To all whom it may concern:

Be it known that I, HERBERT WIRSHING, a citizen of the United States, and a resident of Tulsa, in the county of Tulsa, State of Oklahoma, have invented new and useful Improvements in Gas and Oil Separators, of which the following is a specification.

My invention relates generally to means for separating oil and gas, and more particularly to a form of separator adapted for use at flowing oil wells, the object being to provide a simple and effective means for separating the gas from the oil which flows from the well so that the gas may be utilized for the purpose of drilling other wells, or for other commercial purposes.

It has heretofore been the custom at oil wells, when separating the gas from the oil for the above purpose, to trap the oil which fills the bottom of a tank and to discharge the gas from the top of the tank. I have, however, provided an improved means for this purpose which will be clearly understood from the disclosure of my improvements as shown in the accompanying drawings forming a part of this application, in which I have illustrated a single practical embodiment of my invention, subject to modification within the scope of the appended claim, without departing from the spirit of my invention.

In said drawings:

Fig. 1 is a side elevation of my separator.
Fig. 2 is an elevation at right angles thereto.
Fig. 3 is a sectional plan of the same.
Fig. 4 is a reduced elevation of the separator in connection with a flow tank for receiving the oil.

As constructed in the drawings, A represents a vertical casing of substantial height having end closures 1 and 2 at the top and bottom, respectively, an oil inlet 3 at the bottom, an oil outlet 4 at a point near its lower end, and a gas outlet 5 at the top.

B represents a vertical section of pipe through which the oil and gas from a well is conducted to the casing A above the normal level of oil in said casing, said pipe having a horizontal section 6 with a depending nozzle 7 thereon for discharging the oil and gas into the casing, as shown in Fig. 1.

Pipe B connects with a main pipe 8 at the bottom, and a valve V is interposed therein between pipe B and casing A for admitting the oil to casing A when the same is not being used as a separator. Said valve is normally closed so as to direct the flow of oil into the upper portion of casing A.

A back pressure valve b is attached to the oil outlet 4 of casing A and to a discharge pipe 9 which conducts the oil from the casing to a flow tank T at any point convenient to the separator. Said back pressure valve serves to retain a required pressure in the casing A for conducting the gas to a point of utilization.

The gas from the separator casing is discharged through the outlet 5 at the top of the casing and into and through a pipe 10 which may lead to any point where the gas may be used for operating or other purposes. The oil may be drained from the separator when necessary through a drain pipe 11 at the bottom and the gas line 10 may have one or more outlets, as at 12, for drawing off quantities of gas for any purpose.

When used as a separator, the apparatus being installed in a vertical position near a tank T, the lower portion of the casing A constitutes a reservoir for receiving the oil which is discharged thereinto through pipe B, in which the oil may fill up to a point, 15 where the pressure therein, due to the height of the column of oil, will open the back pressure valve b and thus discharge the oil into the tank T until the said valve balances the weight due to the column of oil. This tends to maintain a somewhat fixed level of oil in the gravity reservoir and causes the gas to flow through the outlet 5 and pipe 10.

In the event that there should be an excess supply of gas in casing A, a relief valve (not shown) may be interposed in the gas line 10 to relieve the pressure. The elevations of the oil inlets and gas and oil outlets may be arranged to suit the particular requirements of each case; also the height of the casing A and pipe B, but these elevations and distances are governed by the obtaining gas pressure.

The admission of the oil from pipe B to casing A above the level of oil in the casing reservoir eliminates agitation of the oil in the reservoir and reduces to a minimum the possibility of discharging the oil through
the gas outlet 5 and pipe 10. Also, as the separation is effected above the level of the oil a more complete separation of the gas and oil is effected than would otherwise be possible.

When it is desired to use the apparatus for purposes other than as a separator, the valve V may be opened and the oil will then flow through the casing A, oil outlet 4 and pipe 9 to the flow or storage tank T. As shown in Fig. 4, the apparatus may be suitably braced in its vertical position by means of guys G attached by suitable means to the casing A and anchored at their lower ends in the ground, or otherwise.

In the consideration of my invention, it will be apparent that I have provided a simple and effective apparatus whereby the oil and gas delivered through a single pipe from an oil well may be more completely separated than has been heretofore possible with other means, and this object is accomplished through the medium of an uncomplicated mechanism which will render the operation thereof positive and free from trouble heretofore encountered in the operation of devices for like purposes.

What I claim is:

A gas and oil separator of the character described comprising a vertical cylinder 30 having closures at the ends, an oil inlet at the bottom thereof, an oil outlet also at the bottom thereof, a gas outlet in the top of the cylinder, a combined oil and gas pipe leading from a source of supply and connected with said inlet, a branch pipe leading upwardly therefrom and having an inlet nozzle projecting into said cylinder at a point substantially below the top thereof and substantially above the maximum level of oil therein, a gas chamber being provided above the level of the oil and the top of said cylinder, a valve interposed between said branch pipe and said inlet for permitting the flow of oil directly into the bottom of said cylinder or through said branch pipe, at will, and a back pressure valve connected with said oil outlet for maintaining a substantially uniform volume of oil and pressure of gas in said outlet, for the purpose described.

HERBERT WIRSHING.

Witnesses:

RALPH C. RILEY,
MARION H. BROWNE.