

Dec. 30, 1930.

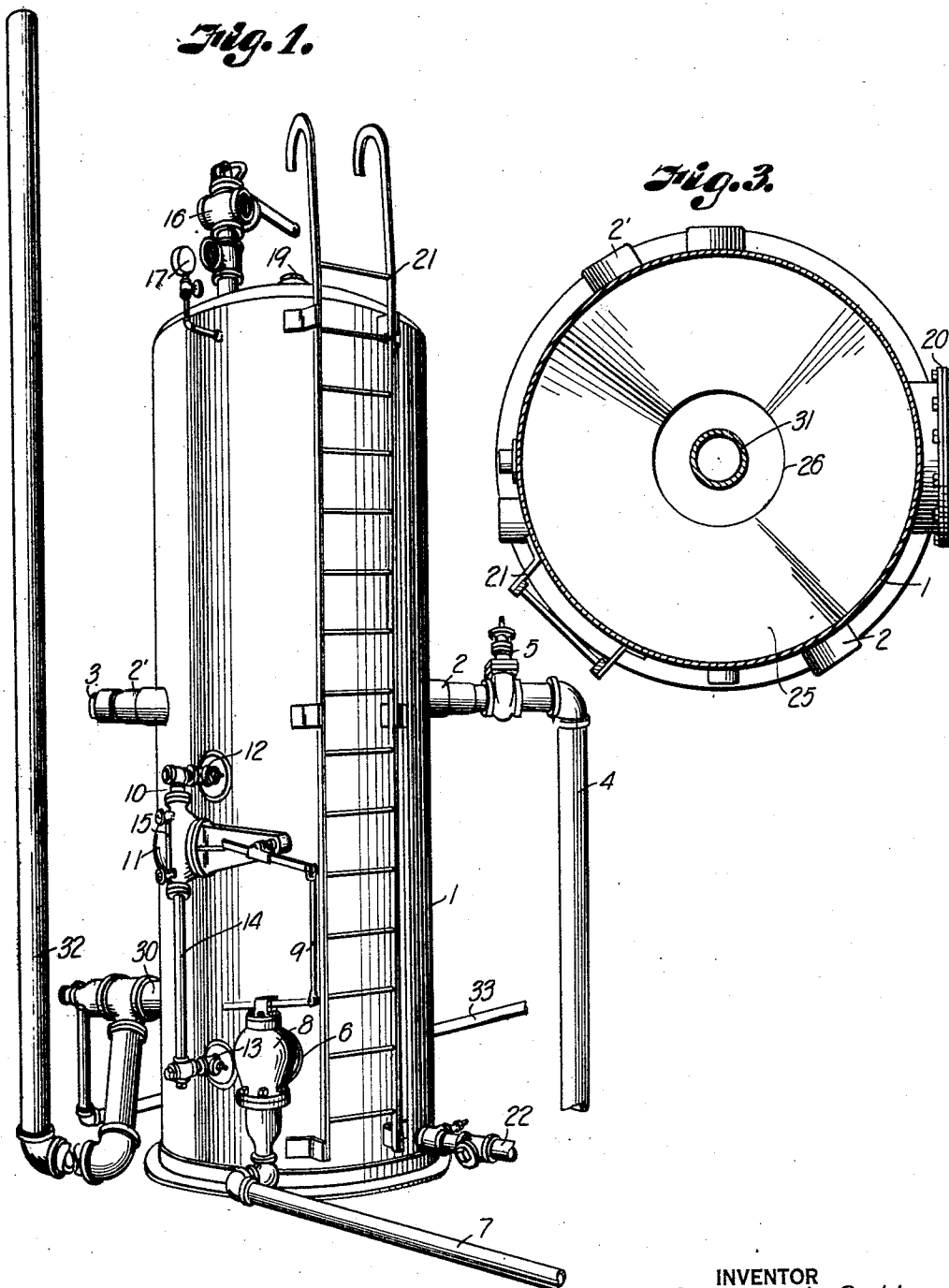
C. L. SUTTON

1,786,790

SEPARATOR

Filed Feb. 11, 1928

2 Sheets-Sheet 1



INVENTOR
Clarence L. Sutton
BY *Arthur C. Brown*
ATTORNEY

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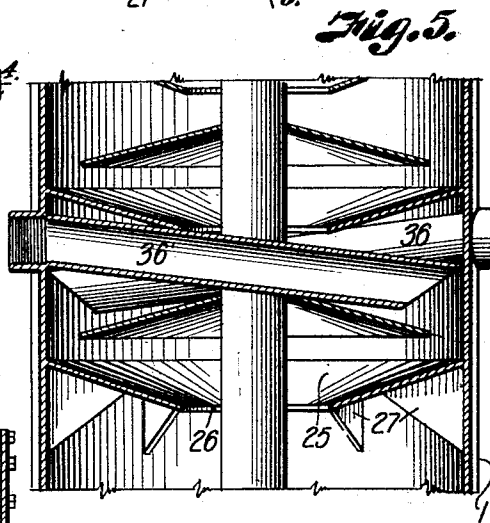
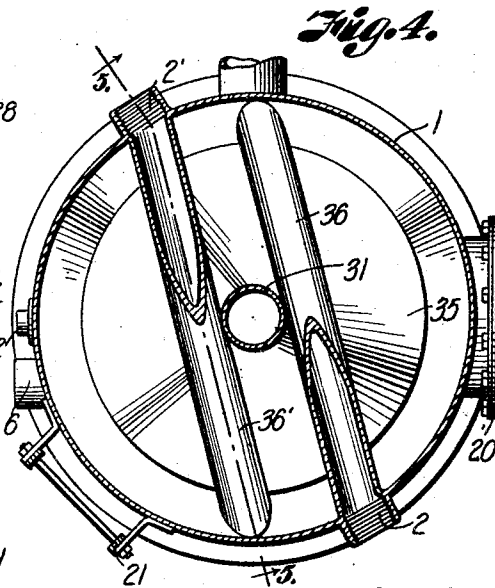
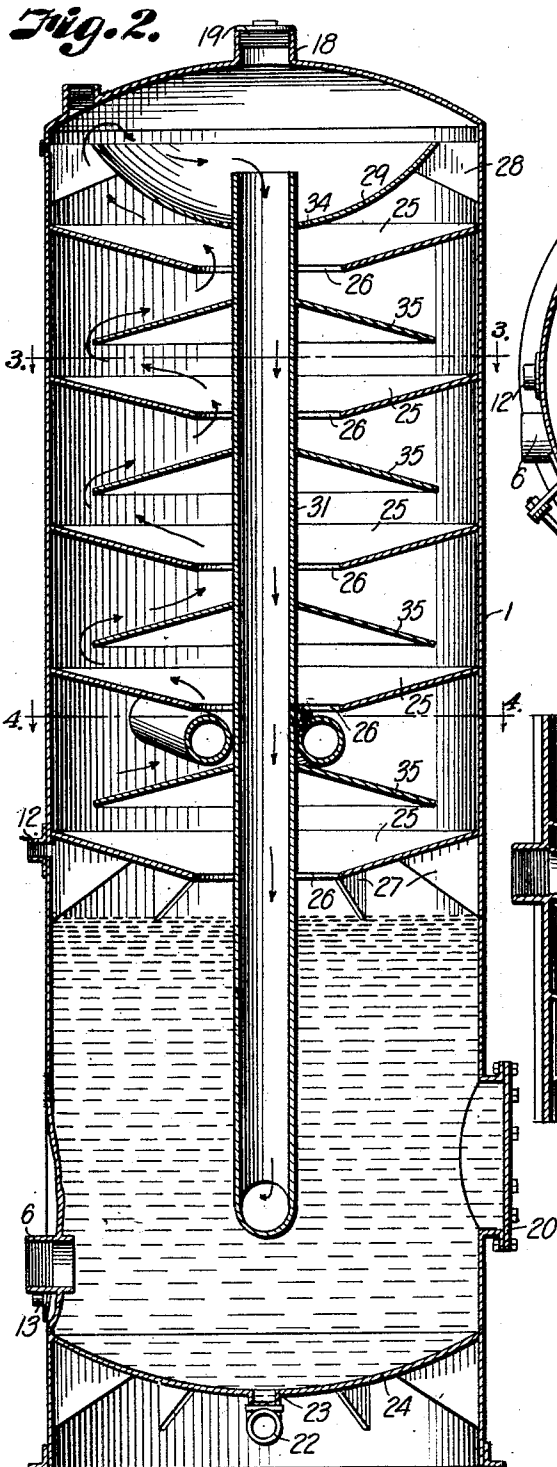
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UNITED STATES PATENT OFFICE

CLARENCE L. SUTTON, OF TULSA, OKLAHOMA

SEPARATOR

Application filed February 11, 1928. Serial No. 253,653.

My invention relates to separators and more particularly to a device of that character for separating the oil and gas delivered together from an oil well under natural or artificial pressure or by mechanical pumping; the principal object of the invention being to effectually separate the gas and liquid components of the product of the well so that the liquid petroleum may be run to storage and the relatively dry gas delivered directly to service lines or through compressors for recovery of gasoline content.

In accomplishing this object I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is an exterior perspective view of a separator containing my improvements, including conventional equipment.

Fig. 2 is a central vertical section of the separator tank, illustrating the details of construction constituting my invention.

Fig. 3 is a cross section on the line 3—3, Fig. 2.

Fig. 4 is a cross section on the line 4—4, Fig. 2.

Fig. 5 is a cross section on the line 5—5, Fig. 4.

Referring more in detail to the drawings:

1 designates a tank, of conventional form and dimensions, equipped with the usual diametrically opposite intake fittings 2—2' at about its vertical center, one of which is shown closed by a plug 3 and the other connected with a supply line 4 which may lead from a well and is equipped with a flow controlling gate valve 5.

Leading from a fitting 6 near the bottom of the tank is an oil line 7, equipped with a valve indicated by the housing 8, which is automatically controlled through linkage 9 by float mechanism 10, indicated by the housing 11, having communication with the tank through upper and lower fittings 12 and 13 and a pipe 14, whereby the line 7 is opened and closed to permit flow from the tank when the tank has filled to the level of the outlet fitting 12. 15 designates a sight gauge on the float housing through which level of liquid in the tank may be observed, 16 a safety

blow-off valve and 17 a pressure gauge at the top of the tank; 18 a vent opening in the top of the tank, normally closed by a screw plug 19, 20 a manhole in the side of the tank, 21 a ladder providing access to the top of the tank, and 22 a drain line leading from a sump 23 on the dished bottom 24 of the tank (Fig. 2). All of the above parts are of usual construction and, forming no part of my invention, are mentioned only for better understanding of my improvements, which I will now describe.

Welded or otherwise securely attached to the inner face of the body of the tank in close relation to said body and in spaced relation to each other, are a number of baffle rings 25, inclined downwardly to respective central drain apertures 26, the outer, upper rim of the lowest ring being above the upper float control fitting 12 and said ring being braced by brackets 27 on the tank wall for a purpose presently apparent.

Suspended on brackets 28 on the upper portion of the tank wall is a bowl-shaped trap 29 of substantially less diameter than the interior diameter of the tank to permit free passage of gas between the rim of the trap and wall of the tank into the dome of the tank.

Extending through the side wall near the bottom of the tank is a fitting, indicated by the pipe section 30, and connected with said fitting and extending upwardly at the center of the tank centrally through the drain apertures 26 of the baffle rings 25 and through the bottom of the trap 29 is a line 31 through which gas collected in the dome of the tank is forced to the flow line 32 or the branching local supply line 33. The line 31 is of substantially less diameter than the apertures 26 to permit free drainage of liquid downwardly through the apertures and upward flow of gas therethrough, the line terminating slightly above the bottom of the trap and the latter being provided with drain apertures 34 in a circular series about the line.

Welded, or otherwise secured to the line 31, between the rings 25 are downwardly and outwardly inclined baffle cones 35 which ter-

minate in spaced relation to the wall of the tank to effect drainage of liquid onto the baffles 25 and rise of gas in a tortuous path through and about the respective baffles of the oppositely arranged sets.

5 Connected with each of the supply fittings 2'—2' is a nozzle 36'—36' which extends downwardly over the lowermost baffle cone 35 and terminates in a downwardly directed beveled mouth at the side of the tank opposite
10 its entry thereto, so that fluid is delivered from the nozzles or either of them onto the lowermost ring 25 to flow through the central drain aperture of said ring into the bottom of the tank.

15 Assuming the tank to be constructed and assembled as described, oil and entrained gas delivered from the well is discharged from the nozzles 36'—36' or either of them, into the tank above the lower ring 25, the oil and
20 gas separating when released to the zone of greater area in the tank, the liquid all flowing down the baffle 25 into the bottom of the tank and the gas issuing in the tortuous path about and through the baffles indicated by the
25 arrows (Fig. 2). When the gas first separates from the oil it is highly saturated but gives up the moisture as it rises, the precipitated oil collecting on and flowing back over the respective baffles to the bottom of the tank,
30 the gas finally reaching the dome of the tank in substantially dry condition and from there being forced by its own pressure down the line 31 to outlet in the flow line 32. Any
35 moisture reaching the trap 29 is drained back through the apertures for flow back with the liquid accumulated on the lower baffles.

What I claim and desire to secure by Letters Patent is:

40 A separator of the character described comprising a tank having a closed top, a series of baffle rings having outer peripheries sealed to the wall of the tank and inner peripheries forming an axial passage in the tank for
45 restricting flow of fluid over said inner peripheries, a trap at the top of the tank spaced from the wall thereof, a gas outlet pipe in said passage spaced from the inner peripheries of the rings and having a gas
50 inlet and extended into the trap, said pipe having an outlet adjacent the lower end of the tank, and an inlet nozzle for mixed oil and gas arranged to discharge adjacent the outer periphery of the lowermost of said
55 baffle rings.

In testimony whereof I affix my signature.
CLARENCE L. SUTTON.