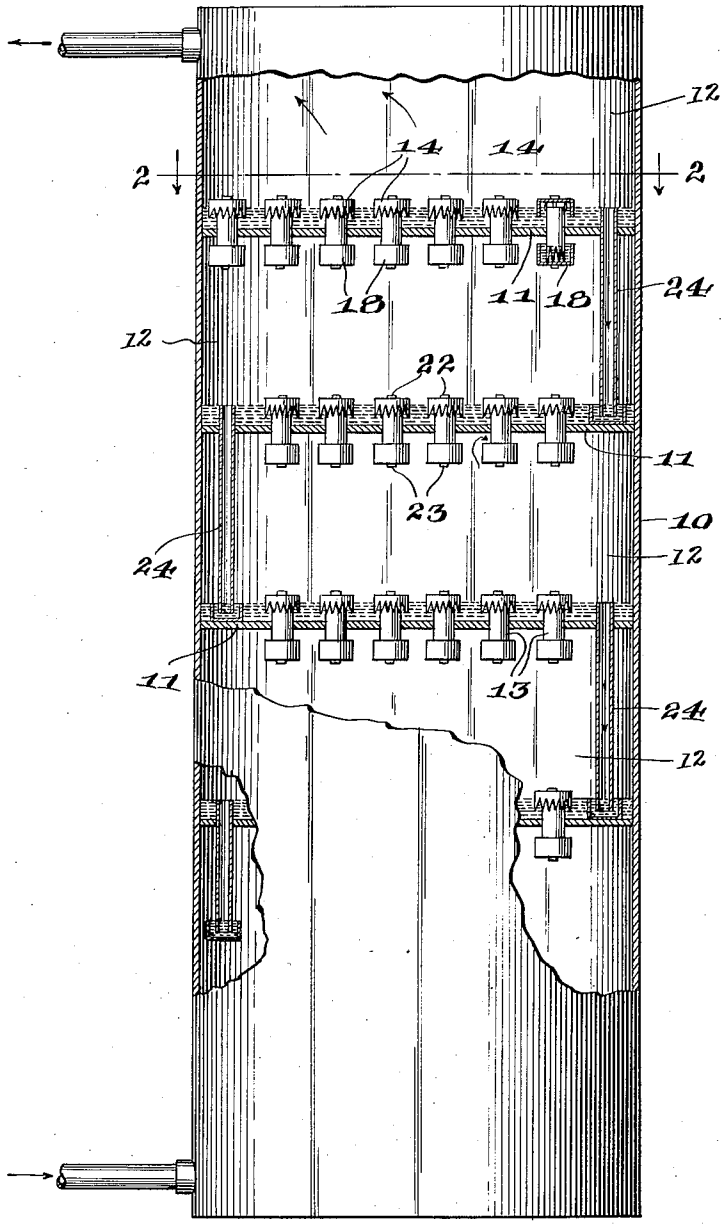
July 5, 1932. M. L. BERRYMAN 1,865,818

BUBBLE CAP FOR OIL DISTILLING APPARATUS

Original Filed Nov. 13, 1929 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

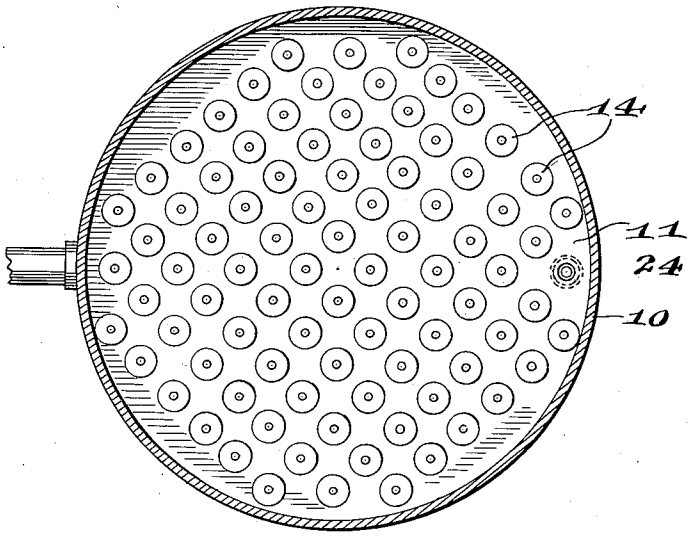
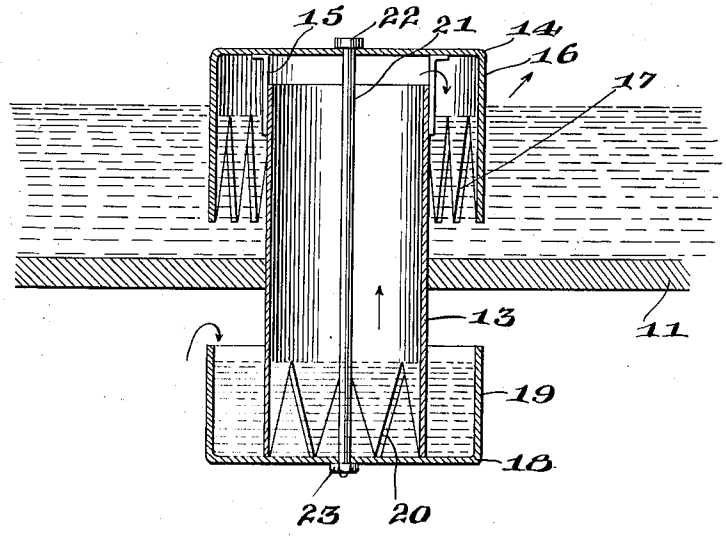


Fig. 3.



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UNITED STATES PATENT OFFICE

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BUBBLE CAP FOR OIL DISTILLING APPARATUS

Application filed November 13, 1929, Serial No. 406,911. Renewed May 19, 1932.

The present invention relates to improvements in bubbler caps for oil distilling apparatus, or any hydrocarbon compound, and has for an object to provide a twin cap which will perform a double duty and aid in the more efficient distilling of the oils, or any hydrocarbon compound.

Another object of the invention is to provide a twin cap device in which the usual form of cap may extend in the upper chamber above the tube, while the improved cap will lie in the chamber below and be held in conjunction with the lower end of such tube, whereby caps will be provided for both ends of the tube and in both chambers.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevation of a tower with parts broken away showing the improved device,

Figure 2 is a cross section taken on the line 2—2 in Figure 1, and

Figure 3 is an enlarged vertical section taken through one of the improved devices.

Referring more particularly to the drawings, 10 designates the tower containing the trays or partitions 11, which separate the tower into chambers 12.

The tube is indicated at 13, and is usually four inches in diameter and approximately nine inches long. This tube 13 has its open upper end disposed in the chamber 12 above, and its open lower end of the chamber beneath such tray 11.

In the form of device heretofore used, an upper cap 14 was provided, being held spaced above the upper open end of the tube 13 as by the shoulders or brackets 15. This old form of cap 14 is provided with a depending flange 16 of greater diameter than the tube 13 and which extends down and overlaps the upper part of the tube, the lower free edge of the flange 16 being serrated or scalloped, as indicated at 17.

In accordance with the present invention, I provide a lower cap 18 inverted with respect to the upper cap 14, and I press this lower cap 18 directly against the lower end of the tube 13 in the chamber 12 below the tray 11. The cap 18 is provided with an upstanding circular flange 19, which is of considerably greater diameter than the diameter of the tube 13, and forms an annular channel about the lower end of the tube 13 and within the flange 19. The flange 19 opens upwardly into the interior space of the lower chamber 12. The upper free edge of the flange 19 is preferably smooth or unprovided with serrations. The serrations are provided upon the lower end of the tube 13, as shown at 20, these serrations providing a means of communication between the interior of the tube 13, and the annular channel confined within the flange 19, and exterior of the lower part of the tube 13.

The lower cap 18 is held in place by the bolt 21 having the head 22 which lies above the cap 14, and provided with the nut 23 below the lower cap 18, the bolt passing through both caps 14 and 18. Of course, the head 22 might be disposed down below cap 18 and the nut 23 above cap 14, if desired. The bolt holds both caps in place in a tight and secure manner.

In operation, the vapors carrying more or less of the entrained liquid from the tray in the lower chamber ascending strike the tray 11 and enter the mouth of the annular chamber within the flange 19 of the lower cap 18. As the vapors enter the annular chamber formed by cap 18, the entrained liquid is deposited in said chamber.

From such annular chamber, the vapors pass through the slots or serrations 20 and enter the lower part of the tube 13, ascending in such tube until the same strike the upper cap 14. This upper cap tends to separate or deflect the vapors and to guide them downwardly through the annular chamber within the flange 16, and the vapors pass out downwardly through the serrated edge 17 and into the upper fractionating chamber.

In this way, a double duty is performed by the improved tubes 13 which carry twin caps,

namely, one cap above and a companion cap below.

Figures 1 and 3 illustrate how the liquid stands in the trays in and around the caps. In Figure 1 is shown a leg 24 or channel for the liquid to flow back or reflux, as indicated by the arrows. The vapors travel upwardly as also indicated by the arrows.

According to my method a double distillation takes place because the oil and vapors pass through a double set of caps. Also as the condensed liquid overflows from the lower caps, it is sprayed into the lower chamber and exposes more surface for evaporation. There is a double liquid seal of the vapors. This method is especially good for vacuum distillation, where the vapors are drawn and not forced through. This double distillation will produce better fractionation with less trays.

It will be obvious that many changes in the construction, combination and arrangement of parts could be made, which could be used without departing from the spirit of my invention, and I do not mean to limit the invention to such details, except as particularly pointed out in the claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. An improved bubbler cap device comprising a tube, an upper flanged cap held in spaced relation above the upper end of the tube, a second cap inverted with respect to the upper cap and pressed against the lower serrated portion of the tube, an upstanding flange on the last mentioned cap, and means passing through both of said caps for suspending the lower cap from the upper cap.

2. An improved bubbler cap device comprising a tube, an upper flange cap held in spaced relation above the upper end of the tube, a second cap inverted with respect to the upper cap and pressed against the lower serrated portion of the tube, and an upstanding flange on the last mentioned cap.

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