2 Sheets—Sheet 1.

A. DUNN.

Rendering Apparatus.

No. 3,844. Patented Dec. 4, 1844.

Fig. 1.

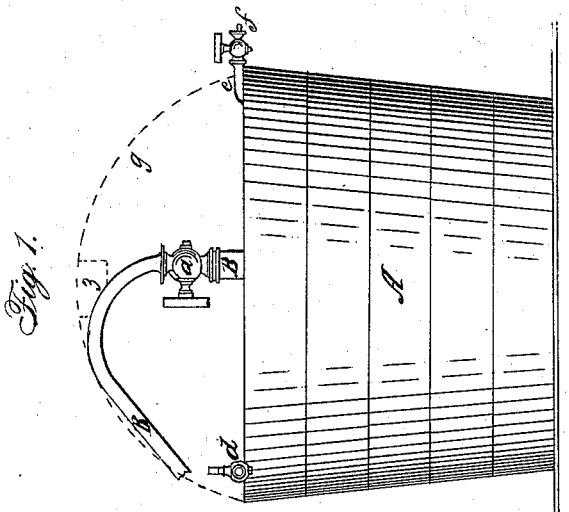


Fig. 7.

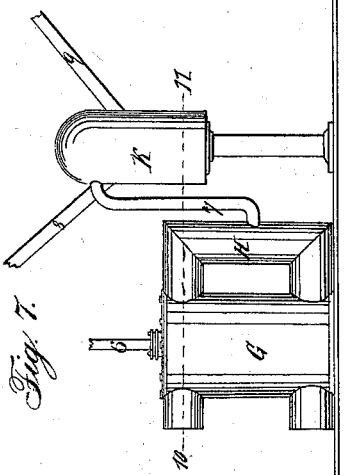
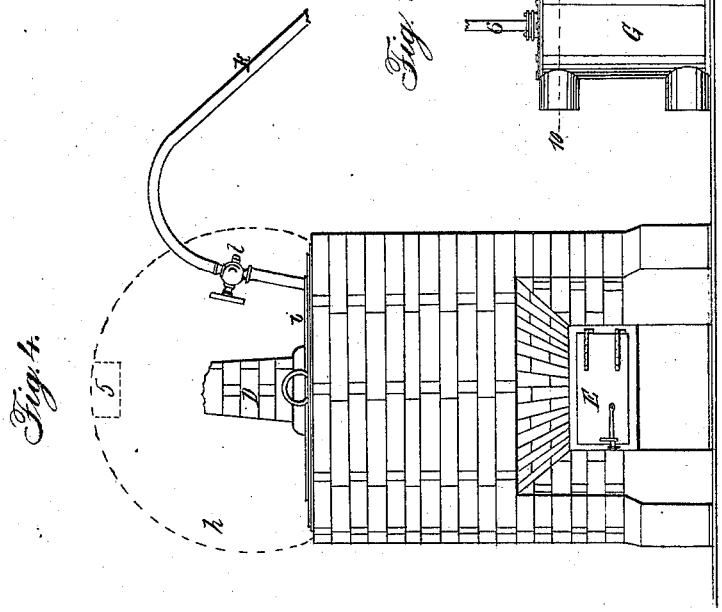


Fig. 4.

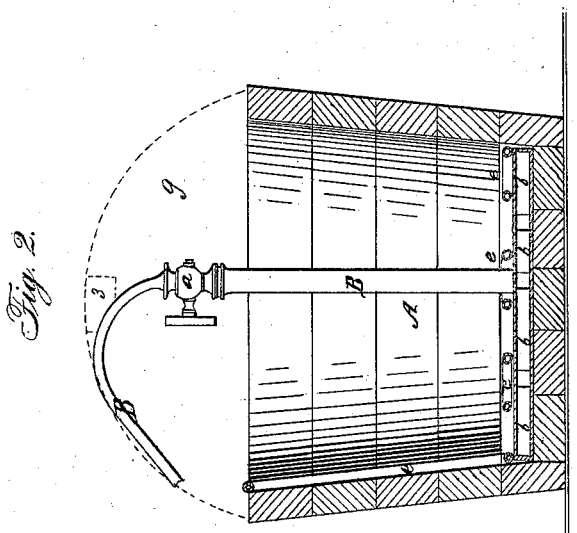


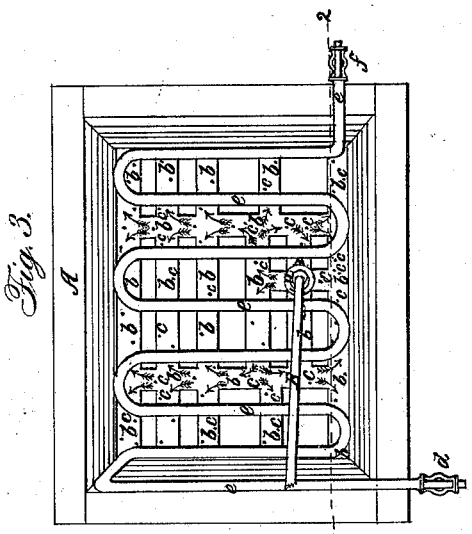
2 Sheets—Sheet 2.

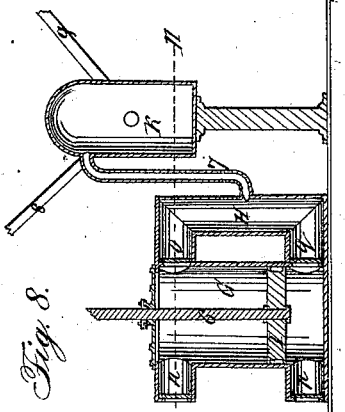
A. DUNN.

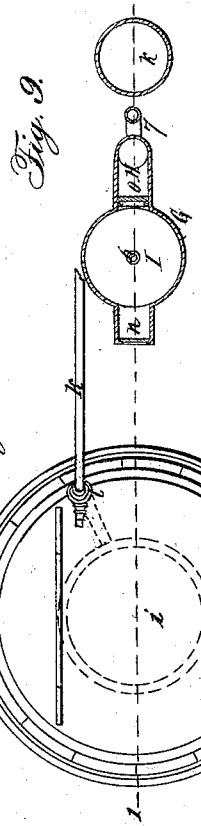
Rendering Apparatus.

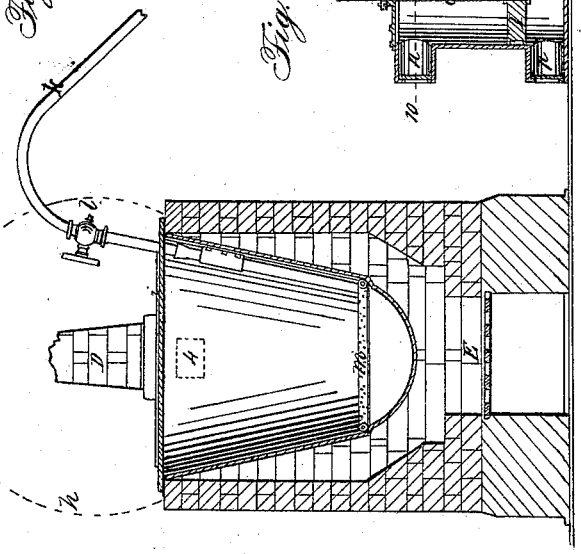
No. 3,844. Patented Dec 4, 1844.

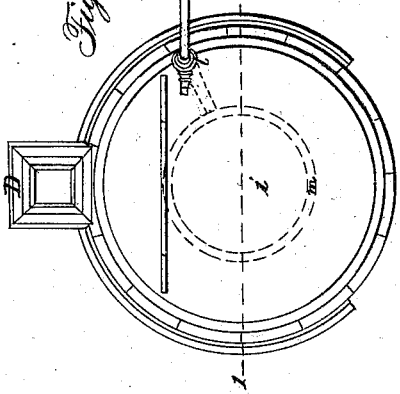












UNITED STATES PATENT OFFICE.

ARTHUR DUNN, OF ROTHERHITHE, ENGLAND.

PURIFYING SOAP AND OILS.

Specification of Letters Patent No. 3,844, dated December 4, 1844.

To all whom it may concern:

Be it known that I, ARTHUR DUNN, a subject of the Queen of Great Britain, and now residing at Rotherhithe, in the county of Surrey, England, soap-boiler, have invented or discovered new and useful Improvements in Treating, Purifying, and Bleaching Oils and Fatty Matters and in Making Soap; and I, the said ARTHUR DUNN, do hereby declare the nature of the invention and the manner in which the same is to be performed are fully described and ascertained in and by the following statement thereof—that is to say, my invention consists, first, in causing oils and fatty matters to be subjected to streams of atmospheric air forced below the surface thereof, so that the air rising to the surface of the oils or fatty matters will agitate the same and carry off impure odors and bleach or purify the oils or fatty matters under process. For these purposes I use the apparatus exhibited in the annexed drawings, wherein—

Figure 1, shows a vat, in place for use. Fig. 2, is a section of the same, at the line 1, 2, Figs. 3, 6, and 9. Fig. 3, is a plan of the parts I use, and recommend for this purpose, as hereafter described.

Secondly my invention consists in causing oils and fatty matters together with materials for saponifying such oils and fatty matters to be subjected to streams of air forced below the surface of such materials thus facilitating the manufacture of soap. For this purpose Fig. 4 of the drawing shows a soap hopper, in place for use. Fig. 5, is a section of the same, at the line 1, 2, Figs. 3, 6, and 9. Fig. 6, is a plan, these several figures collectively show the means I use and recommend, and the like letters and numbers, as marks of reference, apply to the like parts, in all the several figures herein referred to.

In carrying out the first part of my invention I cause the fatty matters or oil which it is desired to treat, bleach and purify, to be kept heated by steam pipes as shown at *e*, Figs. 1, 2, and 3 with an induction cock *d*, and eduction cock *f*, or other means to maintain a heat of from 170° to 230° of Fahrenheit when in any convenient vessel as in the vat A, Figs. 1, 2 and 3, over which I prefer there should be placed a hood as shown by dotted lines at *g*, Figs. 1, and 2, with an opening into a chimney as at 3, Figs. 1, and 2, so as to conduct off any vapors which may arise into the outer atmosphere and by means of perforated pipes or perforated shallow vessels as at *b*, *b*, Figs. 2, and 3, which shows square pipes, for the air to travel at the bottom of the vessel A, in the direction of the arrows, and rise up, through small holes *c*, *c*, in the pipes placed at the bottom of the vessel. I cause numerous streams of air to be forced through the oil or fatty matters by forcing air by any convenient blowing apparatus into the standpipe B, which, with its regulating or stop cock *d*, leads into the perforated pipes or vessels or the air may be forced into and below the fatty matters or oil by numerous small tubes descending from one or more main tubes above the oil or fatty matter in the vessel such main pipe or pipes being in connection with the blowing machinery or apparatus used and it should be understood that the object being to obtain numerous small streams of air to rise up through the fatty matters or oil under process.

I do not confine myself to any particular construction of apparatus for obtaining streams of air, although I have shown in Fig. 7, of the drawing, a double acting air pump, in place for use, with a section Fig. 8, as at the line 1, 2 Figs. 3, 6, and 9, and a plan Fig. 9, as at the line 10, 11 see Fig. 8, with an air cylinder G, air passages H, piston I, and rod *b*, to attach to any convenient motive power the air pipe 7, leading to the reservoir K, with branch pipes 8 and 9 to the soap copper and oil vat, the induction valves *n*, and *p*, opening and shutting, on the corresponding motions of the piston I, the leading valves *o*, and *q*, retaining the air forced into the reservoir K, and thence passing it through the matters under treatment; but any fit mechanical means may be used, for forcing in the required streams of air and I employ air at atmospheric temperature not having found that the heating of the air used before it is forced below or through the fatty matters or oils produces more beneficial results than air not heated the time of operating on different oils and fatty matters will be found to vary and such is the case with respect to similar descriptions of oils and fatty matters but as the result of the process of treating oils and fatty matters by air is progressive and the extent of effect or result produced

readily judged of from time to time the workman will judge from samples taken out of the vessel whether the oil or fatty matters are purified and bleached to the degree desired and if not be will continue the process of forcing air through the same till the desired result is obtained thus in treating various qualities of different samples of palm oil I have found that the same have taken from eight to fifteen hours to render them very free from color and when treating different qualities of tallow I have found that the impurities of smell have been very quickly got rid of and the same have been well bleached in from eighteen to twenty four hours and in less time if the extent of purifying and bleaching required be less and as before stated the time required for the process will vary according to the extent of bleaching required and according to the quantity of color and impurities contained in particular oils and fatty matters of the same descriptions. I have mentioned palm oil and tallow because I believe them to be those most requiring to be treated according to my invention at the same time the information here given will be sufficient for the workman when acting on other oils or fatty matters and I have found that the process is quickened in some degree by the higher degrees of temperature up to the highest temperature above mentioned but I consider it desirable so far as my experience has gone not to use higher temperatures than those mentioned as fatty and oily matters may be injured by high temperatures and when time is not an object I believe it better not to exceed a temperature of 200° of Fahrenheit but I do not confine myself to any particular degrees of heat when treating fatty matters and oils with streams of air but I have above given the best information I possess for the carrying out this part of my invention.

I would remark that the treating of oils and fatty matters with streams of air forced through or among the same owing to the agitating effect produced will be found useful when mixing fatty matters and oils with other matters as the same will be very readily and intimately mixed.

The second part of my invention consists in passing or forcing currents of atmospheric air by means of any convenient apparatus through the materials required to be saponified such materials being placed in any suitable vessel to which heat can be applied I employ the apparatus shown in Figs. 4, 5, and 6, with the chimney D, furnace E, flue 4, hood *h*, vapor flue 5, and cover *i*, these figures show, collectively and in place for use, the ordinary soap coppers used by soap boilers. I fix in each copper a circular ring of pipe as at *m*, Figs. 5 and 6, of about an inch and a half bore perforated with small holes in the well of the copper just below the flange or joint keeping it sufficiently off the bottom as shown in Fig. 5 to allow a stirrer to be used to scrape the bottom of the copper when necessary. The circular ring of pipe is connected to a pipe with a socket joint as at *x*, to remove for opening the cover *i*, and rising to the top of the copper and above the lid *i*, where it is furnished with a stop cock and union joint as at *l*, and connected by a pipe *k*, with a cylinder blast shown in Figs. 7, 8, and 9, or any other convenient machine or apparatus may be used for forcing or obtaining streams of air through the matters under process. For a clean copper-yellow soap I first put into the copper (which I will suppose capable of working 106 cwt. of material) three hundred and sixty gallons of lyes specific gravity 1.14 made from good soda ash of about forty to forty-six per cent. I then light the fire and charge the copper with the grease or oil or fatty matter in the usual way say eighty three hundred weights of grease and as soon as the lye is hot and on the boil or nearly to the boil I set the blast in action keeping up a good brisk fire so as to keep the materials in the copper as near the boil as possible when the strength is taken up from the lyes as is well understood. I gradually add more lyes until the grease oil or fatty matter is killed which is also well understood. I then add twenty three hundred weight of resin by a few hundred weight at a time with more lye from time to time until I have used one thousand two hundred gallons of lyes (of the strength above mentioned) or thereabouts keeping the blast in action the whole time if the fire draws well but if not it is desirable to stop the blast for a short time before adding the resin to allow the contents of the copper to approach to the boil. When the whole of the resin is melted and completely mixed with the soapy mass and the strength of the lyes taken up I stop the blast and give the contents of the copper a brisk boil up. I then allow it to stand for the spent lyes to settle and pump them off and finish or bring the soap up to strength, on fresh lyes as in the ordinary process of soap boiling.

I would here remark that during the operation of the blast I have found it desirable that the soap should be kept in what is technically called an open or grained state and for this purpose salt or brine is to be added when necessary and I find it better not to make a change of the lye during the operation of the blast where lye of the strength before mentioned is used but if weaker lye is used one or more changes may be made as is well understood and it is found desirable that the soap should be kept in what is called a weak state during the action of the streams of air through the materials other-

wise the soap is apt to swell up from the air hanging in the grain and this is found troublesome to get rid of and requires long boiling to do so. If dark colored goods are used it is well to keep the blast in operation three or four hours after the resin is melted provided the soapy mass is kept weak and open or grained. When a charge is to be worked upon a nigre I grain such nigre and pump off the spent lye in the ordinary way and then add the fresh charge in the manner before mentioned using less lye in proportion to the quantity and strength of the nigre taking care not to turn on the blast until there is sufficient grease present to make the nigre weak. Other qualities and descriptions of soap may be made in the manner hereinbefore mentioned by forcing streams of air through the matters under process of saponification varying the materials according to the quality and description of soap required to be manufactured.

Having thus described the nature of my invention and the best means I am acquainted with for performing the same I would wish it to be understood that I do not claim the apparatus herein described and shown in the annexed drawings for forcing streams of air into and through oils and fatty matters whether for purifying bleaching or saponifying them as any suitable apparatus may be employed for that purpose. But

What I claim is—

1. The mode of treating purifying and bleaching oils and fatty matters by causing streams of air to be forced or passed into or through them as herein described.

2. And secondly I claim the mode of manufacturing soap by causing streams of air to be passed through and among oils and fatty matters when combined or together with suitable saponifying materials.

ARTHUR DUNN.

Witnesses:
JNO. ALCOCK,
THOS. BROWN.