

S. G. MERRICK.
GAS PURIFIER.
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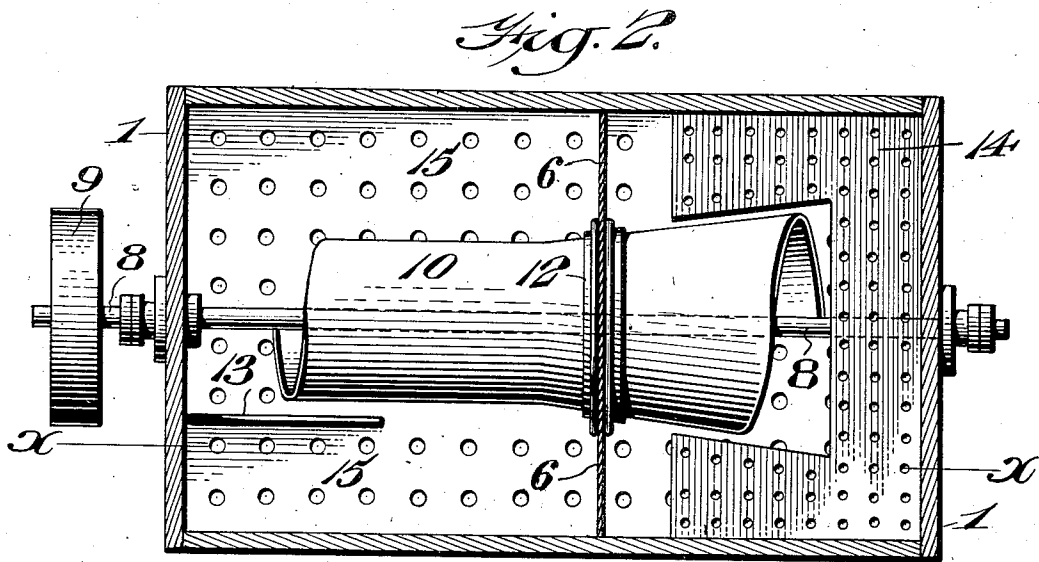
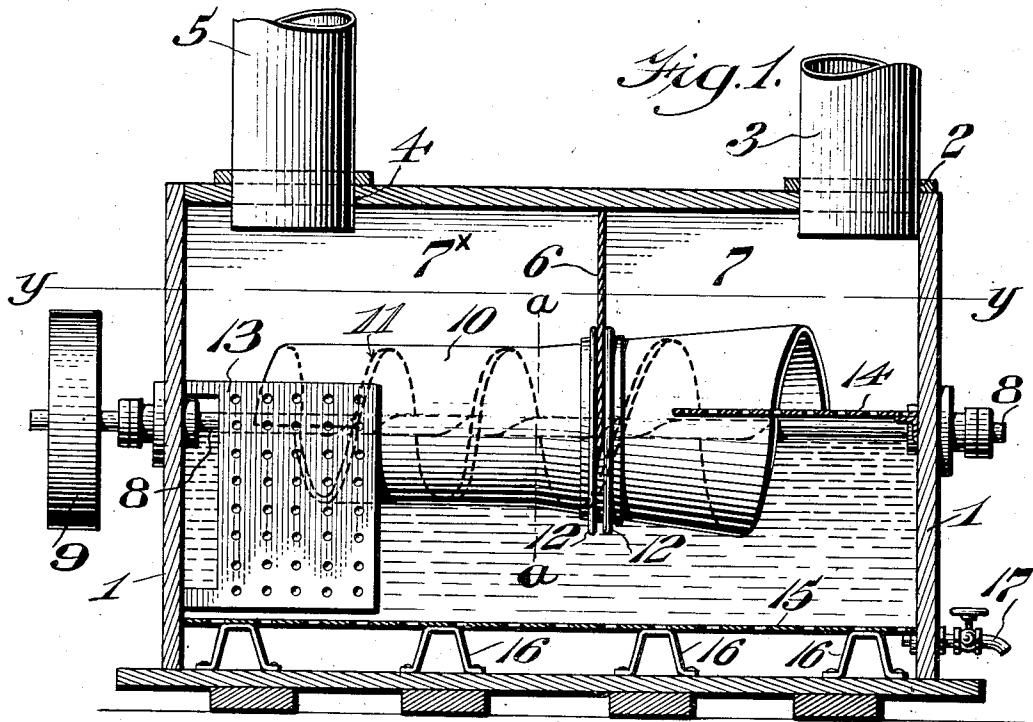
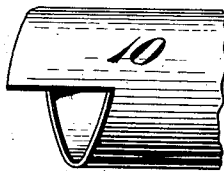


Fig. 3.

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SAMUEL G. MERRICK, OF PHILADELPHIA, PENNSYLVANIA.

GAS-PURIFIER.

946,146.

Specification of Letters Patent. Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, SAMUEL G. MERRICK, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Gas-Purifier, of which the following is a specification.

This invention relates to a new and useful improvement in condensers and more particularly to the type for use in connection with smoke, gases and vapors.

It has for an object to provide an improvement over my former patent No. 689,682, granted December 24th, 1901, whereby an apparatus is produced simple in construction, efficient in service comprising a minimum of parts and producing a new and useful result. The parts thereof are arranged to form a complete unitary structure reducing the power applied and by a compressing action completely separating and breaking up the gaseous products.

Figure 1 represents a condenser embodying my invention and is a section taken on line $x-x$ Fig. 2. Fig. 2 represents a section of the same on line $y-y$ Fig. 1. Fig. 3 represents a detail of construction.

For the purpose of illustrating my invention I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

1 designates a suitable casing mounted in any desired manner and having an inlet opening 2 therein adapted to receive, in the present instance, a supply pipe 3 by means of which the smoke, vapor and like gases are introduced into the interior of the said casing, while 4 designates an outlet opening adapted, as here shown, to receive an exhaust pipe 5 by way of which any remaining smoke or vapor escapes to the exterior of the receptacle.

6 designates a plate or partition suitably secured to the casing 1 and separating the receiver 1 into receiving and delivery chambers 7 and 7*.

8 designates a shaft suitably mounted for rotation in the casing 1 and passing trans-

versely therethrough, the same having a suitable pulley 9 fixedly mounted thereon and adapted to receive power from any suitable source. This shaft 8 carries thereon a tubular member 10 having a spiral partition 11 running throughout the length thereof and preferably forming a single spiral, whereby upon rotation of the shaft 8 the smoke, gases and other vapors are conveyed from the receiving chamber to the delivery chamber. In connection with this tubular member it will be noted that the portion located, in the present instance, to the right, as seen in Fig. 1 of the partition 6 in the receiving chamber is preferably formed of substantially the shape of a frustum of a cone, while the portion on the other side of said partition has approximately a cylindrical form which is preferably and for the highest efficiency constructed of a length substantially greater than the length of the frustum portion, measurements being taken from the point $a-a$, as indicated in Fig. 1.

Special attention is directed to the elongated, cylindrical form of the tubular member forming a continuation of the frustum portion thereof since the function of this part is an important one in that it produces a choking or compressing effect to the gases and liquids passing through the spirals which makes the separating action an exceedingly efficient one in that the compression and purifying instead of ceasing at the end of the frustum portion is continued through the cylindrical portion thus increasing the efficiency of the apparatus to a material degree.

In order to prevent the gas from passing between the partition 6 and the outside of the tubular member 10 flanges 12 are secured to the outer circumference of the member 10 and in close proximity to the partition 6 whereby upon rotation of the member 10 the liquid is carried around between the flanges 12 forming an effective seal to prevent leakage of the gas. In practice it is preferable to employ suitable packing devices adjacent the flanges 12 in order to aid in forming a perfect seal.

At the outlet end of the tubular member 10 a baffle plate 13 is preferably located which serves the purpose of breaking up the liquid within the tank and effecting a thorough mixture of the same with the entering gas while adjacent to the inlet end of the tubular member is a somewhat similar

plate 14 which, as shown in Fig. 2, passes in close proximity to the said inlet and extends for some little distance on either side of the tubular member.

15 15 designates a plate preferably perforated and suitably supported upon brackets 16 secured to the bottom of the casing 1, the object of said plate being to prevent too violent agitation of the liquid in the lower levels of the receptacle so that the heavier contained liquids may be easily disengaged or separated and collected in the bottom of the tank from which they may be removed by means of a blow-off valve 17 or the like as may be desired.

Special attention is directed to the frustum formation wherein the smoke and gases are picked up and conveyed through the tubular member and it will also be noted that the substantially horizontal and cylindrical continuation of the frustum permits a full compression and purifying of the gas taken in that is, where the horizontal section meets the conical section is the point of maximum compression and minimum condensation. The gas, confined within the horizontal section and subjected to the action of the water, is more thoroughly washed and purified by reason of the compression and condensation before mentioned.

It will of course be understood that the shaft 8 is located at approximately the liquid level of the casing so that when the shaft 8 is rotated the tubular member 10 will be a sufficient distance out of the liquid to pick up the gases and convey them from one end to the other as will be clear.

In operation the machine is started and as the gases enter through the inlet they are picked up by the tubular member and directed by the spiral partition through the liquid and discharged at the outlet end in a condensed and separated condition effected during the travel through the said member.

25 The plate 14 plays an important part in the arrangement of my conveyer in that it aids materially and actually prevents the wash and surge of the water or liquid in the inlet chamber, keeping the liquid in a quiet state and a level surface and at all times allows the inlet end of the frustum to receive its full capacity of gas or vapor. The perforated plate adjacent the discharge portion receives the fluid from the discharge end and breaks up all bubbles and aids in liberating the gas. It will be apparent that this plate extends a sufficient distance above the normal level of the liquid within the casing 1 in order that bubbles and the like discharged above the level may be broken up.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as described in the statement of invention and the above description, and while I

have in the present instance shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening communicating respectively with the receiving and delivery chambers of said casing.

2. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening communicating respectively with the receiving and delivery chambers of said casing, and a perforated plate located adjacent the bottom of said casing.

3. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening communicating respectively with the receiving and delivery chambers of said casing, and a perforated baffle plate adjacent the outlet end of said tubular member.

4. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening communicating respectively with the receiving and delivery chambers of said casing, and a vertically disposed baffle plate located adjacent the bottom of said casing.

5. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening

communicating respectively with the receiving and delivery chambers of said casing, and a baffle plate located adjacent the inlet of said tubular member.

5 6. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member
10 having an elongated cylindrical portion terminating in a frustum of a cone and an inlet and an outlet opening communicating respectively with the receiving and delivery chambers of said casing, and a horizontally disposed perforated baffle plate adjacent the inlet of said tubular member.
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7. In a condensing apparatus, a casing having a receiving and delivery chamber, means forming communication with each
20 chamber, a tubular member rotatably mounted in said casing and having a spiral lo-

cated therein, a perforated baffle plate adjacent each end of said tubular member, and a perforated baffle plate positioned adjacent the bottom of said casing.

25 8. In a condensing apparatus, a casing provided with receiving and delivery chambers, a tubular member rotatably mounted in said casing, a spiral in said tubular member forming a conveyer, said tubular member
30 having an elongated cylindrical portion terminating in a frustum of a cone, said cylindrical portion being of greater length than the frustum portion and an inlet and outlet opening for said tubular member communicating respectively with the receiving
35 and delivery chambers of said casing.

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