A. B. COGSWELL.

OIL AND GAS SEPARATOR.

APPLICATION FILED JULY 2, 1913.

1,150,342. Patented Aug. 17, 1915.

FIG. 1.

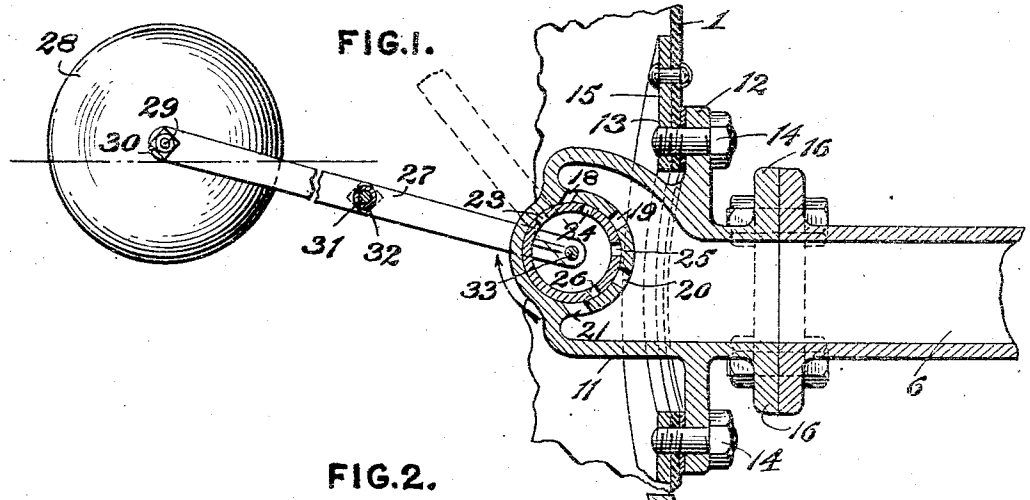


FIG. 2.

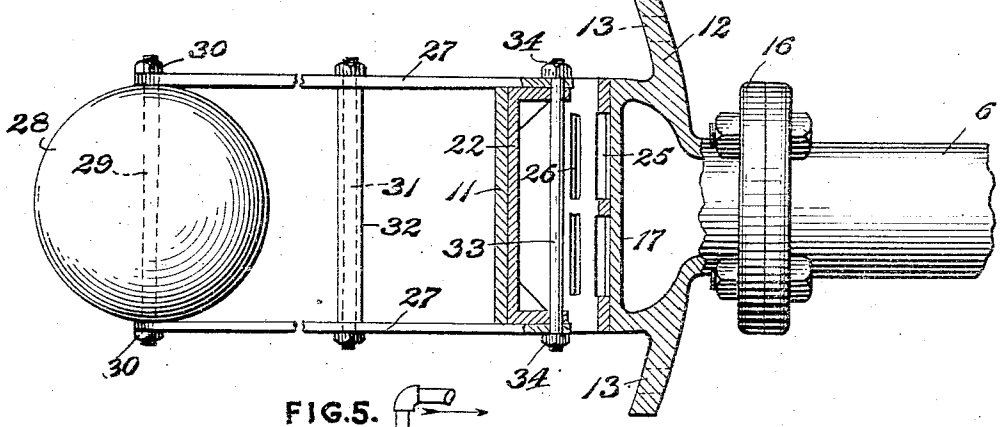


FIG. 5.

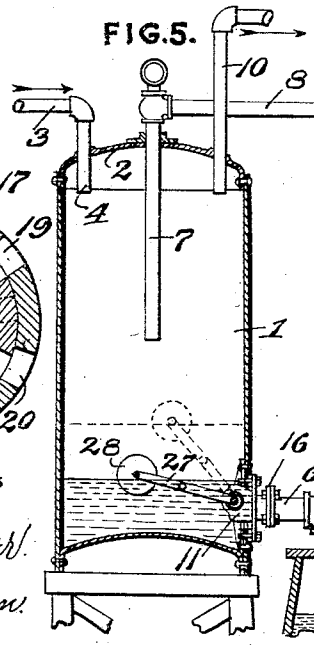
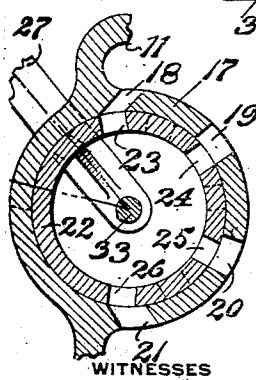


FIG. 4.

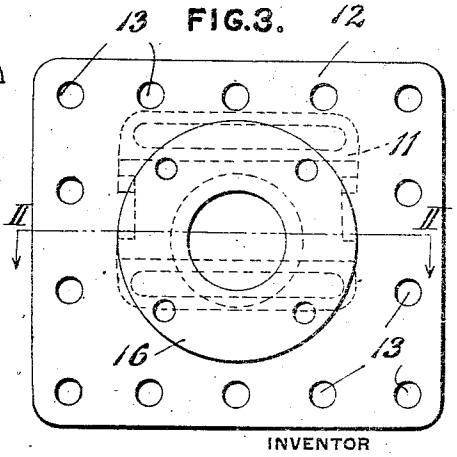


WITNESSES

F. E. Gaither.

Lois Wineman.

FIG. 3.



INVENTOR

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UNITED STATES PATENT OFFICE.

ARTHUR B. COGSWELL, OF OSWEGO, NEW YORK, ASSIGNOR TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

OIL AND GAS SEPARATOR.

1,150,342. Specification of Letters Patent. Patented Aug. 17, 1915.

Application filed July 2, 1913. Serial No. 776,947.

To all whom it may concern:

Be it known that I, ARTHUR B. COGSWELL, a citizen of the United States, residing at Oswego, in the county of Oswego and State of New York, have invented certain new and useful Improvements in Oil and Gas Separators, of which the following is a specification.

The prime object of my invention is to provide a new and improved automatically operable oil and gas separator, particularly designed for use in the oil fields in separating the gas and oil as the fluid comes from a well.

In the accompanying drawing, which illustrates an application of my invention, Figure 1 is a broken sectional view of a portion of a tank showing my float actuated rotary valve mechanism applied thereto; Fig. 2 is a detailed view partly in plan and partly in horizontal section, the section being taken on line II—II of Fig. 3; Fig. 3 is a front elevational view of the rotary valve mechanism; Fig. 4 is an enlarged detailed sectional view particularly showing the ported valve seat and the coacting ported valve proper; and Fig. 5 is a vertical sectional view of a tank showing the fluid inlet, fluid outlet, liquid discharge pipe, and the float actuated rotary valve mechanism applied thereto.

Referring to the drawing, 1 designates a tank having a top cover plate 2 secured thereto. This tank is in communication with the well by means of a fluid intake pipe 3 having a connection 4 extended through the cover 2. In practice, the tank 1 is arranged near an oil tank or receptacle 5, said tanks 1 and 5 being connected by means of a jointed liquid discharge pipe 6.

7 designates an overflow pipe leading from the interior of the tank to the exterior thereof and in communication with the oil receptacle 5 by means of pipes 8 and 9, and 10 designates a fluid or gas discharge pipe leading from the interior of the tank 1 to any convenient point.

A characteristic and important feature of the present invention is the float actuated rotary valve mechanism applied to the lower end of the tank and designed to automatically control the passage of the oil or liquid from the interior of the tank 1 to the tank 5.

As illustrated and as preferred, the rotary valve mechanism comprises a casing 11 provided with a flange 12, the latter having a series of bolt holes 13 adapted to receive a series of bolts 14 passed through said holes 13 and a wall of the tank 1, as well as a reinforcing plate 15 disposed on the interior of the tank. Said valve casing also has formed integral therewith an annular flange 16 by means of which the discharge pipe 6 is connected with the valve casing.

The valve casing is formed with an integral ported valve seat 17 having a series of concentrically arranged ports 18, 19, 20 and 21, the cross sectional area of the ports 18 and 19 vary in size, and said ports are both smaller than the ports 20 and 21.

Located within the valve seat, I provide a ported valve 22 having ports 23, 24, 25, and 26 respectively adapted to coöperate with the ports 18, 19, 20 and 21 of the valve seat.

Fig. 1 shows the rotary valve 22 closed, cutting off communication with the interior of the tank and the liquid discharge pipe, and Fig. 4 shows the valve open with all of the ports of the valve 22 registering with the ports of the valve seat. The relative position of the ports 23, 24, 25, and 26 of the valve proper with respect to the ports in the valve seat is such that the port 26 as the float rises, due to the increased amount of liquid in the tank, will register with its port 21 and will start opening before the other ports 25, 24, and 23 come into register with their respective ports in the valve seat. This construction permits a varying discharge of the liquid through the discharge pipe, depending upon the varying height of the liquid within the tank 1.

Connected with the valve 22 by means of arms or levers 27, is a ball float 28. Float 28 is attached to the outer ends of levers 27 by means of a cross-rod 29, passing through the center of float 28, and nuts 30. Located between the float 28 and the valve 22, I provide a cross-rod 31 and a sleeve 32 designed to connect the rods 27 at a point intermediate their ends, thereby providing a rigid frame. The opposite ends of the levers or rods 27 are connected with the valve 22 by means of a rod 33, which latter is passed through the center of valve 22 and has its ends projected through holes in the rods 27. These parts are then tied together by nuts 34.

What I claim is:—

1. A valve casing, a cylindrical valve seat in said casing provided with a plurality of differently sized ports, and a rotary valve in the seat provided with ports of equal areas, the ports in the valve being offset with respect to those in the seat so that a relative movement between the valve and casing in one direction will gradually increase the communicating port areas in the valve and seat.

2. A valve casing, a cylindrical valve seat in said casing provided with a row of ports of gradually increasing size, and a rotary valve in the seat provided with a row of ports of equal areas, the ports in the valve being offset with respect to those in the seat so that a relative movement between the valve and casing in one direction will gradually increase the communicating port areas in the valve and seat.

3. A valve casing, a cylindrical valve seat in said casing provided with a row of differently sized ports, and a rotary valve in the seat provided with a row of ports all of which are substantially the same size as that of the smallest port in the valve seat, the ports in the rotary valve being offset with respect to those in the seat so that a relative movement between the valve and casing in one direction will gradually increase the communicating port areas in the valve and seat.

4. Valve mechanism for separators comprising a casing, a cylindrical valve seat in said casing permanently open to the outlet, said seat having its axis extending horizontally, and a cylindrical rotary valve in the seat and permanently open at its end to the intake, said valve and seat having ports relatively arranged to permit gradual increase of communicating port area between the intake and off-take by movements of the valve in one direction, in combination with float mechanism within the supply to the intake for automatically operating the valve mechanism, said seat having parallel ports differing in port area.

5. Valve mechanism for separators comprising a casing, a cylindrical valve seat in said casing permanently open to the outlet, said seat having its axis extending horizontally, and a cylindrical rotary valve in the seat and permanently open at its end to the intake, said valve and seat having ports relatively arranged to permit gradual increase of communicating port area between the intake and off-take by movements of the valve in one direction, in combination with float mechanism within the supply to the intake for automatically operating the valve mechanism, said seat having parallel ports differing in port area, said valve having parallel ports of substantially similar area.

6. Valve mechanism for separators comprising a casing, a cylindrical valve seat in said casing permanently open to the outlet, said seat having its axis extending horizontally, and a cylindrical rotary valve in the seat and permanently open at its end to the intake, said valve and seat having ports relatively arranged to permit gradual increase of communicating port area between the intake and off-take by movements of the valve in one direction, in combination with float mechanism within the supply to the intake for automatically operating the valve mechanism, said seat having parallel ports differing in port area, said valve having parallel ports of substantially similar area, said valve ports being offset with respect to the seat ports.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR B. COGSWELL. [L.S.]

Witnesses:

BEN R. COGSWELL,

J. S. HERGERTY.