Sept. 16, 1930. J. E. KOBERNIK 1,776,033

BUBBLE CAP

Filed Jan. 5, 1928

Fig. 1.

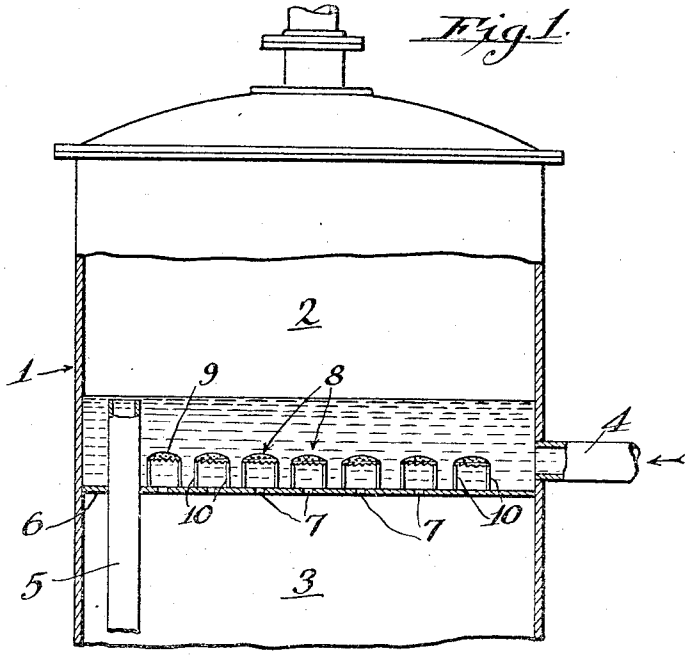


Fig. 2.

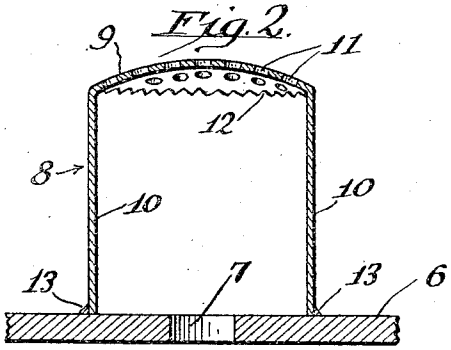


Fig. 3.

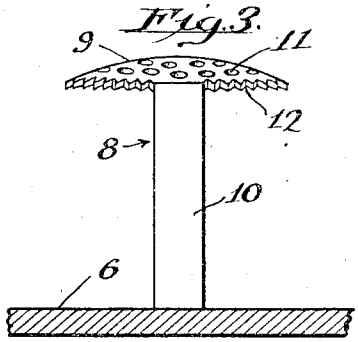


Fig. 4.

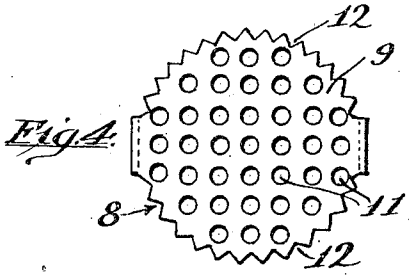
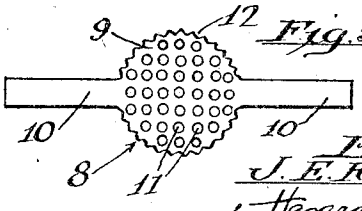


Fig. 5.



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Patented Sept. 16, 1930

1,776,033

UNITED STATES PATENT OFFICE

JULIUS E. KOBERNIK, OF LOS ANGELES, CALIFORNIA

BUBBLE CAP

Application filed January 5, 1928. Serial No. 244,615.

My invention relates to a bubble cap for use in apparatus for treating hydrocarbons in which apparatus absorbing, distilling, fractioning or stabilizing operations are carried on, especially in the production of motor fuel. In the apparatus of the class referred to, a gas or vapor is caused to pass upwardly through the apparatus, and in its upward passage is repeatedly brought in contact with a liquid hydrocarbon passing in the opposite direction by gravity.

One of the features of such apparatus is to cause a most intimate and repeated contact between the gases or vapors, and the hydrocarbon liquid under treatment. Such apparatus usually contains a series of mixing or reaction chambers vertically arranged one above the other. The partitions separating the chambers are perforated and over these perforations a so-called bubble cap is disposed, the object of such bubble caps being to divide into fine bubbles the ascending gases or vapors and to thoroughly mix such bubbles of gas and vapors with the liquid in which the bubble caps are immersed. Such apparatus has provisions for submerging the bubble caps to a predetermined depth.

The present invention relates to a bubble cap, and it is an object of the invention to provide a simple and highly efficient structure easily made and installed.

My invention consists in the construction and arrangement of parts hereinafter described and claimed.

Referring to the accompanying drawings which form a part of this specification.

Figure 1 shows a fragmentary view partly in section, of an apparatus for treating hydrocarbons such for instance, as disclosed in my U. S. Patent No. 1,613,352, of January 4, 1927.

Figure 2 is a vertical cross section of my bubble cap positioned over a perforation of a partition.

Figure 3 is a side elevation of the bubble cap shown in Figure 2.

Figure 4 is a top plan view thereof.

Figure 5 shows the blank of metal of which the bubble cap is formed.

The particular type of apparatus as stated before, is immaterial, the invention relating merely to the bubble cap placed over a perforation of a partition through which perforation the ascending gases and vapors pass and are caused to be mixed with the hydrocarbon liquid in which the bubble caps are submerged.

1 indicates the shell of the apparatus; 2 a reaction chamber therein; 4 a hydrocarbon inlet; 5 an overflow pipe conducting the hydrocarbon liquid from chamber 2 to chamber 3 immediately below; 6 indicates the partition separating the chambers 2 and 3, the partition being provided with perforations 7 over which bubble caps 8 constituting the object of my invention are disposed.

The bubble cap 8 is formed out of a sheet of metal shown in Figure 5, which consists of a circular top portion 9 and a pair of leg portions 10 integral with the top and diametrically disposed. The top portion 9 is preferably dished or convex, as shown in Figures 2 and 3, and provided with perforations 11. The periphery of the top portion 9 is serrated at 12. The leg portions 10 are bent at right angles downwardly from the top portion 9 and are placed equidistantly and in alignment with perforations 7 of the partition 6 and preferably secured thereto by spot welding as indicated at 13.

In the operation of the device, the hydrocarbon gases and vapors pass upwardly from chamber 3 to chamber 2 through perforations 7, the pressure of the gas or vapor being such as to prevent any appreciable amount of the hydrocarbon liquid in chamber 2 from escaping back through perforations 7 into chamber 3. The bubbles of gas and vapor in the upward movement, strike against the dished perforated top portion 9 of the bubble cap, and are divided into small bubbles in passing therethrough. If a pressure builds up below the top portion 9 and the gas passes the periphery of the same, owing to the serrations 12, the gas will be divided into fine bubbles, the result being a violent boiling action about each bubble cap, effecting a most intimate mixture between the gas and vapor and the liquid hydrocarbon.

While the bubble cap described is espe-

cially intended for use in hydrocarbon treatment apparatus, it will be understood that its use is not limited thereto, but may be employed in any apparatus where any gas or vapor is made to contact with a liquid.

Various changes in the construction and arrangement of parts may be made by those skilled in the art, without departing from the spirit of the invention as claimed.

I claim:

1. A bubble cap of the class described, made of a single sheet of metal having a pair of uprights diametrically arranged and extending from a perforated, circular, convex top.

2. A bubble cap of the class described, made of a single sheet of metal having a pair of uprights diametrically arranged and extending from a perforated, circular, convex top, the periphery of said top being serrated.

In testimony whereof I have signed my name to this specification.

JULIUS E. KOBERNIK.