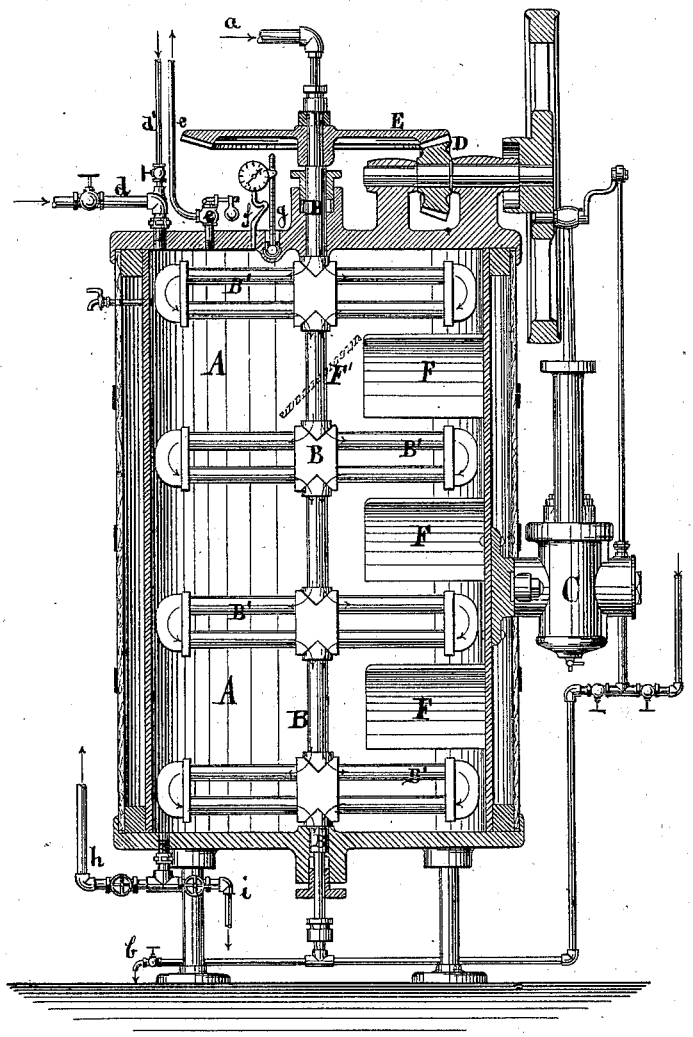
F. SAHLFELD.

Apparatus for Obtaining Glycerine from Fats.

No. 201,704. Patented March 26, 1878.



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IMPROVEMENT IN APPARATUS FOR OBTAINING GLYCERINE FROM FATS.

Specification forming part of Letters Patent No. **201,704**, dated March 26, 1878; application filed February 11, 1878.

To all whom it may concern:

Be it known that I, FREDERICK SAHLFELD, of the city, county, and State of New York, have invented a new and Improved Apparatus for Extracting Glycerine from Fats, of which the following is a specification:

This apparatus is based on the same general principles which have hitherto been followed in the manufacture of glycerine from fatty matter—viz., on the employment of a certain temperature and pressure during the circulation or mixing of the materials. This has, in most cases, been accomplished by the direct action of steam and the distilling of glycerine from fats.

My invention also employs steam for the purpose of mixing the fatty matter and chemicals; but not by direct action on the same, but indirectly, by the use of revolving steam-heated stirrers, the mechanical action and the contact of the surfaces of the stirrers with the fatty material expediting the separation of the glycerine, so as to save considerable time and expense.

The invention consists, more especially, in the arrangement of revolving steam-heated stirrer-arms within a jacketed vessel having inclined or slanting plates, over which the fatty matter is carried by the revolving stirrers.

The accompanying drawing represents a vertical central section of my improved apparatus for extracting glycerine from fats.

A represents a cylindrical vessel, which is covered by a jacket filled with non-conducting materials, and incased with wood. At the center of the vessel A is supported, in bearings of the top and bottom plates, a vertical hollow shaft, B, to which are coupled, at suitable distances from each other, horizontal U-shaped stirrers B′, which are made of pipes, so that steam, supplied by a top pipe, *a*, to the hollow center shaft, passes successively through all the stirrer-arms, leaving the shaft finally through a fixed bottom exit-pipe, *b*.

The top supply and exit pipes *a* and *b* are fitted, by suitable stuffing-boxes, to the revolving shaft B. The lower end or exit pipe *b* conducts the condensed water and waste-steam to the outside. The waste-steam may, however, be further utilized in a steam-cylinder, C, that is arranged at the side of the vessel A, for the purpose of driving the central shaft B, by means of an intermediate shaft with fly-wheel connected with the piston-rod of the cylinder, and by the bevel-gear wheel transmissions D and E, of which the latter bevel-wheel, E, is keyed to the hollow central shaft B.

When several apparatus are worked together, the center shafts may be revolved in connection with a suitable power-transmitting shaft, and in this case the arrangement of a separate steam-cylinder and transmitting-gearing for each apparatus may be dispensed with.

The waste-steam that is passed through the apparatus may also be applied for any other purpose that requires steam of less temperature and pressure than that required for heating the stirrer system.

At the interior of the cylindrical vessel A are arranged inclined or slanting plates F, of which one is shown in dotted lines at F′, so as to more clearly indicate the inclined position of these plates. The object of these plates F is to effect the thorough circulation and mixing of the fatty materials during the time they are revolved by the stirrers, the mass being forced over the plates, which, in connection with the centrifugal force imparted by the stirrers, produces an upward motion along the plates, and a return downward motion along the center shaft.

The apparatus is provided with a pipe-connection, *d*, for the purpose of charging the vessel A with the materials to be extracted; also with a pipe, *d′*, for the admission of live steam.

A safety-valve, *e*, a pressure-gage, *f*, and a thermometer, *g*, serve to regulate and indicate the pressure and temperature at the interior of the apparatus. At the bottom of the apparatus are pipes *h* and *i*, with stop-cocks, through which the parts are drawn off, when the separation of the glycerine from the fatty matter is accomplished.

For the purpose of expediting the separation of the glycerine, the fatty matter is mixed with lime and caustic soda, in the proportion of one hundred parts of fat to two and one-half parts of lime and one-half part of soda. This ac-

complishes the formation of soda-soap, which, by the influence of the lime, accelerates the formation of glycerine. When, by continued stirring of the mass for a certain time, the parts are thoroughly mixed, a gradual increasing pressure is obtained in the vessel, which, jointly with the heat of the stirrer-arms, produces the separation of the glycerine, which is forced out with the aqueous liquor through the bottom pipe *i* by the admission of live steam through the pipe *d'* at the top. The remaining fatty materials are finally removed from the vessel through the bottom pipe *h* by a suitable steam-pressure. The glycerine is then purified and separated from the water in the customary manner, the extraction of glycerine by this apparatus being accomplished in a quicker and superior manner, and at a considerable saving of time, on account of the more thorough intermixing and stirring of the fats, and of the higher temperature and pressure obtained in the apparatus.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a vertical jacketed cylinder having inclined plates F, of the vertical hollow shaft B, the horizontal tubular stirrers B', and the steam-pipes *a b*, all arranged substantially as shown and described.

2. The combination, with vessel A, having hollow shaft B with exit-pipe *b*, of the steam-cylinder C, connected with said pipe and hollow shaft by intermediate mechanism, substantially as shown and described.

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