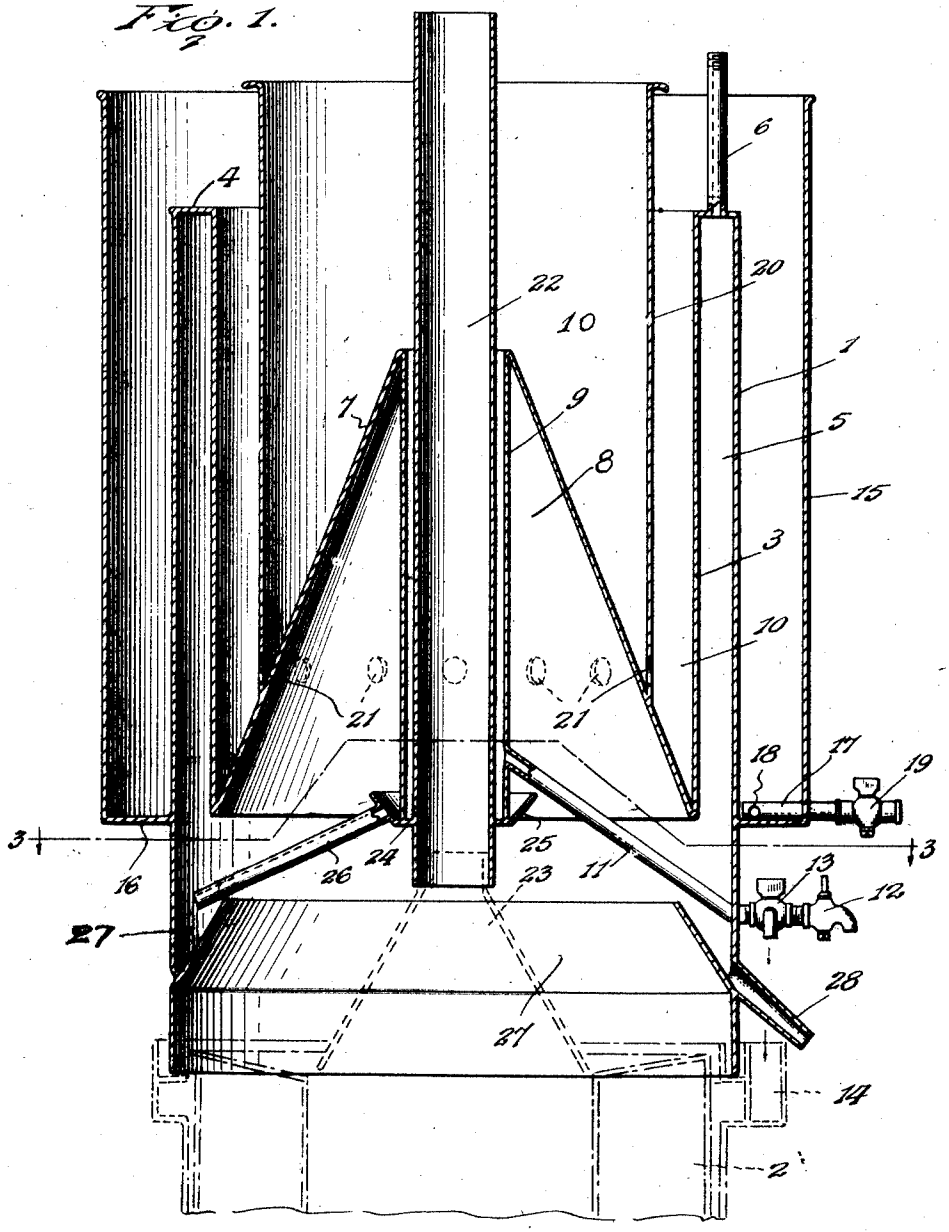
Aug. 6, 1929. E. V. OLIVER 1,723,575

CONDENSER

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Fig. 1.



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Fig. 2.

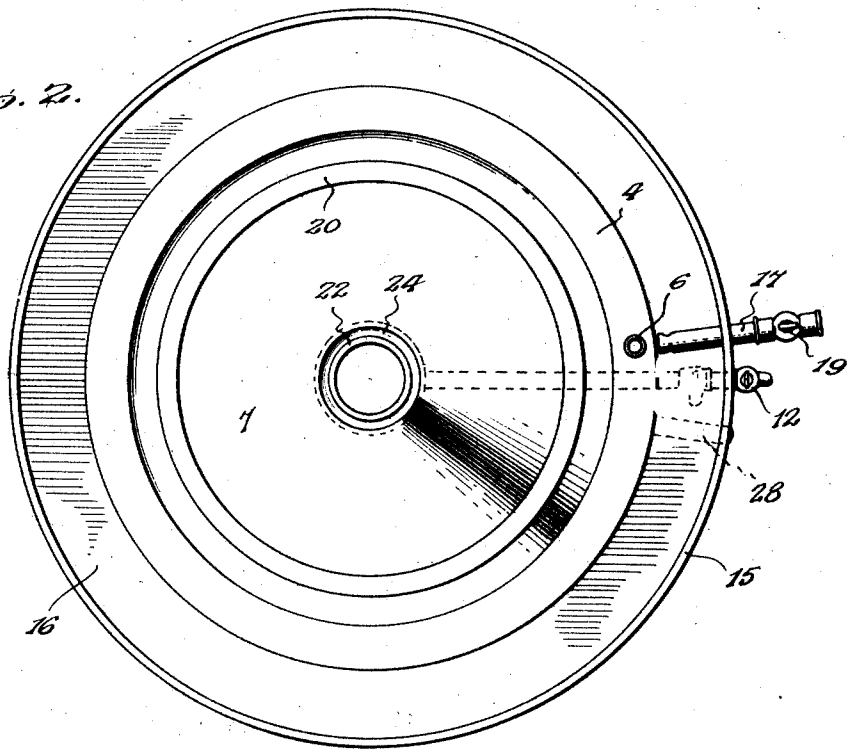
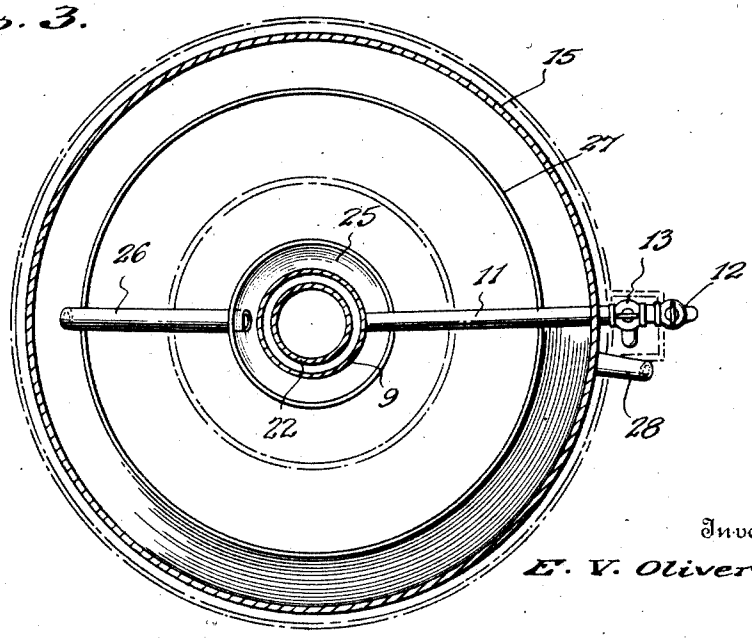


Fig. 3.



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Patented Aug. 6, 1929. 1,723,575

UNITED STATES PATENT OFFICE.

ERNON V. OLIVER, OF PHOENIX, ARIZONA.

CONDENSER.

Application filed March 7, 1928. Serial No. 259,842.

This invention relates to stills and more particularly to a condenser adapted to be supported upon a boiler forming part of a still so that steam arising from the boiler may be converted into pure water.

One object of the invention is to provide a condenser which will be of a compact construction so that it may be readily supported in an upright position upon a companion boiler and steam arising from the boiler pass directly into the condenser.

Another object of the invention is to so arrange surface condensing compartments in the condenser that their walls will constitute walls for water compartments through which cooling water passes and to cause the water to flow through the condenser in such a path that the walls between the water compartments and condensing chambers will be very effectively cooled and steam passing into the condensing chambers thereby caused to be quickly converted into pure water.

Another object of the invention is to so form the condenser that when it is set in place upon a boiler products of combustion from the heating unit of the boiler may pass upwardly through an outlet flue disposed centrally of the condenser.

Another object of the invention is to provide a condenser which will be of a simple construction and consist of a comparatively few number of parts and not liable to be damaged if roughly handled.

The invention is illustrated in the accompanying drawings, wherein

Figure 1 is a vertical sectional view through the improved condenser, a boiler with which it is to be used being indicated by dotted lines;

Fig. 2 is a top plan view of the condenser, and

Fig. 3 is a transverse sectional view through the condenser taken on the line 3—3 of Fig. 1.

The body portion of the improved condenser is open at its bottom and includes an outer annular wall 1 adapted to rest upon a companion boiler, such as indicated by dotted lines in Fig. 1 and designated by the numeral 2. It will thus be seen that the condenser will be disposed above the boiler and steam arising from water in the boiler may pass directly into the body portion of the condenser through its open lower end. The inner wall 3 of the body is of less depth than the outer wall and at its upper end is joined to the upper end of the outer wall by a circumferentially extending head 4. The space 5 between the inner and outer walls of the body constitutes an outer condensing chamber into which steam passes and is returned to a liquid state by contact with the walls of this chamber. The pipe 6 which rises from the head 4 is to permit obnoxious gases to escape, and it will be understood that any number of these pipes desired may be provided. A dome 7, which is of a frusto-conical formation and defines an inner condensing chamber 8, is disposed centrally of the body with the lower margins of its walls joined to the inner wall 3 of the body at the lower edge thereof. A sleeve 9 is disposed centrally of the drum and has its upper end joined to the dome.. By an inspection of Fig. 1, it will be seen that the dome 7 and the inner wall 3 of the body define a water compartment 10 from which cooling water may pass through the sleeve 9 and be discharged from the condenser through a pipe 11 which extends outwardly through the outer wall in spaced relation to the lower end thereof. This discharge pipe carries a spigot 12 which may be opened so that water may flow from the condenser, and it will be understood that, if so desired, a rubber hose or the like may be connected with the spigot so as to conduct the cooling water to a sewer or other place of disposal. This pipe has also been provided with a second spigot or valve 13 which, when opened, will permit water to be fed into the boiler through its water inlet 14 and thus replenish the supply of water in the boiler when necessary. A water jacket 15 is provided about the body portion of the condenser and adjacent its bottom 16 which is joined to the outer wall of the body the annular wall of the water jacket is formed with an opening through which a feed pipe 17 extends. The pipe 17 is, of course, firmly secured in the opening through which it passes to prevent leakage and has its inner end portion formed with a discharge opening 18 and its outer end connected with a coupling valve 19 to which a pipe or other conduit leading from a source of water supply may be connected. The walls of the water jacket extend upwardly above the body, and it will be readily seen that water admitted to the water

jacket through the pipe 17 will move upwardly therein and flow over the head 4 into the water compartment 10. An annular baffle 20 which extends above the body is disposed in the water chamber with its lower end secured to the dome 8 in spaced relation to its bottom and this baffle is formed with a suitable number of openings 21 close to its lower end. Therefore, the water which enters the water chamber from the water jacket must first pass downwardly between the inner wall 3 and baffle and after passing through the openings 21 move upwardly between the baffle and dome in order to reach the top of the dome and pass downwardly through the sleeve 9 to the discharge pipe 11. By this arrangement the inner and outer walls of the body and the dome and sleeve will be cooled in a very effective manner so that steam in the inner and outer condensing chambers will be converted into a liquid by engagement with the water cooled surfaces. A flue 22 which serves as an outlet for smoke and other products of combustion discharged through the products of combustion outlet 23 of the boiler extends vertically through the sleeve 9 with its upper portion projecting upwardly above the upper edges of the baffle and water jacket and its lower portion extending downwardly from the sleeve a sufficient distance to be engaged about the products of combustion outlet of the boiler. A collar 24 is carried by the flue 22 and firmly engaged with the lower end of the sleeve to form a closure for the lower end of the sleeve about the flue and this collar is extended radially from the lower end of the sleeve to provide a gutter 25 adapted to catch water which condenses against the sleeve and flows downwardly along the same. This gutter is provided with an outlet pipe 26 which projects from the same, as shown in Figs. 1 and 3, and terminates above a gutter 27 carried by the outer wall of the body in spaced relation to the lower end thereof. The gutter 27 not only receives water from the pipe 26 but also catches water which flows downwardly upon the inner surface of the outer wall from the condensing chamber 5 and it extends upwardly and inwardly to such an extent that water which condenses against the inner or under surface of the dome 7 and drips from its lower edge and the water flowing downwardly upon the inner wall 3 of the body will be caught. It will thus be seen that all of the water formed by steam condensing in the outer and inner condensing chambers 5 and 8 will be received in the gutter 27 from which it passes through a discharge pipe 28 projecting from the outer wall of the body. The water which flows from the discharge pipe 28 may be caught in a receptacle placed beneath it or a rubber hose or other suitable conduit may be connected with the pipe 28 in order to conduct the distilled water to a suitable receptacle located at a greater distance from the still.

Having thus described the invention, I claim:

1. A condenser comprising a body having a central condensing chamber and an outer condensing chamber about the central chamber, adjacent walls of the condensing chambers defining a water chamber between the same, a water jacket surrounding said body and having an inlet adjacent its bottom, the water jacket extending above the body whereby water may flow therefrom over the walls of the body into the water chamber, a sleeve in the inner condensing chamber opening through the top thereof and constituting an outlet for the water chamber, a closure for the lower end of said sleeve, and a discharge pipe leading from said sleeve adjacent its lower end.

2. A condenser comprising a body having a central condensing chamber and an outer condensing chamber about the central chamber, adjacent walls of the condensing chambers defining a water chamber between the same, a water jacket surrounding said body and having an inlet adjacent its bottom, the water jacket extending above the body whereby water may flow therefrom over the walls of the body into the water chamber, a sleeve in the inner condensing chamber opening through the top thereof and constituting an outlet for the water chamber, a flue extending through said sleeve in spaced relation to the walls thereof and projecting above and below the same with its upper portion extending above the body, a collar carried by said flue and constituting a closure for the lower end of the sleeve, and a discharge pipe leading from said sleeve adjacent its lower end.

3. A condenser comprising a body having a central condensing chamber and an outer condensing chamber about the central chamber, adjacent walls of the condensing chambers defining a water chamber between the same, a water jacket surrounding said body and having an inlet adjacent its bottom, the water jacket extending above the body whereby water may flow therefrom over the walls of the body into the water chamber, a sleeve in the inner condensing chamber opening through the top thereof and constituting an outlet for the water chamber, a flue extending through said sleeve in spaced relation to the walls thereof and projecting above and below the same with its upper portion extending above the body, a collar carried by said flue and constituting a closure for the lower end of the sleeve and extended radially therefrom to form a gutter encircling the sleeve, a drain pipe leading from said gutter, a discharge pipe leading from said sleeve adjacent its lower

end, and an internal gutter carried by the outer wall of said body and provided with an outlet through the said wall of the body, the last-mentioned gutter projecting inwardly beneath the inner condensing chamber.

4. A condenser comprising a body having a central condensing chamber and an outer condensing chamber about the central chamber, adjacent walls of the condensing chambers defining a water chamber between the same, a water jacket surrounding said body and having an inlet adjacent its bottom, the water jacket extending above the body whereby water may flow therefrom over the walls of the body into the water chamber, a sleeve in the inner condensing chamber opening through the top thereof and constituting an outlet for the water chamber, a closure for the lower end of said sleeve, a discharge pipe leading from said sleeve adjacent its lower end, and an annular baffle in the water chamber extending above the same and formed with water passages adjacent the lower end of the water chamber.

5. A condenser comprising a body having an outer wall, an inner wall joined at its upper end to the outer wall and a central dome joined at its bottom to the inner wall and tapered upwardly and having an internal axially disposed sleeve joined at its upper end to the top of the dome, the dome and walls of the body defining inner and outer condensing chambers, a water jacket about said body extending above the same and having its lower end joined to the body and provided with a water inlet, an annular baffle about said dome to guide water downwardly and then upwardly through the space between the dome and inner wall of the body from the water jacket into the upper end of the sleeve, an outlet pipe leading from the sleeve adjacent its lower end and projecting outwardly from the body, a closure for the lower end of said sleeve having a portion extending about the same to form a gutter, a drain pipe leading from said gutter, and an internal annular gutter carried by the outer wall of the body and provided with a draining outlet.

6. A condenser comprising a body having an outer wall, an inner wall joined at its upper end to the outer wall and a center dome joined at its bottom to the inner wall and tapered upwardly and having an internal axially disposed sleeve joined at its upper end to the top of the dome, the dome and walls of the body defining inner and outer condensing chambers, a water jacket about said body extending above the same and having its lower end joined to the body and provided with a water inlet, an annular baffle about said dome to guide water downwardly and then upwardly through the space between the dome and inner wall of the body from the water jacket into the upper end of the sleeve, an outlet pipe leading from the sleeve adjacent its lower end and projecting outwardly from the body, a flue extending through said sleeve in spaced relation to its walls and projecting from the ends thereof with its upper portion extending above the body, a collar carried by said flue and constituting a closure for the lower end of the sleeve and extended upwardly to form a gutter, and a drain pipe leading from the gutter.

7. A condenser for stills comprising a body having an outer annular wall, an inner annular wall and a center dome provided with an internal sleeve joined thereto at its upper end, the inner wall having its upper end joined to the outer wall and its lower end joined to the lower end of the dome, the inner wall together with the dome and outer wall defining inner and outer condensing chambers, a water jacket about said body having its lower end joined to the outer wall above the lower end thereof and provided with a water inlet and its upper portion extending above the body whereby water may flow over the walls of the body into the space between the inner wall and dome and through the sleeve, an outlet pipe leading from the sleeve adjacent its lower end and extending through the outer wall below the water jacket, an annular baffle disposed about the dome with its lower end joined to the dome above the lower end thereof and formed with water passages, an internal gutter carried by the outer wall and having an outlet, a closure for the lower end of said sleeve having an extension constituting a gutter about the sleeve, and a drain pipe leading from the gutter about the sleeve.

8. A condenser for stills comprising a body having an outer annular wall, an inner annular wall and a center dome provided with an internal sleeve joined thereto at its upper end, the inner wall having its upper end joined to the outer wall and its lower end joined to the lower end of the dome, the inner wall together with the dome and outer wall defining inner and outer condensing chambers, a water jacket about said body having its lower end joined to the outer wall above the lower end thereof and provided with a water inlet and its upper portion extending above the body whereby water may flow over the walls of the body into the space between the inner wall and dome and through the sleeve, an outlet pipe leading from the sleeve adjacent its lower end and extending through the outer wall below the water jacket, an annular baffle disposed about the dome with its lower end joined to the dome above the lower end thereof and formed with water passages, an internal gutter carried by the outer wall and having an outlet, a flue ex-

tending through said sleeve with its ends projecting therefrom and its upper end portion extending above the body, a collar carried by said flue and constituting a closure for the lower end of the sleeve and extended to form a gutter, and a drain pipe leading from the last-mentioned gutter.

9. A condenser for stills comprising a body portion open at its bottom and having an annular wall adapted to rest upon a still, an inner wall for said body joined at its top to the upper end of the outer wall of the body and terminating in spaced relation to the lower end thereof, a water jacket disposed about the body with its upper portions extending above the body and having a bottom joined to the outer wall of the body above its lower end, means for admitting water into the water jacket adjacent its bottom, a dome in said body joined to the lower end of the inner wall and having an internal sleeve joined to and depending from its upper end, an annular baffle in said body having its lower end joined to said dome above the lower end thereof and formed with water passages and its upper portion projecting above the body, an internal annular gutter carried by the outer wall of said body adjacent its lower end and extending upwardly beneath the dome, an outlet being provided for the gutter through the outer wall of the body, a flue extending through the sleeve in spaced relation to the walls thereof with its upper end projecting above the baffle, a collar carried by said flue and closing the lower end of the sleeve and constituting a gutter about its lower end, a drain pipe leading from said collar and terminating above the gutter of said body, and an outlet pipe leading from said sleeve adjacent its lower end and projecting outwardly from the body below the water jacket.

In testimony whereof I affix my signature.

ERNON V. OLIVER. [L. S.]