

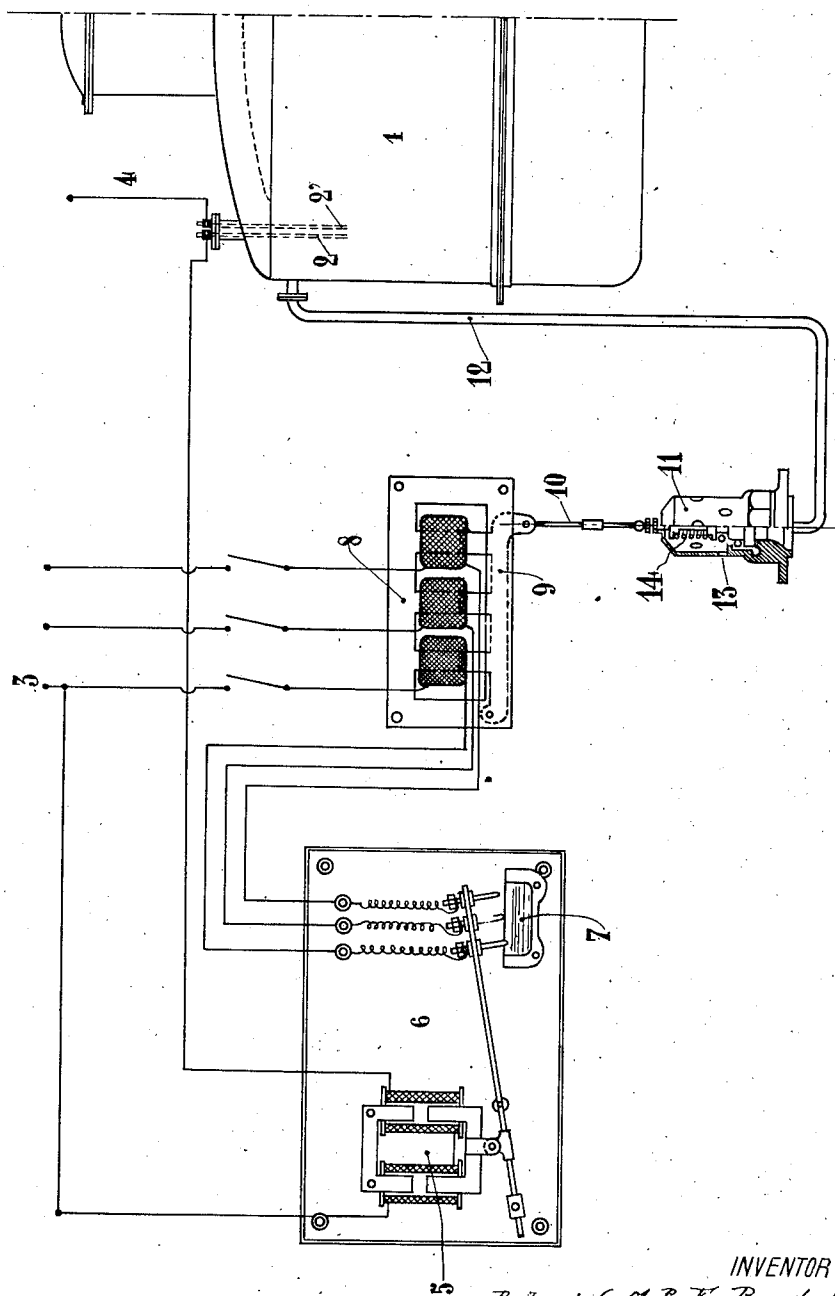
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FROTH BREAKING

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FROTH BREAKING

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9 Claims. (Cl. 183—2.6)

In the concentration or the distillation under high vacuum of liquids liable to froth, e. g. such as glycerines, difficulties are often set up by the production of froth. The operator is caught by the suddenness and extensiveness of such formation and cannot take instantaneous steps to remedy the situation. As a result the frothy liquid overflows, and the operator is compelled to slacken the process and operate with low levels for fear of such overflows.

This invention has for its object a device for automatically stopping such overflows which is applicable wherever electrically conductive liquids liable to froth during the process are to be treated in distillation or like apparatuses.

An embodiment of the new device is shown by way of example in the single figure of the appended drawing which is a diagram of the arrangement as applied in the distillation of glycerine under vacuum.

The invention consists essentially in that the distillation apparatus is provided with an air intake member operative through the medium of an electromagnet and relay system under the control of electrodes arranged within the distillation apparatus and responsive to the direct contact of the froth.

Arranged within the still 1 are a pair of stainless steel electrodes 2, 2' which are insulated both from each other and from the apparatus and connected in series between one phase 3 and the neutral or grounded lead of a three-phase distribution system. Connected in the same circuit is the electromagnet 5 of a relay 6 which through the medium of the three-pole mercury switch 7 is operative to open and close the circuit for an electromagnet 8 the armature 9 of which controls the shank 10 of an air control valve 11 connected through the pipe 12 with the still 1.

When the circuit for relay 6 is closed by the action of the electrically conductive froth contacting with the electrodes 2 and 2' in the still 1 operated under vacuum, the relay 6 operates the electromagnet 8 the armature of which actuates the valve shank 10, causing air to be admitted through the air intake apertures 13 and pipe 12; the effect of the air thus admitted, even in small amounts corresponding to a pressure variation of 0.5 cm. of mercury, is to immediately lay down the froth; the circuit then is open again and the valve is returned on its seat by the action of the spring 14.

It is to be noted that if the same operation were performed by hand it could not be instan-

taneous and the openings and closings of the valve would result in sudden rises and falls in vacuum whereby ever increasing difficulties would be experienced in resuming the process and the heating might even have to be discontinued; instead, the provision of the automatic device results in stilling even the wildest frothing through three or four air intakes, all manual attendance being dispensed with.

It is possible to combine the control of the air intake valve with the lighting of a lamp and the ringing of a bell.

I claim

1. In the method of vacuum treating a frothing liquid under sub-atmospheric pressure in a vacuum vessel, the steps of maintaining the liquid under a vacuum, and instantaneously and automatically increasing the pressure on the liquid when the froth of the liquid reaches a predetermined level in the vessel to break the froth.

2. In the method of vacuum treating a frothing liquid under sub-atmospheric pressure in a vacuum vessel, the steps of maintaining the liquid under a vacuum, and instantaneously and automatically admitting air to the vessel to increase the pressure therein when the froth reaches a predetermined level in the vessel to break the froth.

3. In the method of vacuum treating a frothing electrically conductive liquid under sub-atmospheric pressure in a vacuum vessel, the steps of maintaining the liquid under a vacuum, and electrically actuating an air control valve to effect an increase in pressure in the vessel when the froth rises to a level sufficiently high to form an electrically conductive path for the flow of electric current for actuating the air control valve to break the froth.

4. In an apparatus for the vacuum treatment of frothing liquids having a vessel and means for maintaining the vessel under a sub-atmospheric pressure, means for automatically preventing the froth formed on the liquid due to the sub-atmospheric pressure from reaching a determined level comprising a valve for controlling the drawing of air into the vessel, and means actuated upon the rise of froth to a predetermined level for opening the valve to permit air to be drawn into the vessel to increase the pressure and break the froth.

5. In an apparatus for the vacuum treatment of frothing liquids having a vessel and means for maintaining the vessel under a sub-atmospheric pressure, means for automatically pre-

- venting the froth formed on the liquid from reaching a determined level comprising means for controlling the pressure in the vessel, and means actuated upon the rise of froth to a determined level for operating the pressure controlling means to increase the pressure in the vessel to break the froth formed on the top of the liquid.
6. Apparatus for automatically stopping the rise of froth in vessels maintained under sub-atmospheric pressure for the vacuum treatment of frothing liquid, comprising a valve for placing the vessel, in which a vacuum is maintained, in communication with the atmosphere, and means actuated upon the froth reaching a predetermined level in the vessel for opening the valve to admit air to the vessel and thereby reduce the vacuum therein to break the froth formed on the liquid.
7. In an apparatus for the vacuum treatment of frothing electrically conductive liquids having a vessel and means for maintaining the vessel under a sub-atmospheric pressure, means for automatically preventing the froth formed on the liquid from reaching a determined level comprising an electrically actuated valve for controlling the drawing of air into the vessel, spaced electrodes at a determined level in the vessel electrically connected with the electrically operated valve, and adapted to complete an electric circuit through the froth when it rises to contact with the electrodes and thereby open the valve and break the froth formed on the liquid.
8. In an apparatus for the vacuum treatment of frothing electrically conductive liquids having a vessel and means for maintaining the vessel under a sub-atmospheric pressure, means for automatically preventing the froth formed on the liquid from reaching a determined level comprising a pair of electrodes in the vessel at a determined level adapted to be contacted by the froth to complete an electric circuit therebetween, an electric relay connected in circuit with the electrodes, and means actuated by the relay for instantaneously increasing the pressure in the vessel when the froth completes a circuit between the electrodes to break the froth.
9. In an apparatus for the vacuum treatment of frothing electrically conductive liquids having a vessel and means for maintaining the vessel under a sub-atmospheric pressure, means for automatically preventing the froth formed on the liquid from reaching a determined level comprising a pair of electrodes in the vessel at a determined level adapted to be contacted by the froth to complete an electric circuit therebetween, an electric relay connected in circuit with the electrodes, an electromagnetically actuated valve for controlling the pressure in the vessel, and means operated by the relay for energizing the electromagnetic valve to effect an increase in pressure in the vessel upon the completion of the electric circuit between the electrodes by the froth to break the froth formed on the liquid.
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