June 11, 1963 C. LOWERY 3,093,267

DUAL CHEMICAL DISPENSER

Filed May 16, 1960

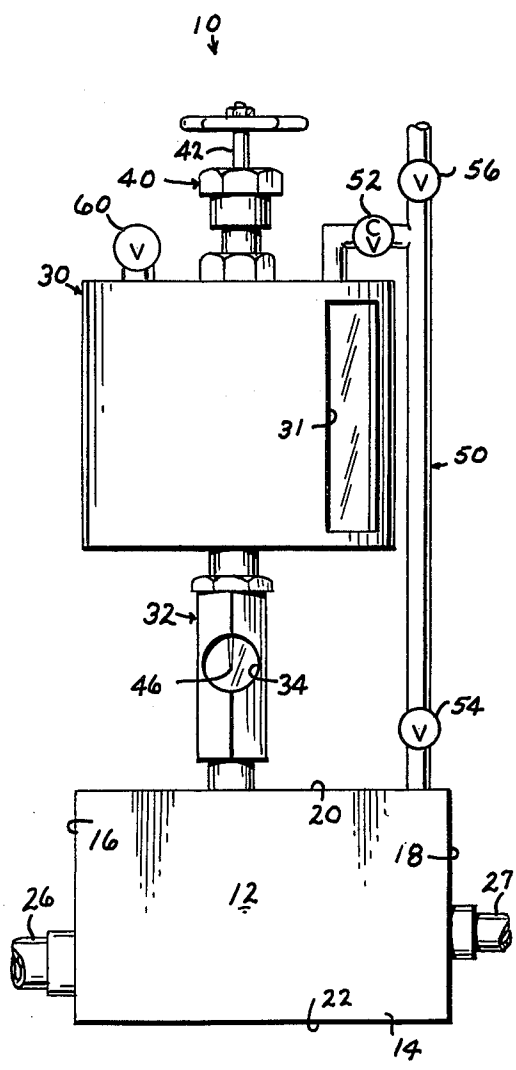


FIG. 1

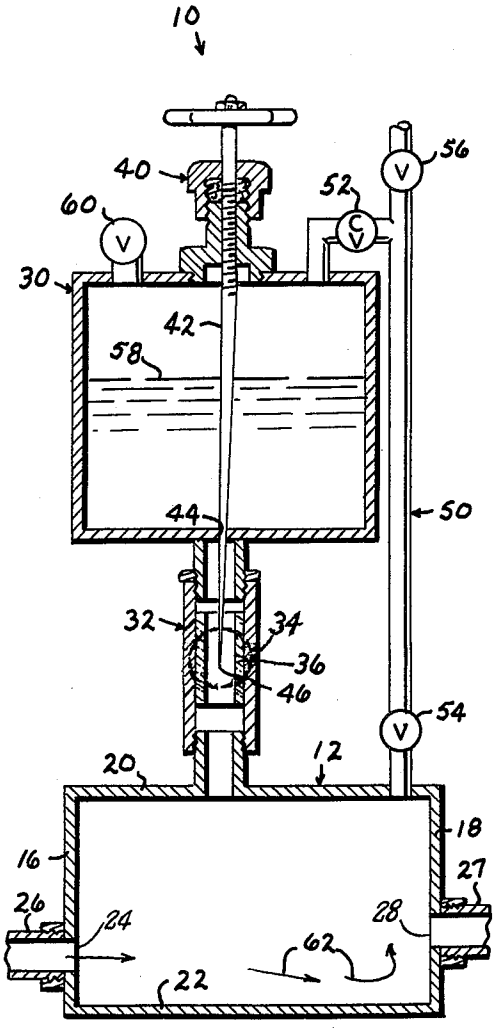


FIG. 2

Charley Lowery

INVENTOR.

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DUAL CHEMICAL DISPENSER

Charley Lowery, Rte. 8, Box 186, Oklahoma City, Okla.

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The present invention relates to oil production and more particularly to a means for treating crude oil.

Since crude oil contains paraffin, it is desirable to provide a means of mixing an oil treating chemical with the crude oil at a point adjacent the producing well so that the paraffin or basic sediment will settle out within the settling tank to be drawn off with salt water, if the well produces any of the latter.

It is, therefore, the principal object of the instant invention to provide a means for injecting an oil treating compound into the crude oil flow line.

Another object is to provide a chemical injector and dispenser which includes a fluid mixing chamber adapted to be interposed in the flow line for thoroughly mixing the treating compound with the crude oil.

Another object is to provide a chemical injector for crude oil lines by which gas pressure in the oil line may be admitted to the chemical containing chamber to force-feed the chemical into the flow line.

Another object is to provide a chemical injector which may be connected with an independent source of gas under pressure to force-feed the chemical into the flow line.

Still another object is to provide a chemical injector wherein the rate of gravity flow or force-fed chemical may be visualized as the same enters the flow line.

The present invention accomplishes these and other objects by providing a fluid mixing chamber adapted to be interposed between and connected to the ends of a crude oil flow line. A chemical reservoir is mounted above the fluid mixing chamber and is interconnected therewith by a tubular member. Valve means carried by the reservoir includes an elongated downwardly tapered stem which projects through a suitable opening in the lower surface of the reservoir and terminates medially the ends of the connecting tubular member behind a transparent window. Other tubular means interconnects the upper surface of the mixing chamber and the reservoir to provide communication between the two.

Other objects will be apparent from the following description when taken in conjunction with the accompanying single sheet of drawings, wherein:

FIGURE 1 is an elevational view of the device connected with a fragment of a flow line; and,

FIGURE 2 is a vertical cross-sectional view, partly in elevation, of the device.

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 10 indicates the device, as a whole, comprising a mixing chamber 12, preferably rectangular in general configuration, having opposing side walls 14 and ends 16 and 18 interconnected by a top 20 and a bottom 22. An opening 24 is formed in the end 16, adjacent the bottom 22, for connection with one end of a pipe line 26. A second opening or aperture 28, formed in the opposing end wall 18 horizontally spaced above the axis of the opening 24, is adapted to be connected to the other end 27 of the pipe line.

A hollow cylindrical-like chemical container or reservoir 30 is positioned above the mixing chamber 12 and is connected thereto by a first tubular member 32 extending between the two. A transparent window 31 is preferably formed in the side wall of the chamber 30 to visually determine the quantity of chemical therein.

The tubular member 32 is provided with oppositely disposed openings 34, in its side wall, which are sealed by transparent material, such as glass 36 or the like, thus providing a transparent window medially the ends of the tubular member 32.

Valve means 40 is connected to the top wall of the chemical reservoir 30 and includes a threadedly engaged elongated stem portion 42 which projects downwardly through the chemical container 30 and through an opening 44 formed in the lower surface of the container and terminates in a sharpened or tip end 46 medially the ends of the tubular member 32. The opening 44 forms a seat with which the valve stem 42 is adapted to seal on downward movement of the stem 42 to interrupt chemical flow into the mixing chamber 12 through the tubular member 32.

A second tubular member 50 extends between and is connected to the upper surface of the mixing chamber 12 and chemical container 30 for communication in one direction between the two. A check valve 52, interposed in the line 50, prevents reverse flow through the member 50. A valve 54 opens and closes the line 50. Another valve 56, connected to the line 50, permits injecting a gas under pressure into the chamber 30 when the valve 54 is closed for the purposes which will presently be apparent.

Operation

In operation the mixing chamber 12 is interposed between the ends 26 and 27 of a pipe line and a quantity of chemical 58 is placed within the reservoir 30 through a suitable inlet valve means 60. The valve stem 42 is raised slightly to permit the chemical 58 to pass through the opening 44 by gravity. The chemical 58 flows down the periphery of the stem 42 and drips off of the tip end 46 which rate of dripping can be visualized through the glass covered opening 44. The crude oil, not shown, enters the mixing chamber through the opening 24 and leaves the mixing chamber through the opening 28. The horizontal spacing of the outlet 28, above the inlet, results in imparting a churning action to the crude oil, as indicated by the arrows 62, thus thoroughly mixing the chemical with the oil. Gas under pressure, produced by the well, may accumulate within the upper portion of the mixing chamber and hamper the gravity flow of the chemical 58. This gas pressure can be admitted to the upper portion of the chamber 30 by opening the valve 54 then by closing the valve 54 and the gas pressure in the chamber 30 may be utilized to increase or resume the rate of flow of chemical into the mixing chamber when the gas is reduced therein by flowing out through the outlet 28 with the oil. Alternatively a gas under pressure from a source of supply, not shown, may be connected to the valve means 56 to maintain the chemical 58 under pressure to force-feed the chemical into the mixing chamber against constant pressure maintained by the flow of gas and crude oil through the mixing chamber.

Obviously the invention is susceptible to some change or alteration without defeating its practicability, and I therefore do not wish to be confined to the preferred embodiment shown in the drawings and described herein, further than I am limited by the scope of the appended claims.

I claim:

1. A chemical dispenser, comprising: a fluid mixing chamber adapted to be interposed in a crude oil flow line; a chemical reservoir arranged above said mixing chamber, said chemical reservoir having an opening providing a valve seat in its lower wall; a tubular member interposed between and connected with said mixing chamber and said chemical reservoir around the valve seat in the latter; and valve means connected with the top wall

of the chemical reservoir, said valve means having an elongated downwardly tapering stem passing through said opening and terminating within said tubular member and adapted to seal with said valve seat for regulating the flow of chemical from said reservoir.

2. A chemical dispenser, comprising: a fluid mixing chamber having an inlet port in its side wall adjacent its lowermost surface for connection with a crude oil line, said mixing chamber having an outlet port in its wall opposite said inlet port in a plane spaced horizontally above the plane of the inlet port for connection with a crude oil line; a chemical reservoir disposed above said mixing chamber, said chemical reservoir having an opening in its lowermost wall forming a valve seat; a first tubular member extending between and connected with said mixing chamber and said chemical reservoir around the opening in the latter for fluid communication between the two, said first tubular member having a transparent window medially its ends; valve means connected to the top wall of the chemical reservoir, said valve means having an elongated downwardly tapered stem terminating medially the ends of said first member and adapted to open and close the opening in said chemical reservoir; a second tubular member extending between and connected with the upper walls of said mixing chamber and said chemical reservoir for communication between the two; and valve means interposed in said second tubular member for controlling communication therethrough.

3. A chemical dispenser, comprising: a fluid mixing chamber having inlet and outlet ports in its opposing side walls adjacent its lowermost surface for connection with a crude oil line; a chemical reservoir disposed above said mixing chamber, said chemical reservoir having an opening in its lowermost wall forming a valve seat; a tubular member extending between and connected with said mixing chamber and said chemical reservoir around the opening in the latter for fluid communication between the two, said tubular member having a transparent window medially its ends; and valve means connected to the top wall of the chemical reservoir, said valve means having an elongated downwardly tapered stem passing through said opening and terminating medially the ends of said tubular member and adapted to open and close the opening in said chemical reservoir.

4. A chemical dispenser, comprising: a rectangular fluid mixing chamber having an inlet port in one side wall and an outlet port in its opposing side wall spaced horizontally above the inlet port for connecting said chamber between the ends of a crude oil flow line; a

chemical reservoir disposed above said mixing chamber, said reservoir having an opening in its lowermost wall forming a valve seat, said reservoir having a glass closed window in its side wall; a first tubular member extending between and connected with said mixing chamber and said reservoir around the opening in the latter for fluid communication between the two, said first tubular member having a glass closed window in its wall medially its ends; a first valve connected to the top wall of the chemical reservoir, said first valve having an elongated valve stem extending downwardly through said reservoir and terminating medially the ends of said first tubular member, said valve stem being adapted to seal with said valve seat for regulating the release of chemical from said reservoir; a second tubular member extending between and connected with the respective upper walls of said mixing chamber and said reservoir for admitting gas under pressure to said reservoir; and valve means interposed in said second tubular member for opening and closing the latter.

5. A chemical dispenser as claimed in claim 4 wherein said valve stem is gradually tapered to a point at its lower end whereby chemical from said reservoir may be dispensed dropwise through said opening and off the pointed lower end of said valve stem.

6. A chemical dispenser as claimed in claim 4 and further characterized to include conduit means connected to said second tubular member between said valve means and said reservoir and adapted for connection to a source of a gas under pressure whereby a chemical in said reservoir may be forced through said opening.

7. A chemical dispenser as claimed in claim 4 wherein the inlet and outlet ports in said mixing chamber are positioned in the lower portion thereof whereby gas in said crude oil may accumulate in the upper portion of said mixing chamber above oil in the lower portion thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,272,888	Baluta	July 17, 1918
1,322,559	Gethman	Nov. 25, 1919
1,424,104	Joy	July 25, 1922
2,207,761	Sayles	July 16, 1940
2,227,646	Hillmann	Jan. 7, 1941
2,578,994	Dunaway	Dec. 18, 1951

FOREIGN PATENTS

1,097,262	France	Feb. 16, 1955