(No Model.) 2 Sheets—Sheet 1.

R. O. UNGLAUB.

APPARATUS FOR RECTIFYING GLYCERINE.

No. 481,879. Patented Aug. 30, 1892.

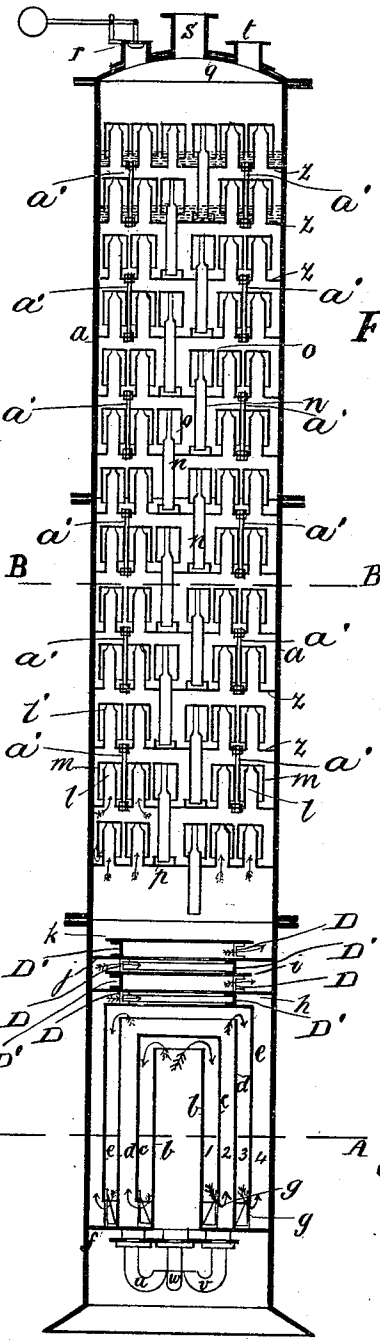

Fig. 1.

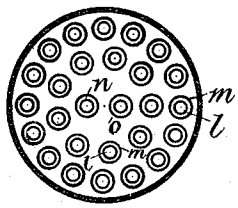

Fig. 3.

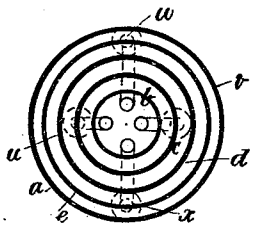

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

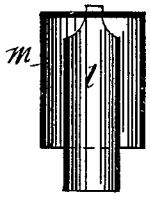


Fig. 5.

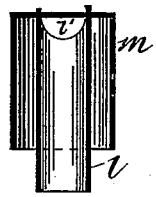


Fig. 6.

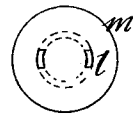


Fig. 7.

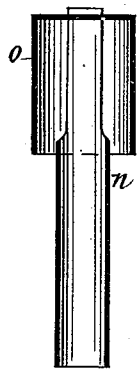


Fig. 8.

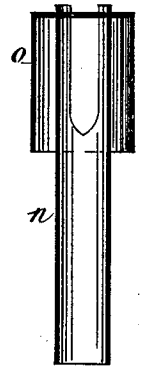


Fig. 9.

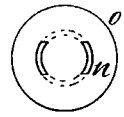


Fig. 10.

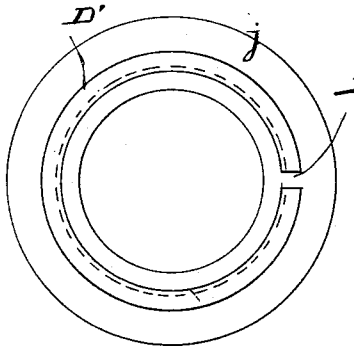


Fig. 11.

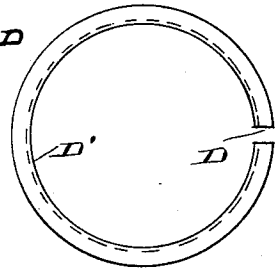
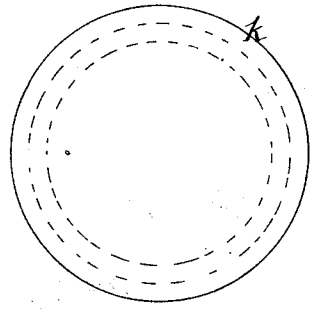


Fig. 12.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT OSCAR UNGLAUB, OF PENDLETON, NEAR MANCHESTER, ENGLAND.

APPARATUS FOR RECTIFYING GLYCERINE.

SPECIFICATION forming part of Letters Patent No. 481,879, dated August 30, 1892.

Application filed October 31, 1891. Serial No. 410,503. (No model.) Patented in England May 16, 1889, No. 8,196.

To all whom it may concern:

Be it known that I, ROBERT OSCAR UNGLAUB, a subject of the Queen of Great Britain, residing at Whit Lane Works, Pendleton, near Manchester, in the county of Lancaster, England, have invented a new and useful Apparatus for Rectifying Glycerine, (for which I have obtained a patent in Great Britain, No. 8,196, bearing date May 16, 1889,) of which the following is a specification.

The object of this invention is to abstract from glycerine the impurities therein contained during the process of distillation.

According to this invention the glycerine is made to traverse upward through a cylinder (preferably of copper) fitted with suitable deflectors. The impurities collect on the deflectors and trickle down to the bottom of the apparatus, while the rectified glycerine-vapor is drawn off at the top of the cylinder by means of a pump and condensed.

In the accompanying drawings, Figure 1 represents a section of an apparatus for rectifying glycerine constructed according to this invention. Fig. 2 is a cross-section of the same on line A A, Fig. 1. Fig. 3 is a cross-section of the said apparatus on line B B, Fig. 1. Figs. 4, 5, and 6 are details, to an enlarged scale, of one of the bonneted pipes hereinafter referred to. Figs. 7, 8, and 9 are details of overflow-pipes and bonnets hereinafter referred to. Figs. 10, 11, and 12 are plan and section of baffle-plates and channel-section ring to an enlarged scale, hereinafter referred to. The same letters and figures denote the same parts in all the figures.

a is a cylinder of copper or other suitable material, containing at its lower end two or more concentric nested cylinders *b c d e*, of any suitable material, whereof *b* and *d* are fastened air-tight to the bottom *f* of the cylinder *a* and are open at the top, and the cylinders *c* and *e* are covered in at the top air-tight, but supported on brackets *g g* at the bottom, leaving a space between the lower edge of the said cylinders and the bottom of the cylinder *a*. Above these cylinders *b c d e* are baffle-plates *h i j k*, composed of circular plates *k i* and annular plates *h j*, attached to channel-section rings D′, one of which is shown in detail at Figs. 10 and 11. These rings are not closed, but have a space D left between the ends, as shown in Figs. 10 and 11. These openings are preferably placed alternately on opposite sides of the cylinder, as shown in Fig. 1. The remainder of the cylinder *a* is divided into compartments by the division-plates *z*, in which are fixed concentric rings of pipes *l*, fitted with bonnets or covers *m*, details of which to an enlarged scale are shown in Figs. 4, 5, and 6. The apparatus is also fitted with two rows of pipes *n*, the upper ends of which are fitted with covers or bonnets *o*, the lower ends thereof dipping into traps *p*. The joint between the plates *z* and the pipes *l* and *n* is made steam-tight by brazing or packing. The upper end of the cylinder *a* is provided with a cover *q*, to which is fitted the safety-valve *r*, opening inward, and the stand-pipes *s* and *t*, to which the pipes for drawing off the purified glycerine-vapor are attached.

u v w x are pipes fitted to the bottom of the cylinder *a* for the purpose of carrying off the impurities which collect in the chambers 1 2 3 4.

The action of the apparatus is as follows: The crude glycerine is boiled in a suitable pan or still, on the top of which the cylinder *a* rests and is secured thereto steam-tight by bolts or other suitable means. The glycerine-vapor rising from the still passes up the cylinder *b*, down between the cylinders *b* and *c*, up between cylinders *c* and *d*, and so on in the direction of the arrows past the baffle-plates *h i j k*, through the pipes *l*, through the orifices *l′* at the top thereof, down between the pipes *l* and bonnets *m*, and so on with each successive tier of pipes till it reaches the top of the apparatus, where it is drawn off by a suitable pump and condensed. The impurities, together with a certain amount of glycerine, cling to the baffle-plates and bonnets and drop down. When a sufficient quantity of impure liquor has accumulated on one division-plate, it overflows and runs down the pipe *n* to the next lower level, and so on till it reaches the chambers 1 2 3 4, when the impure liquor drains by means of the pipes *u v w x* back into the still to be re-evaporated till all the glycerine is driven off and only impurities remain. The liquid settling at each stage forms a trap to prevent the vapor or steam rising, so that the steam in one level is constantly operating on the liquid immediately above

and distilling it, and so on upward, the liquid as it gets into the upper levels getting purer, each stage being more pure than the one immediately below it. The plates *z* are secured together by stay-bolts *a'*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In apparatus for rectifying glycerine, the concentric nested cylinders *b c d e*, forming chambers 1 2 3 4 and open alternately at the top and bottom, the cylinder *a*, bottom *f*, and the pipes *u v w x*, connected with their respective chambers, for carrying off the collected impurities through and from the bottom, substantially as described.

2. In apparatus for rectifylng glycerine, the baffle-plates *h i j k*, consisting of alternate disks and annular rings connected together by channel-section rings D', having spaces D between their ends, substantially as described.

3. An apparatus for rectifying glycerine, consisting of the cylindrical column *a*, vertically divided into chambers by partitions *z*, provided with two or more concentric rows of pipes *l*, fitted with bonnets or covers *m*, bonneted overflow-pipes *n*, and traps, in combination with a series of concentric cylinders *b c d e*, open alternately at the top and bottom, and baffle-plates *h i j k*, all substantially as set forth.

ROBERT OSCAR UNGLAUB.

Witnesses:

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Solicitor, Manchester.

WILLIAM A. SHAWE,
His Clerk.