

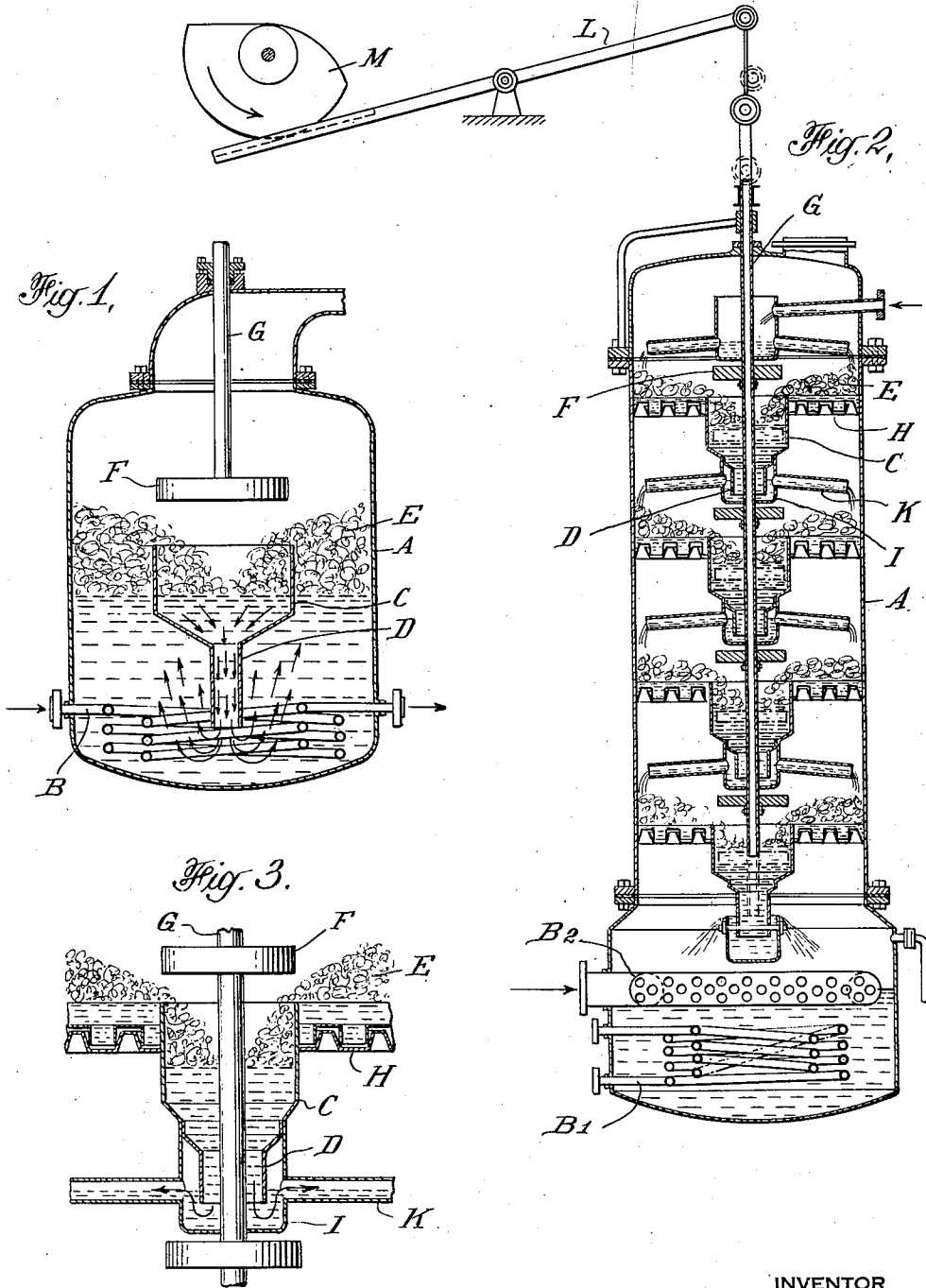
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DEVICE FOR BREAKING FROTH

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DEVICE FOR BREAKING FROTH

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This invention relates to a device for destroying the froth which forms in boiling, washing and distillation apparatus in the treatment of liquids with a relatively high viscosity. Devices for this purpose, such as rotating stirring arms, vertically movable grates, or plates formed with slots are known.

These known devices have the drawback that the destruction of froth and the desired mixing up of the liquid which forms from the froth with the remaining liquid does not take place in satisfactory manner.

The composition of the froth is in most cases not the same as that of the remaining liquid and when the liquid resulting from the froth remains on the surface of the remaining liquid, as takes place with the mentioned known devices, the froth forms again immediately and the desired mixing up with the liquid does not take place. The plates formed with slots which occupy the whole section of the apparatus moreover so reduce in many cases the section for the passage of the vapor, that an objectionable increase of the counter-pressure takes place.

These drawbacks are entirely avoided with the device according to the invention.

This device comprises a substantially vertical tube open at both its ends, the lower end of which is immersed in the liquid and into which the froth overflows at its upper end, and in a piston movable inside the tube, the uppermost position of which is above the tube, and which forces the froth downward and drives it back into the liquid.

The device fundamentally consists in a piston compressor. The space required is relatively small, so that the flow of the vapor is not checked. The complete destruction of even the smallest froth bubbles as well as a thorough mixing up of the liquid forming therefrom with the remaining liquid is obtained in satisfactory manner.

The device may be utilized with advantage in distillation columns in which foaming worts are treated.

For this purpose the overflows of these distillation columns are shaped as compression cylinders and the pistons of these cylinders, which are arranged one above the other, are affixed to a common movable rod.

The liquid is necessarily pumped through a column provided with the device, and the accumulations of liquid and froth which often take place and disturb the regular operation of the apparatus are avoided. In order to allow the froth time enough to overflow into the cylinder,

the piston should be present within the cylinder for a relatively small time only.

For this purpose the actuating device is so designed that it allows for a rest position of the piston in its uppermost position and that the downward movement of the piston takes place with high velocity. The effect of the leakage between the piston and the cylinder, which is determined by the play necessary for the practical execution, is thereby simultaneously lowered.

Figures 1 to 3 diagrammatically show examples of the device according to the invention. Figure 1 shows a device introduced into a boiling apparatus, whereas Figure 2 shows a device according to the invention in combination with a distillation apparatus with several rectification plates. Figure 3 shows on an enlarged scale one of the elements of the device according to Figure 2.

In Figure 1 the boiling apparatus A, which is heated by means of the heating coil B, contains a tube disposed vertically, open at both its ends and the lower part of which D is narrower than the upper part C. The tube dips into the boiling liquid. The froth E overflows into the tube. A reciprocating piston F gliding along the lateral wall of the upper part C of the tube forces at regular intervals the froth into the liquid. The piston is actuated by means of the rod G.

In Figures 2 and 3, A shows the external envelope of the distillation apparatus. B₁ and B₂ are heating coils. C is the overflow of the rectification plate H. The tubes C, D and I constitute together the liquid seal through which the liquid, distributed by the arms K, flows downwardly from the plate H to the next plate. The letters E, F and G have the same meaning as in Figure 1. The motion of the rod G takes place through the intermediacy of the arm L and the cam M. The bottoms of the tubes I are perforated to provide for the passage of the rod G.

I claim:

1. A device for destroying the froth which forms upon boiling and washing liquids, comprising a substantially vertical cylindrical tube open at its two ends, the upper end of which lies in the froth formation zone and the lower end in the liquid zone, a piston slidable along the inner surface of said tube, and means for so reciprocating the piston that its uppermost position lies above the tube.

2. A device for destroying the froth which forms upon boiling and washing liquids, comprising a substantially vertical cylindrical tube open at its two ends, the upper end of which lies in the

5 froth formation zone, a piston slidable along the inner surface of said tube, and a pipe open at its two ends, of smaller section than the aforementioned tube, forming a downward extension of said tube and having its lower end in the liquid zone and means for so reciprocating the piston that its uppermost position lies above the tube.

10 3. A device for destroying the froth which forms upon boiling and washing liquids, comprising a substantially vertical cylindrical tube open at its two ends, the upper end of which lies in the froth formation zone and the lower end in the liquid zone, a piston slidable along the inner surface of said tube, and means for so reciprocating the piston that its uppermost position lies above the tube in a rest position of said piston.

4. A device for distilling froth-forming liquids in a distillation column, comprising superposed distillation plates each of which is provided with an overflow shaped as a substantially vertical cylindrical tube, a substantially vertical rod running through said tubes along their common axis and to which are affixed pistons respectively slidable along the inner surfaces of the overflow tubes of the different distillation plates, and means for so reciprocating the rod that the uppermost position of each piston lies above the upper opening of the overflow of a distillation plate and the lowermost position of the piston inside said overflow.

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