

(No Model.)

G. I. ROBERTS.
STEAM SEPARATOR.

No. 604,844.

Patented May 31, 1898.

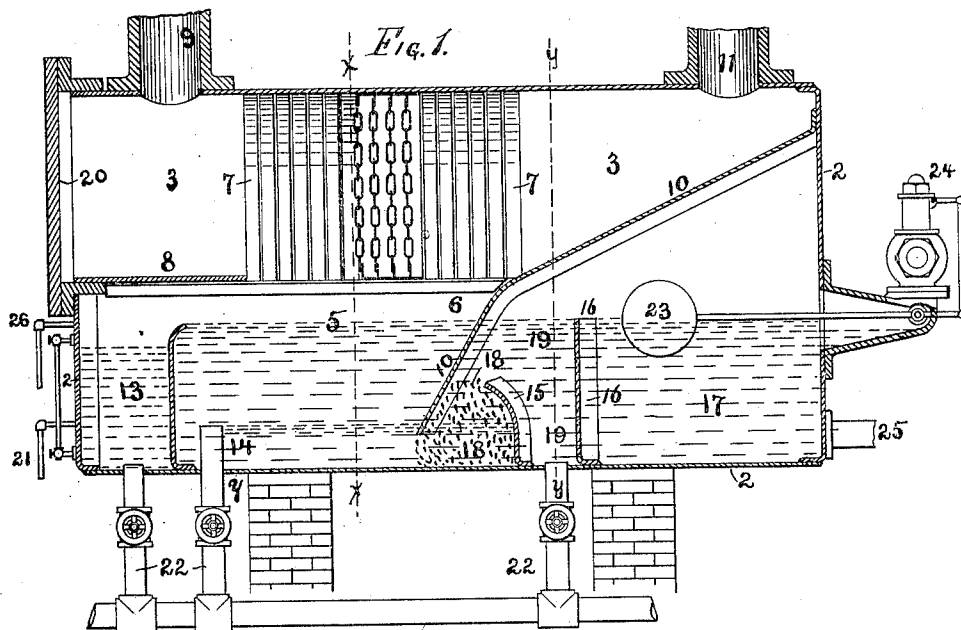


Fig. 2.

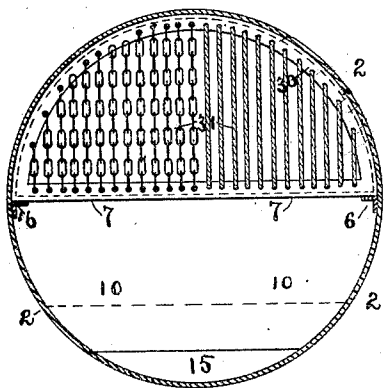
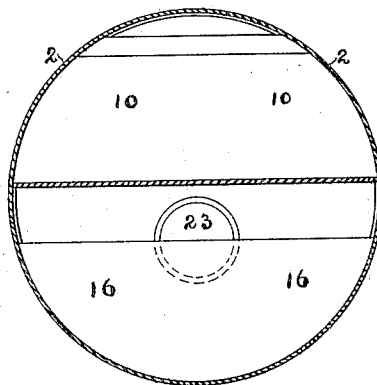


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE I. ROBERTS, OF NEW ROCHELLE, NEW YORK.

STEAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 604,844, dated May 31, 1898.

Application filed January 12, 1898. Serial No. 666,470. (No model.)

To all whom it may concern:

Be it known that I, GEORGE I. ROBERTS, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Steam-Separators for the Removal of Water, Grease, and Foreign Matter or Materials, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to the application of certain additional improvements to the construction, arrangement, and combination illustrated and described in the patent granted to me under date of August 3, 1897, No. 587,560.

The object of these my present improvements is to increase the efficiency, improve the construction, character, scope, and operation of the apparatus and its results, more especially to provide against the possibility of the refuse grease, oil, foreign matters or materials passing in any direction other than through their proper and designated channels or paths of exit; also, to provide for a ready cleansing of all the parts or portions likely to become dirty.

My improvements consist in the special construction, arrangement, and combination of the several parts or portions comprising the improved apparatus, as may be hereinafter described, illustrated, and claimed.

Referring to the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved apparatus. Fig. 2 represents a transverse section of the same on line xx of Fig. 1, looking to the right, showing both chain and rope in baffle-arches. Fig. 3 represents a transverse section of the same on line yy of Fig. 1, looking also to the right.

In the several figures, 2 designates the main shell, inclosing the several parts or portions comprising the separating apparatus. This shell may of course be of any desired shape, form, or configuration, but for strength and lightness it is preferably made cylindrical.

3 designates an upper or steam-receiving compartment into which all surplus, exhaust, unused, or refuse steam or vapor is delivered for treatment, and 5 designates a lower or drip-receiving compartment for the reception

of extraneous oil, water, grease, foreign material or matter sifted, separated, or taken from the steam.

6 designates a pair of supporting-strips, preferably of angle-iron, fastened along the central longitudinal sides of the main shell for the purpose of supporting the removable chain or rope baffle frames 7, already described in Patent No. 587,560, and for likewise supporting a removable horizontally-laid partition-plate 8, resting upon said strips directly beneath the steam-receiving opening 9 and extending to the baffle-frames, leaving an inlet-opening to the lower drip-receiving chamber 5.

10 designates a fixed partition-apron extending from the right-hand upper end a short distance below the steam-discharge opening 11 downwardly, as seen in Fig. 1, past the bottom of baffle-frames to and well into the drip-receiving compartment. A partition-dam 12 is provided over which all surplus lighter matter or materials flow into the oil or grease compartment 13.

14 designates an upwardly-projecting discharge or blow-off nozzle. Partition-apron 10 is carried down to within a short distance of the bottom of the main shell, and all water is forced to pass beneath it. The upwardly-projecting discharge or blow-off nozzle is carried up to a height or elevation above the bottom of partition-apron 12 to prevent in the emptying of the tank any possibility of the oil, grease, or lighter matter or materials getting below or past the bottom of partition-apron 12 and passing out with water when the level of the water is raised.

15 designates an upwardly-projecting retarding-dam located to hinder and prohibit all heavier matter passing to the final delivery-compartment. It is preferably inclined toward, although it may be set vertically to within a short distance of, the partition-apron 10 to provide a reduced area of passage for the water into the next compartment. A final partition-dam 16 is provided, over which all the water flows or falls into the exit-compartment 17. Partition-apron 10 and retarding-dam 15 inclose a compartment 18, into which filtering or clarifying material is preferably packed in case there is considerable impurities in suspension in the drip-water. A settling-

compartment 19 is formed by the retarding-dam 15 and the final partition-dam 16, into which all water passes before rising to overflow into exit-compartment 17.

5 The partition-dam 16 for water and that 10 for oil are both carried to the same overflow height, and the oil, grease, &c., being of less specific gravity than water, naturally floats above water-level and necessarily and readily overflows to the oil-receiving compartment 13, whence it is drawn off or discharged. The retaining-partition 15 should not be carried to the same height as overflow-dams 12 and 16, about one-half the height being preferable and advisable.

15 In the present device the perforated horizontal partition beneath the chain baffles is done away with. The chain baffles, resting upon the strips 6, are allowed and caused to drip directly into the lower compartment 5, as illustrated by drip-lines in Fig. 1, the clearance-spaces between the baffle-frames being sufficient for all drip purposes.

20 In the operation of this device the steam to be cleansed is admitted through receiving-nozzle 9, meets its first resistance in partition-plate 8, whence it reacts and passes through the chain bafflers 7, where it is freed of its foreign matter—water, oil, &c.—passing into the discharge end of upper chamber 3 and out of discharge-nozzle 11. The foreign matter—grease, water, oil, &c.—is sifted from the steam and drips from the chain baffles 7 into the lower drip-receiving compartment 5, whence the lighter materials or matter overflow the partition-dam 12 into oil-discharge compartment 13. The water, being heavier, remains in the drip-receiving compartment 5, passes downward under partition-apron 10, over the retarding-dam 15, and finally over partition-dam 16 into exit-compartment 17 for withdrawal.

45 Before commencing to use the device sufficient water should be entered into the lower drip-receiving chamber to cover thoroughly the bottom edge of the partition-apron 10 and the discharge or blow-off nozzle 14, so that no drip grease, oil, or foreign matter or material of light weight and specific gravity shall reach or pass under the lower edge of the partition-apron 10.

50 To clean the apparatus, cover 20 of the upper compartment is removed, partition-plate 8 and baffle-frames 7 are withdrawn, and free access is at once attained for the cleansing of every portion likely to get dirty. The filtering or clarifying material may be removed from beneath the lower edge of partition-apron 10.

60 In the drawings sixteen of the chain-baffle frames are shown. This number may be increased or decreased, according to requirements, and the inlet or opening to drip-compartment 5 reduced in area by extending either the removable partition 8 or the partition-apron 10, or both, to reach the baffles, according to their preferred location.

23 designates a float automatically operating valve 24 to effect the emptying of water-compartment 17 by gravity, pump, or other well-known means. The same automatic method is preferably used for emptying compartment 13 as well, primarily to save oil and grease for clarifying and future use, and, secondly, to so control the oil or grease level that it shall not flow back toward compartment 5, and thus mar the efficiency of the separator as a whole. In such case outlets 21 or 26, or both, may be used for the purpose. These same outlets 21 and 26 may be used as ordinary blow-outlets for discharging the oil or grease by hand, according to the level shown in the gage-glass 28, the oil or grease being saved or thrown away as desired. With outlet 26 used as a surface-discharge partition-dam 12 may be omitted, if desired, and lower drip-compartment 5 extended to the admission end of the main shell.

22 designates the discharge or blow-off pipes and valves for cleansing the several compartments of any accumulated foul or undesired waste matter or material.

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

1. In a steam-separator, in combination with an upper compartment having inlet and outlet openings, a lower compartment having inlet and outlet openings, a removable cover to said upper compartment, a removable partition-plate, strips supporting the same, a fixed partition-apron, separating said compartments and a plurality of partitions in said lower compartment for controlling the movements of the several drip matters or materials as and for the purposes set forth.

2. In a steam-separator, in combination with the upper and lower compartments, each having inlet and outlet openings, a removable cover to said upper compartment, a removable partition-plate, a transverse baffle device, strips supporting said partition-plate and baffle device, and a partition-apron, as and for the purposes set forth.

3. In a steam-separator, in combination with the upper and lower compartments, each having inlet and outlet openings, a removable cover to the upper compartment, a removable partition-plate, a transverse baffle device in the upper compartment, strips supporting said removable partition-plate and baffle device, and an overflow and underflow exit for the said lower compartment, as and for the purposes set forth.

4. In a steam-separator, in combination with the lower or drip-receiving compartment, a partition-dam over which the lighter foreign matters or materials pass or flow; a partition-apron under which the water passes, an upwardly-projecting retarding-dam, and a final partition-dam over which the water of condensation passes for discharge or exit, as and for the purposes set forth.

5. In a steam-separator in combination with the lower or drip-receiving compart-

ment, a partition-dam over which the lighter
foreign matter or materials pass or flow, a
partition-apron under which the water of con-
densation passes, a discharge-pipe or blow-
5 nozzle extending up from the bottom of said
drip-receiving compartment to a height some-
what above the bottom edge of said partition-
apron, a retaining-partition, and a final par-
10 tion-dam over which the water passes for
the discharge or exit, as and for the purposes
set forth.

6. In a steam-separator, in combination
with the lower or drip-receiving compart-
ment, a partition-dam over which the lighter
15 foreign matter or materials pass or flow, a
partition-apron under which the water of con-
densation passes, a retaining-partition, filter-
ing or clarifying material inclosed by and

between said partition-apron and said re-
taining-partition, as and for the purposes set 20
forth.

7. In a steam-separator in combination
with the lower or drip-receiving compart-
ment, a partition-dam over which the lighter
foreign matter or materials pass or flow, a 25
partition-apron under which the water of con-
densation passes, a retaining-partition, and
a discharge-nozzle extending up from the bot-
tom of said drip-receiving compartment to a
height somewhat above the bottom edge of 30
said partition-apron, as and for the purposes
set forth.

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Witnesses:

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