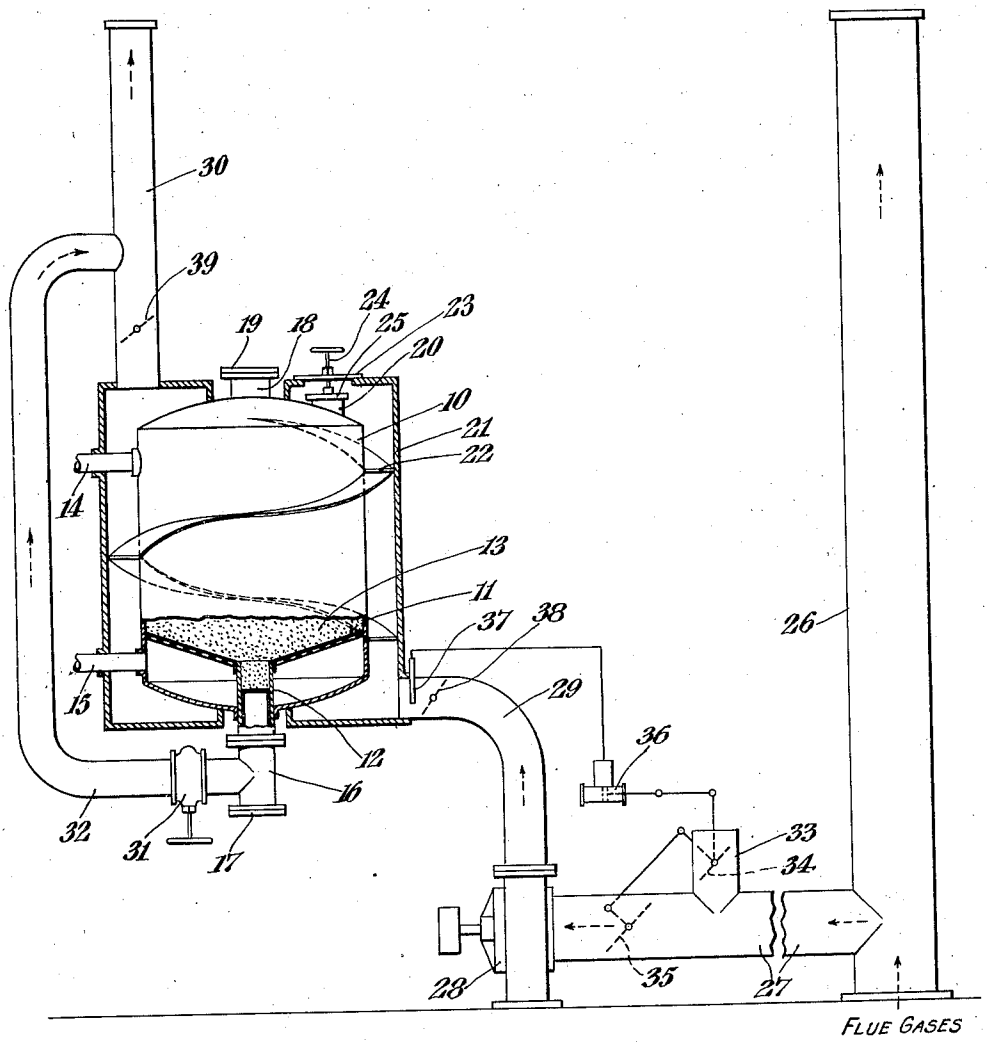
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APPARATUS FOR CONTACTING VAPORS WITH SOLIDS

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APPARATUS FOR CONTACTING VAPORS WITH SOLIDS

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This invention relates to an apparatus for contacting vapors with solids and has for an object an apparatus in which solid treating material may be heated to and maintained at any desired temperature. Such apparatus may be employed in the polymerization of the unstable, unsaturated hydrocarbons present in cracked hydrocarbon products by contact with an adsorptive catalyst.

According to the invention a treating tower is enclosed in a jacket and hot flue gases are supplied to the jacket from the cracking still. A spiral plate may be interposed between the treating tower and the jacket to cause the flue gases to circulate around the tower. Valves are provided whereby the flue gases may be passed through the treating tower. Means are also provided within the tower for supporting the treating material and for causing the vapor to be treated to pass through the treating material. Means also may be provided for regulating the temperature of the gases supplied to the jacket.

Other objects, novel features and advantages of this invention will be apparent from the following specification and accompanying drawing wherein the single figure discloses an apparatus embodying the invention.

10 is a treating tower having a funnel-like shelf 11 terminating in a discharge spout 12 projecting through the bottom of the tower. The shelf 11 comprises a perforated plate supporting a screen over which may be laid a layer of mineral wool so that the shelf is pervious to vapor but impervious to solids. Upon the shelf is supported a supply of treating material 13 which, for example, may be an adsorptive catalyst, such as fuller's earth or the like. Vapor conduits 14 and 15 are provided above and below the shelf 11 for supplying to and removing from the treating tower vapor which is passed through the treating material. To the lower end of the spout 12 is connected a T 16, the lower end of which is closed by cap 17. In the cover of the tower is provided a manhole 18 closed by a cover 19. Also in the cover is provided a port 20.

Surrounding the tower 10 is a casing or jacket 21 between which and the tower is interposed a spiral plate 22. In the top of the casing is an aperture in alignment with the port 20, the aperture being closed by a plate 23 which supports a valve stem 24. To the lower end of the valve stem is attached a cap 25 adapted to close the port 20.

26 is the stack of a cracking still or the like and from a point near the bottom thereof a flue 27 leads to the inlet of a pump 28, the outlet of which communicates through flue 29, with the bottom of the jacket 21. The stack 30 leads from the top of the jacket 21. The lateral port of the T 16 communicates through a valve 31 with the flue 32 which leads into the stack 30. The flue 27 is provided with a cold air inlet 33, controlled by a damper 34, which is linked to a damper 35 in the flue 27. These dampers are regulated by an automatic damper control 36 operatively connected to a thermometer 37 arranged at the inlet of flue 29 to the jacket 21. A manually operated damper 38 is also provided in the flue 29 and a similar damper 39 is provided in the stack 30.

Before admitting to the tower 10 vapor to be treated by the treating material contained therein, the latter may be heated to any desired temperature. This is accomplished by closing the damper 39, lifting the cover 25 from the port 20 and opening the valve 31. The flue gases are led around the tower and then pass through the port 20 into the tower and escape by way of the spout 12 and flue 32 to the stack 30. After the treating material has been sufficiently warmed, the port 20 and valve 31 are closed and the damper 39 opened. The flue gases continue to circulate around the tower and escape from the jacket by way of the stack 30. The temperature at which the flue gases are supplied to the tower is regulated by means of the dampers 34 and 35 which are operated through the control 36 in response to temperature at the thermometer 37.

A spiral plate ensures a rifled circulation of the hot gases and prevents short-circuiting of the flow around the tower. The valves in the tower permit passing the hot gases through the treating material before commencing a run and allow the gases which

have passed through the treating material to escape without going through the finished product. The temperature of the treating material is accurately controlled and excessive condensation in the body of the treating material in the early part of a run is prevented. By drawing the spent combustion gases from the stack of the still or cracking unit with which the tower is being operated the heat can be obtained at negligible cost. While in this application the hot gases have been shown as derived from a cracking unit, it is of course apparent that they may be obtained from any convenient source or from a source especially provided.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a closed treating tower, means for passing vapor through said tower, a vapor pervious shelf in said tower terminating in a discharge spout, a jacket surrounding said tower, said jacket having an inlet and an outlet whereby hot gases may be circulated around said tower, means for supplying hot gases to said inlet, a port in said tower, a cover therefor movably supported by and operable from the exterior of said jacket and a valve connected to said spout, said port and valve permiting the passage of hot gases through the tower.

2. In combination, a closed treating tower, fluid-permeable supporting means within said tower, means for passing vapor through said means and a bed of treating material supported thereby, a jacket surrounding said tower, an inlet and an outlet for said jacket whereby hot gases may be circulated around said tower, valve controlled means for admitting heating gases from said jacket into said tower, and a valve controlled outlet for discharging heated gases from said tower.

3. In combination, a closed treating tower, fluid-permeable supporting means within said tower, means for passing vapor through said means and a bed of treating material supported thereby, a discharge spout leading from said supporting means, a jacket surrounding said tower, an inlet and an outlet for said jacket whereby heating gases may be circulated around said tower, valve controlled means for admitting heating gases from said jacket into said tower, and a valve controlled vent from said spout for discharging said gases from said tower.

4. In combination, a closed treating tower, fluid-permeable supporting means within said tower, means for passing vapor through said means and a bed of treating material supported thereby, a discharge spout leading from said supporting means, a jacket surrounding said tower, an inlet and an outlet for said jacket whereby heating gases may be circulated around said tower, valve controlled means for admitting heating gases from said jacket into said tower, and a valve controlled conduit leading from said discharge spout to the outlet from said jacket.

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

WALTER MILLER.