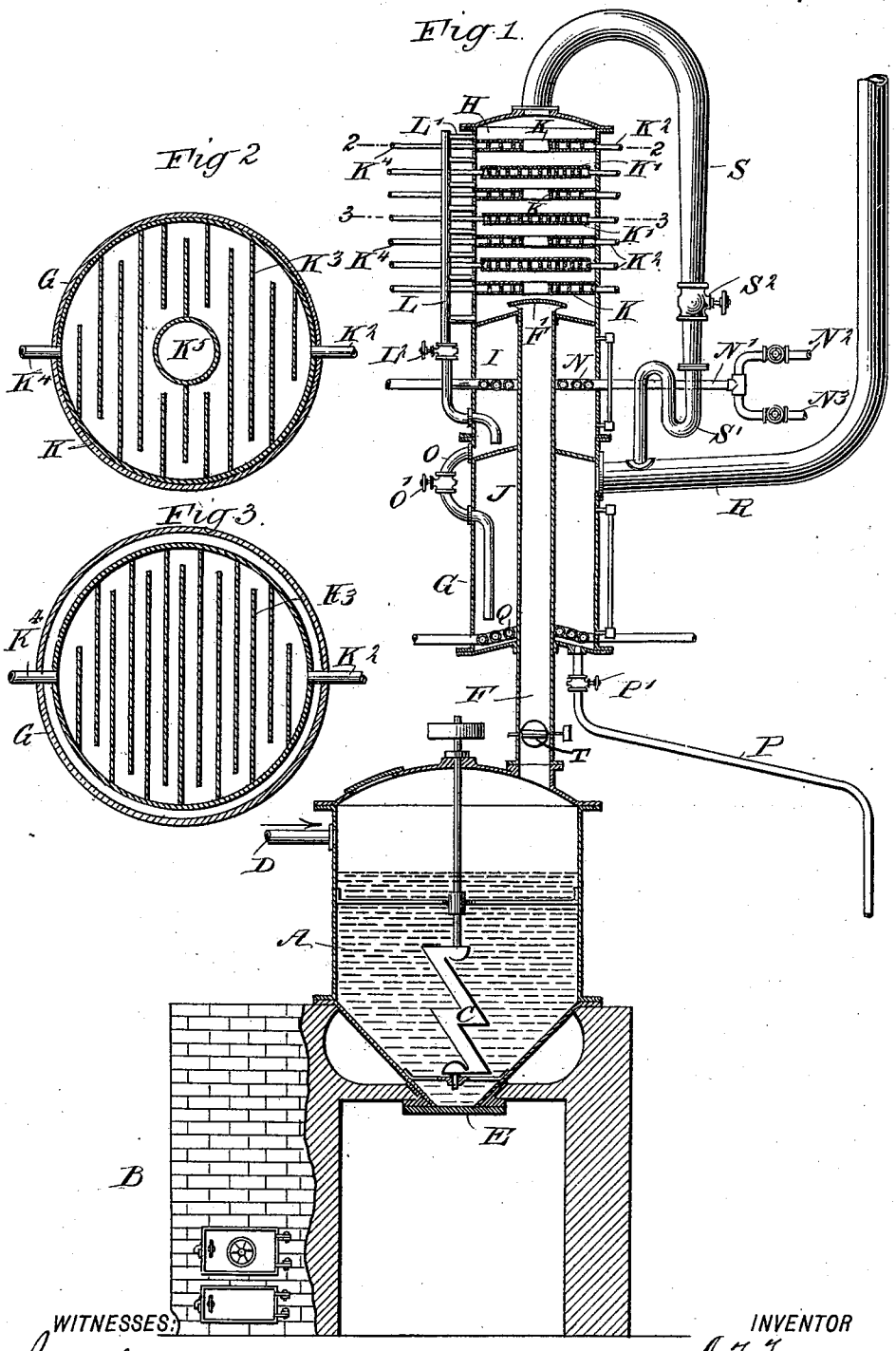
(No Model.)

A. F. TRAGESER.

APPARATUS FOR DISTILLING AND CONCENTRATING GLYCERINE AND HEAVY OILS.

No. 510,734. Patented Dec. 12, 1893.

Fig. 1.



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APPARATUS FOR DISTILLING AND CONCENTRATING GLYCERINE AND HEAVY OILS.

SPECIFICATION forming part of Letters Patent No. 510,734, dated December 12, 1893.

Application filed September 25, 1893. Serial No. 486,469. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. TRAGESER, of the city, county, and State of New York, have invented a new and Improved Apparatus for Distilling and Concentrating Glycerine and Heavy Oils, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved apparatus for distilling and concentrating glycerine and heavy oils, and which is simple and durable in construction, very effective in operation, takes up little space and requires no costly separate vacuum pan for concentrating purposes, thus cheapening the cost of the apparatus to such an extent as to be within means of smaller manufacturing establishments to permit soap makers, for instance, to make glycerine from their own soap lyes.

The invention consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is an enlarged sectional plan view of the condenser, on the line 2—2 in Fig. 1; and Fig. 3 is a similar view of the same on the line 3—3 of Fig. 1.

The improved apparatus is provided with the ordinary steel still A, set in a furnace B of any approved construction, and provided with an agitator C driven by suitable means to agitate the liquid contained in the still and fed therein through a pipe D from a suitable source of supply.

On the lower end of the still A is arranged the usual removable head E for cleaning the still whenever necessary.

From the upper end of the still A leads a pipe F to convey the vapors arising in the still A to a condenser H, formed in the upper end of a shell G containing below the condenser a receiver I and below the latter an evaporator J. The pipe F extends through the evaporator J and the receiver I, and discharges into the lower end of the condenser H, the said pipe being provided at its upper end with a dash plate F′ to cause the vapors to be distributed in the lower end of the condenser. Within the latter are arranged water cooling sections K, K′ each provided with a water inlet pipe K^2 and each formed with transversely-extending alternating partitions K^3 so as to cause the water to circulate through each section before passing to the outlet pipe K^4 which, like the inlet pipe K^2 extends through the shell G. The sections K are formed with a central aperture K^5 for the passage of the rising vapors, while the sections K′ are somewhat less in diameter than the interior diameter of the evaporator H, so as to permit the vapors to pass upward through the space formed between the outer edge of the section K′ and the shell. The sections K and K′ are placed suitable distances apart and from the space between the sections lead branch pipes L′ connected with a pipe L disposed vertically and discharging at its lower end into the bottom of the receiver I. The pipe L is provided with a valve L^2 for controlling the flow of the fluid from the condenser to the receiver I. In the latter is arranged a coil of pipe N having its inlet end N′ connected with two valved pipes N^2 and N^3 of which the one is connected with a steam supply, and the other with a cold water supply, so as to permit the operator to force cold or warm water or steam, through the coil of pipe N to heat or cool the material contained in the receiver I. The lower end of the latter is connected by a pipe O with the lower end of the evaporator J, and the said pipe O is provided with a valve O′ to control the flow of the glycerine from the receiver I to the evaporator J. From the bottom of the latter leads a valved pipe P for withdrawing the finished product, and in the bottom of the evaporator is arranged a steam coil Q for evaporating the material. From the upper end of this evaporator J leads a flue R for carrying off the vapors, and into this pipe leads the outlet pipe S extending from the upper end of the condenser H. The pipe S is provided near its entrance into the pipe R with an S-trap S′ and above the latter is arranged a valve S^2 for connecting or disconnecting the pipe S and the pipe R.

The operation is as follows: The liquid subjected to heat in the still A readily evaporates and the vapors pass up the pipe F to

finally strike the dash plate F′ so as to be distributed in the lower part of the condenser H. The vapors circulate up in the condenser through and around the several water cooled sections K and K′ so that the vapors are condensed and pass through the branch pipes L′ into the pipe L and from the latter flow downward into the lower part of the receiver I. In this receiver the glycerine or other product is kept at the proper temperature by regulating the flow of the water or steam through the coil of pipe N, and the glycerine can be withdrawn from the receiver to be discharged into the evaporator J whenever the operator opens the valve O′ in the pipe O. The glycerine in the evaporator J is subjected to the heat radiating from the steam coil Q and also to the heat radiating from the pipe F through which the vapors pass up from the still to the condenser, as previously described. The water vapors finally pass from the evaporator into the flue R to be carried to the usual roof condenser, while the product remaining in the evaporator is drawn off from time to time by opening the valve P′ in the pipe P. The gases in the upper part of the condenser H can pass through the pipe S into the chimney flue whenever the valve S^2 is opened, but any valuable product passing with the gases through the said pipe S is caught in the trap S′, and finally flows from the latter into the pipe R and through the latter into the evaporator J. The receiver serves as a storage reservoir as it permits the condensed vapors coming from the condenser to accumulate and to re-fill the evaporator after the finished product of the previous charge has been withdrawn from the evaporator J.

It is understood that the evaporator J is to be run under vacuum by means of the flue R and the roof condenser (not shown) connected with a vacuum pump. By opening the valve S^2 in the pipe S then the condenser H, as well as the receiver will be run under vacuum, likewise the still A. A fan T may be employed in the pipe F to drive the vapors upward from the still into the condenser. It will be seen that by this arrangement the principal working parts are all confined within the shell G, so that a costly vacuum pan for concentrating purposes is not necessary, and furthermore all the valuable products are completely saved.

It is understood that the still A as well as the evaporator J and receiver I, are provided with the usual thermometers, gages, &c.

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

1. An apparatus of the class described comprising a shell provided with an evaporator, a receiver and a condenser located one above the other, and of which the condenser is connected with the still and discharges the condensed vapors into the receiver which serves as a storage reservoir for the accumulating liquid, and is adapted to charge the evaporator, substantially as shown and described.

2. An apparatus of the class described, comprising a pipe leading from the still, a shell provided with an evaporator, a receiver and a condenser located one above the other and of which the said condenser is connected with the said pipe and discharges the condensed vapors into the said receiver which serves as a storage reservoir for the accumulating liquid and is adapted to charge the evaporator, substantially as shown and described.

3. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, substantially as shown and described.

4. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, and a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, substantially as shown and described.

5. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, and a valved pipe for connecting the said receiver with the said evaporator, substantially as shown and described.

6. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, a valved pipe for connecting the said receiver with the said evaporator, and a steam coil arranged in the said evaporator for heating the contents thereof, substantially as shown and described.

7. An apparatus of the class described, comprising a pipe leading from the still, a shell

into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, an outlet flue connected with the upper end of the said evaporator, and a pipe leading from the upper end of the said condenser and connecting with the said outlet flue, substantially as shown and described.

8. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and containing an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, an outlet flue connected with the upper end of the said evaporator, and a pipe leading from the upper end of the said condenser and connecting with the said outlet flue, the said pipe being provided with a trap, substantially as shown and described.

9. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, an outlet flue connected with the upper end of the said evaporator, a pipe leading from the upper end of the said condenser and connecting with the said outlet flue, a valve arranged in the said pipe, and a trap arranged in the said pipe between the said valve and the said outlet flue, substantially as shown and described.

10. An apparatus of the class described, comprising a pipe leading from the still, a shell into which extends the said pipe and provided with an evaporator, a receiver, and a condenser, located one above the other, the said pipe passing through the evaporator and receiver and discharging into the lower end of the said condenser, water cooled sections arranged in the said condenser, a pipe provided with branch pipes leading into the said condenser between the sections, the said pipe discharging into the said receiver, and a coil of pipe arranged in the said receiver and connected with a water supply and a steam supply, substantially as shown and described.

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Witnesses:
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