

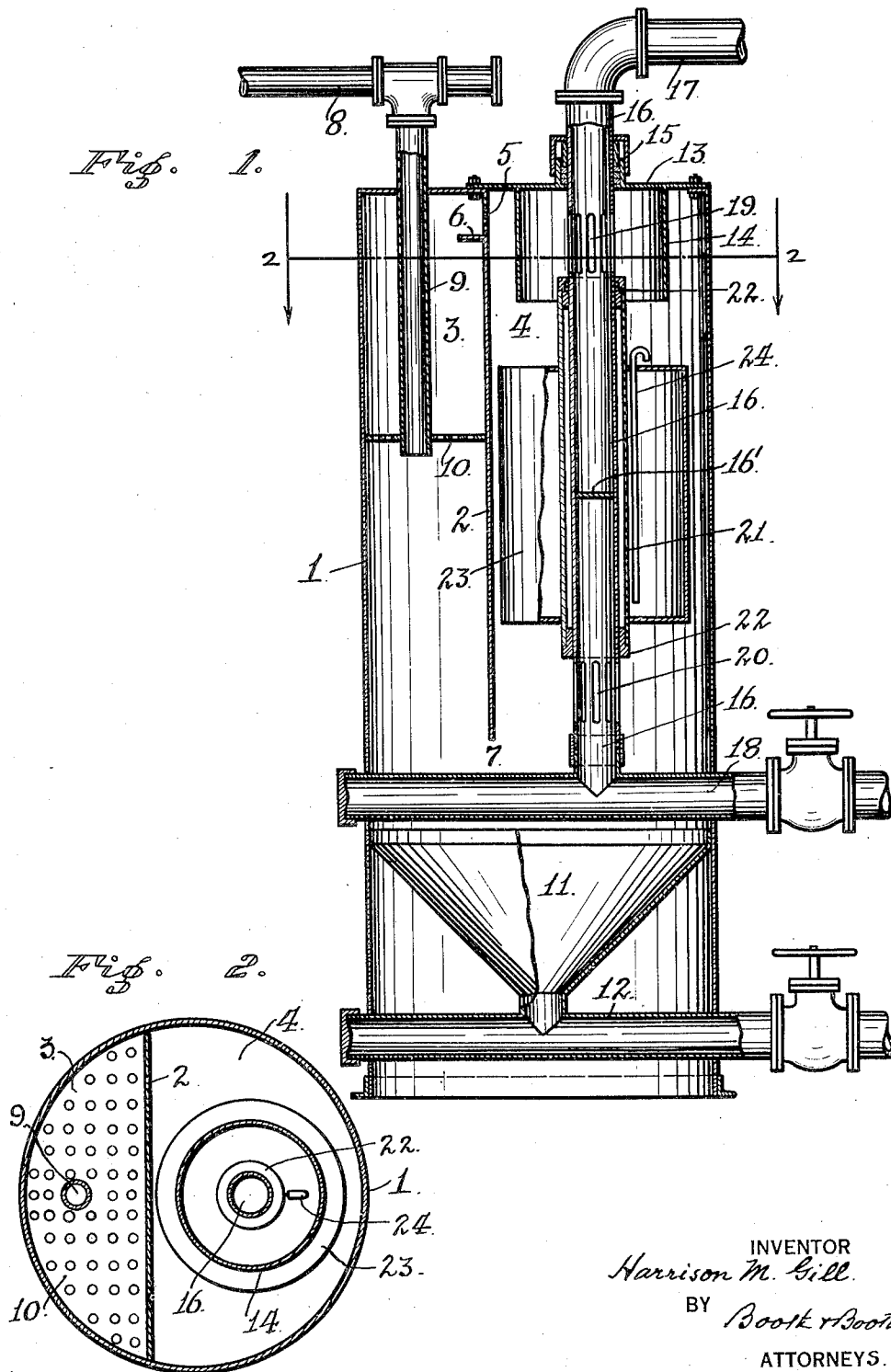
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1,535,721

H. M. GILL

GAS, OIL, AND SAND SEPARATOR

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GAS, OIL, AND SAND SEPARATOR.

Application filed November 3, 1924. Serial No. 747,571.

To all whom it may concern:

Be it known that I, HARRISON M. GILL, a citizen of the United States, residing at Taft, in the county of Kern and State of California, have invented certain new and useful Improvements in Gas, Oil, and Sand Separators, of which the following is a specification.

My invention relates to that type of an apparatus for separating gas, sand and water from oil as it comes from a producing oil well, disclosed by my Patent No. 1,490,462 dated April 15, 1924, to which reference may be had for a more complete understanding of my present invention, which consists in a constructive improvement upon said former apparatus.

The object of my invention is to constructively simplify the separator, both in form and cost of manufacture, while retaining all the desirable functions of the former device.

The nature of my present improvement will be fully ascertained and pointed out in the following specification and claims, reference being had to the accompanying drawings in which—

Fig. 1 is a vertical sectional elevation of my separator.

Fig. 2 is a cross section on the line 2—2 of Fig. 1.

1 is a shell, which, by means of a plate 2 suspended therein and terminating above its bottom, is divided into two chambers 3 and 4, which chambers may be termed respectively, the initial separating chamber and the float chamber.

These two chambers communicate above through openings 5, in the dividing plate 2, the openings being guarded by a baffle flange 6 just below them. They also communicate below at 7 under the foot of the dividing plate 2. 8 is the pipe line leading from the well, and entering by means of an inlet pipe 9, through the top of the shell 1 into the initial separating chamber 3 into which it extends a short distance as shown, its lower end opening through a perforated baffle plate 10.

In the lower portion of the shell 1 is fitted the hopper-like settling member 11, which opens below to a controllable discharge connection 12, fitted across and emerging from the shell. The top of the shell 1 over the float chamber 4 consists of a removable head cap 13 having a depending flange 14, which

functions as a baffle as will presently be explained.

Fitted to the head cap 13 by means of a suitable stuffing box 15 is a pipe 16, the upper exterior end of which connects with the gas discharge line 17. This pipe 16 extends downwardly in the float chamber 4 to its lower end, where it communicates with a controllable oil discharge connection 18 fitted across and emerging from the shell 1.

The pipe 16 is provided with a plug or partition 16' which divides its interior into separate upper and lower portions. In the upper portion of the pipe and within the area circumscribed by the baffle flange 14 are the elongated ports 19, and in the lower portion of said pipe are similar elongated ports 20, said ports providing respectively for the entrance of the gas from the chamber 4 into the pipe 16 above the plug 16', and the entrance of the oil from said chamber into the pipe below said plug.

A sleeve valve 21 is slidably fitted upon the pipe 16 and has closely fitting end collars 22. The upper collar of the sleeve valve is adapted to control the upper ports 19 and the lower collar to control the lower ports 20 of said pipe.

A float 23 is carried by the sleeve valve 21. 24 indicates a vent tube for the float.

The operation of the separator is substantially the same as the operation of the device of my patent above referred to. The mixed oil, gas, sand and water coming from the well through the pipe 8 is discharged into the initial separating chamber 3. The sand and water settle in the hopper-like member 11 in the lower part of the shell and may be drawn off, at suitable intervals, through the controllable discharge connection 12.

The gas rises to the upper portion of said chamber 3, and passes through the openings 5 in the upper part of the dividing plate 2, into the float chamber 4.

The oil which occupies the lower portion of the chamber 3, passes under the dividing plate 2 into the lower portion of the chamber 4. The float 23 is carried by the oil, following its level and thus moving the sleeve valve 21 up or down. If an excess of oil comes into the float chamber 4, the float 23 rises, and the upper collar 22 of the sleeve valve 21 restricts or closes the upper or gas discharge ports 19 until the increasing volume and pressure of gas within the

chamber 4 forces the excess oil out through the lower or oil discharge ports 20, thereby lowering the oil level in the chamber and permitting the float 23 to descend. On the other hand, if an excess of gas, in proportion to oil, comes into the chamber 4, the oil level therein drops, causing the float to descend until the lower collar 22 of the sleeve valve 21 restricts or closes the oil discharge ports 20, thereby permitting the oil level to again build up.

The function of the baffle flange 14 of the head cap 13 of the float chamber is to turn the gas entering chamber 4 downward before discharging through the upper ports 19.

It will be seen that in the present improvement, as compared with my former device, I have consolidated the separating and float chambers in a single shell, by means of the dividing plate 2 and have preserved by the construction and disposition of said dividing plate, the necessary separate communications between said chambers. Also, by the construction and relative arrangement of the several controllable discharges, and the flanged head cap 13 for the float chamber I have simplified the device into a unitary structure, in harmony with good constructive practice and economy in manufacture.

I claim:

A gas and oil separator comprising a closed shell divided interiorly into separate chambers; an inlet connection for receiving in the first of said chambers a mixture of gas, oil, sand and water as it comes from a well; an outlet connection from said shell for discharging therefrom the sand and water settling therein, said chambers having communications adapting the gas and oil to separately pass from the first chamber into the upper and lower areas respectively of the second chamber; a pipe within the second chamber having an upper port and a lower port communicating with the upper and lower areas respectively of said second chamber, said pipe between the ports being interiorly divided; a delivery pipe from each end of said ported pipe; a sleeve valve slidably fitted upon said ported pipe and adapted to reciprocally proportionally control the ports thereof; a float carried by said sleeve valve; and a removable head cap of the shell covering the second chamber, and provided with a downwardly extending baffle flange surrounding the upper ports of said pipe.

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

HARRISON M. GILL.