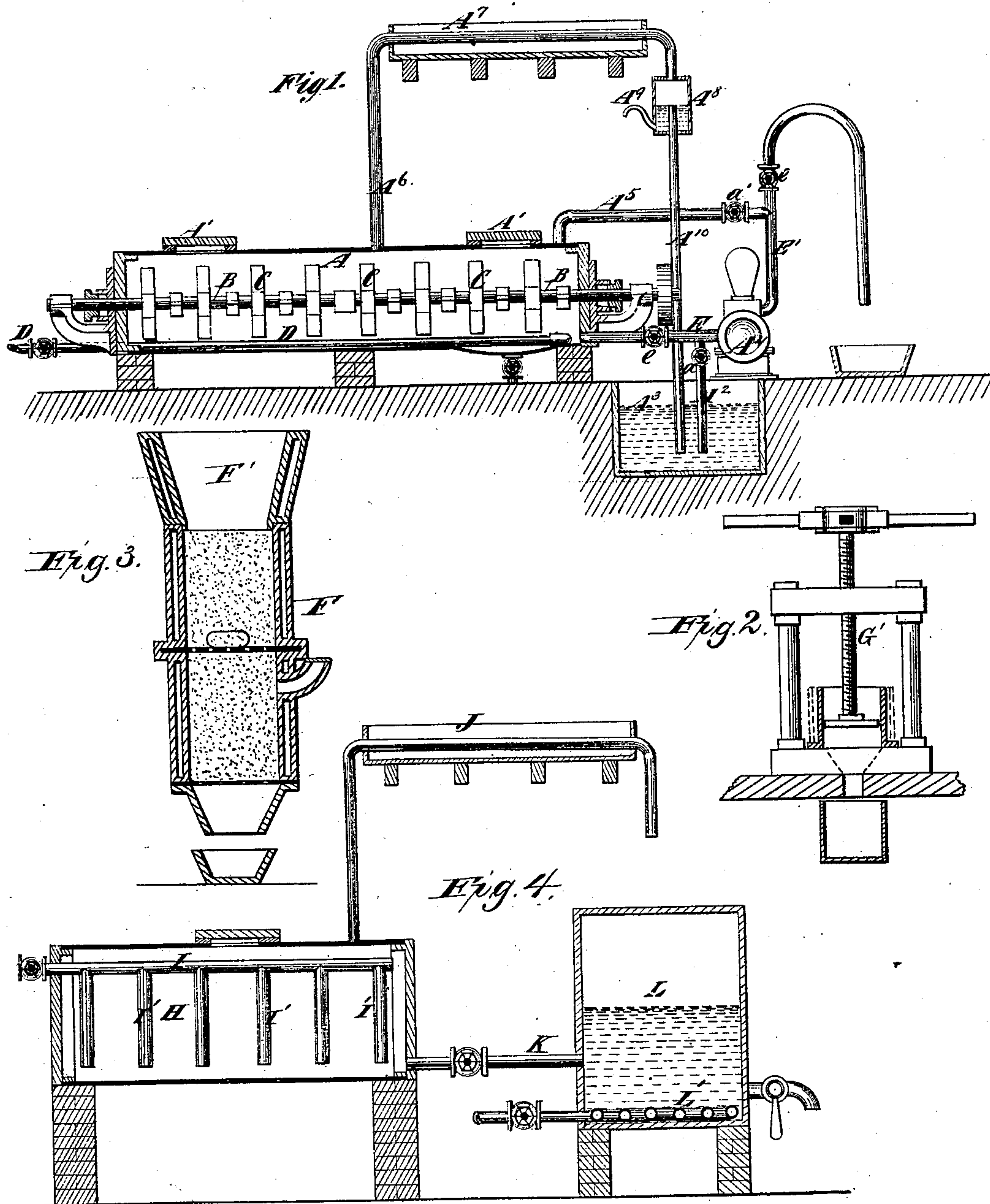


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Process of Refining Paraffine Wax.

**No. 235,057.**

**Patented Nov. 30, 1880.**



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# UNITED STATES PATENT OFFICE.

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## PROCESS OF REFINING PARAFFINE WAX.

SPECIFICATION forming part of Letters Patent No. 235,057, dated November 30, 1880.

Application filed February 26, 1880.

*To all whom it may concern:*

Be it known that we, WILLIAM BELL and WILLIAM M. SLOANE, both of the city of New York, in the county and State of New York, have invented a certain new and Improved Process of Purifying, Cleaning, and Refining Paraffine Wax, other Waxes, Rosins, Gums, and Fatty Matters, of which the following is a specification.

10 This improved process consists in thoroughly combining with the paraffine wax or other waxes, rosins, gums, or fatty matters to be purified, cleaned, and refined through heat and agitation, a proper quantity of any solvent, such as naphtha, spirits of turpentine, or ether, or the chemical equivalents thereof, then cooling the compound, and afterward, without other treatment, pressing the compound to expel the solvent, oil, and dirt therefrom. It is found that after combining such fatty matter with a solvent and cooling the compound a large amount of the dirt and foreign matter contained therein can, together with the oil and solvent, be separated through exudation by subjecting the cooled compound to pressure, and in many cases the compound is sufficiently cleaned or purified by such pressing, and the filtration thereof is rendered unnecessary. In some cases, however, further cleaning may be necessary, and in such instances the cooled and pressed compound may be washed by the action of steam in a closed vessel and afterward filtered, or first melted and filtered and afterward washed, to effect the more thorough cleaning and purifying. The cooled and pressed compound may, if desirable, be again subjected to the action of heat and agitation, and cooled and pressed a second time to effect the more thorough separation of the solvent, oil, and dirt, and after the said second pressing the compound may be filtered and washed. After being expressed from the compound the oil is preferably purified, to render it marketable, and the solvent may be purified by distillation, to render it fit for further use.

In the accompanying drawings, Figure 1 represents a partly longitudinal section and a partly side view of that portion of the apparatus wherein the wax or fatty matter is

combined. Fig. 2 represents a partly sectional side view of a press for pressing the combined and cooled compound. Fig. 3 represents a central vertical section of a filter for filtering the compound, and Fig. 4 represents a longitudinal section through that portion of the apparatus wherein the wax or fatty matter, after being pressed, is reheated, the solvent evaporated, and the wax or fatty matter washed.

Similar letters of reference designate corresponding parts in all the figures.

In carrying out the above-described process a given quantity of paraffine wax, or other wax, rosin, gum, or fatty matter—say, for example, one ton—is introduced into a cylinder, A, which is provided with an agitator consisting of a rotary shaft, B, carrying a number of radial arms or blades, C, and a suitable quantity of naphtha, preferably petroleum-naphtha or other solvent, such as spirits of turpentine, ether, or their chemical equivalent—say, for example, a quantity equaling twice in volume the volume of the wax or fatty matter in the cylinder. The fatty matter and the solvent are mixed by the agitator and heated by means of a steam pipe or coil, D, which extends into the cylinder A, until they are thoroughly liquefied and combined.

The proper quantity of solvent to be employed will vary slightly with the character of the wax or fatty matter with which it is to be combined, the object being always to employ such proportion that the compound will congeal in cooling, and no more.

The wax or fatty matter may be introduced through man-holes A', and the naphtha through a pipe, A<sup>2</sup>, from an underground tank, A<sup>3</sup>, to a pump, A<sup>4</sup>, and thence through the pipes E' and A<sup>5</sup> to the cylinder, suitable valves, a and a', in the pipes A<sup>2</sup> and A<sup>5</sup> being employed to control the flow through these pipes. Such of the solvent as is evaporated in the cylinder A is carried off by a pipe, A<sup>6</sup>, to a condenser-coil, A<sup>7</sup>, and thence to a separator consisting of a chamber, A<sup>8</sup>, provided with a siphon, A<sup>9</sup>, for carrying off the condensed water formed by the condensation of the steam, and a pipe, A<sup>10</sup>, for conducting the solvent back to the tank A<sup>3</sup>.



At the proper time the compound may be drawn off from the cylinder A by the pump A' through a pipe, E, and thence forced through the outlet-pipe E', from which it is drawn into  
5 any receptacle, the valves *a* and *a'* being closed meanwhile. The pipes E and E' are provided with valves *e* *e'* to control their use.

When the compound is cooled to a point of complete congelation, and without other treat-  
10 ment, it is, in bags or otherwise, subjected to the action of a press, G', Fig. 2, and the oil and naphtha or other solvent expressed from it. The greater proportion of the dirt or other foreign substances and coloring-matter con-  
15 tained in the compound is separated, together with the oil and solvent, through exudation, by the operation of pressing, and it is for this reason that with many substances any further treatment of the wax or other fatty matters is  
20 rendered unnecessary, it being purified and cleaned sufficiently to render it marketable by the simple operation of pressing the congealed compound. The article to be purified is then passed through a filter, F, to still further sep-  
25 arate the dirt or other impurities.

As here represented, the filter is surmounted by a vessel or tank, F', which is steam-jacketed, and in which the wax or fatty matter may be heated and kept in a limpid state before fil-  
30 tering. The filter also is steam-jacketed, so as to keep the wax or fatty matter hot while passing through it. The oil and naphtha or other solvent, after being expressed, is subjected to the application of heat and the naphtha driven  
35 off by evaporation, leaving the oil in a marketable condition. After passing through the filter the wax or fatty matter is introduced into a cylinder, H, Fig. 3, into which steam is injected through a main pipe, I, and branch  
40 pipes I', the whole being heated, and any naphtha remaining is evaporated and driven off and condensed in a condenser, J, and separated as from the cylinder A. The wax or fatty matter after being thus washed is run  
45 off through a pipe, K, into a settling-tank, L, heated by a steam-coil, L', so that any water

it may hold in suspension may be separated by specific gravity, after which the wax or fatty matter may be run off into molds, and will then be ready for market. 50

If desirable, the operations of filtering and washing the wax or fatty matter, which are performed subsequently to the operation of pressing, may be reversed, and the washing be performed before the wax or fatty matter is  
55 filtered.

We are aware that prior to our invention a solution of paraffine wax or other waxes, fatty matters, rosins, or gums with naphtha, spirits of turpentine, or equivalent solvent, has been  
60 effected through heat and agitation, and that the solution in a heated state, and before being allowed to cool, was filtered and, after being cooled, subjected to pressure. This differs  
65 from our invention in that we allow the solution to cool immediately after being made, and when cool subject it to pressure without previously filtering it. By thus subjecting it to pressure before filtering it much of the solvent oil and extraneous matter is eliminated before  
70 the filtering, and the filter is saved from much of the work it would otherwise have to do, and hence remains in a working condition for a longer time without attention. Moreover, the filter is thus adapted the better for eliminat-  
75 ing the finer particles of extraneous matter.

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

The process of purifying, cleaning, and refining paraffine wax, other waxes, fatty mat-  
80 ters, rosins, and gums, consisting in forming a solution thereof, with naphtha or other solvent, through heat and agitation, subsequently cooling and congealing the same, next subjecting the same to pressure and then filtering, keep-  
85 ing the mass heated during the filtering, substantially as specified.

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