J. SCHNEIBLE.

SEPARATOR.

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1,238,829.

Patented Sept. 4, 1917.

2 SHEETS—SHEET 1.

Fig. 2.

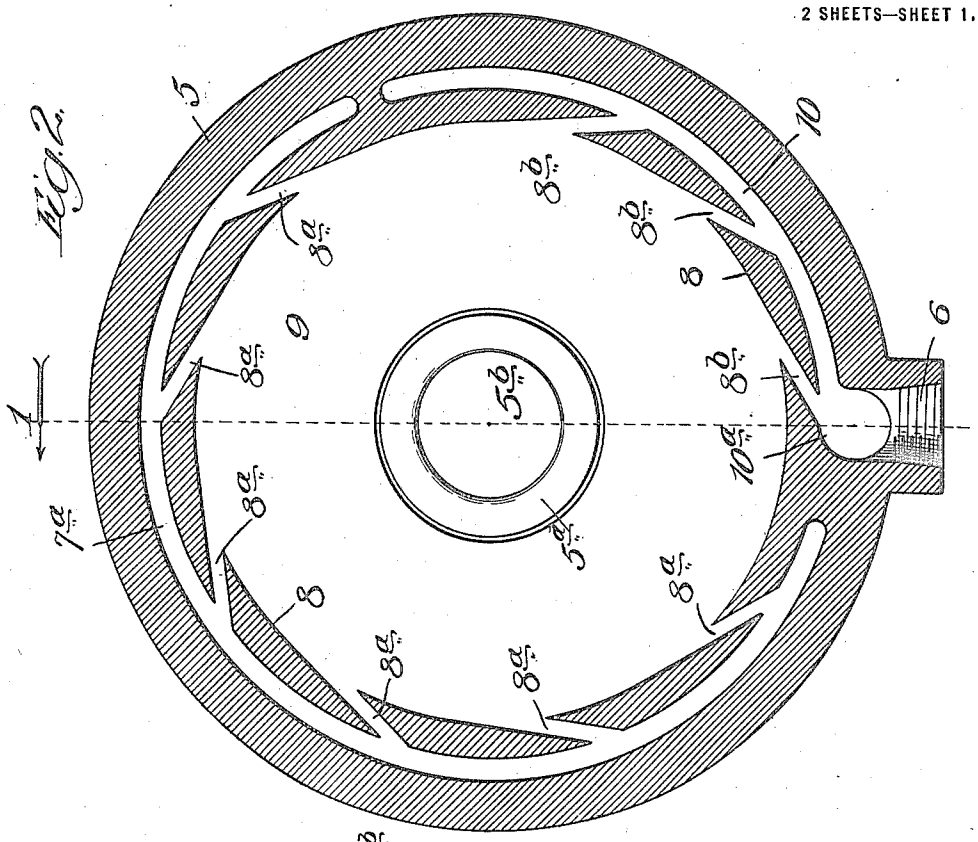
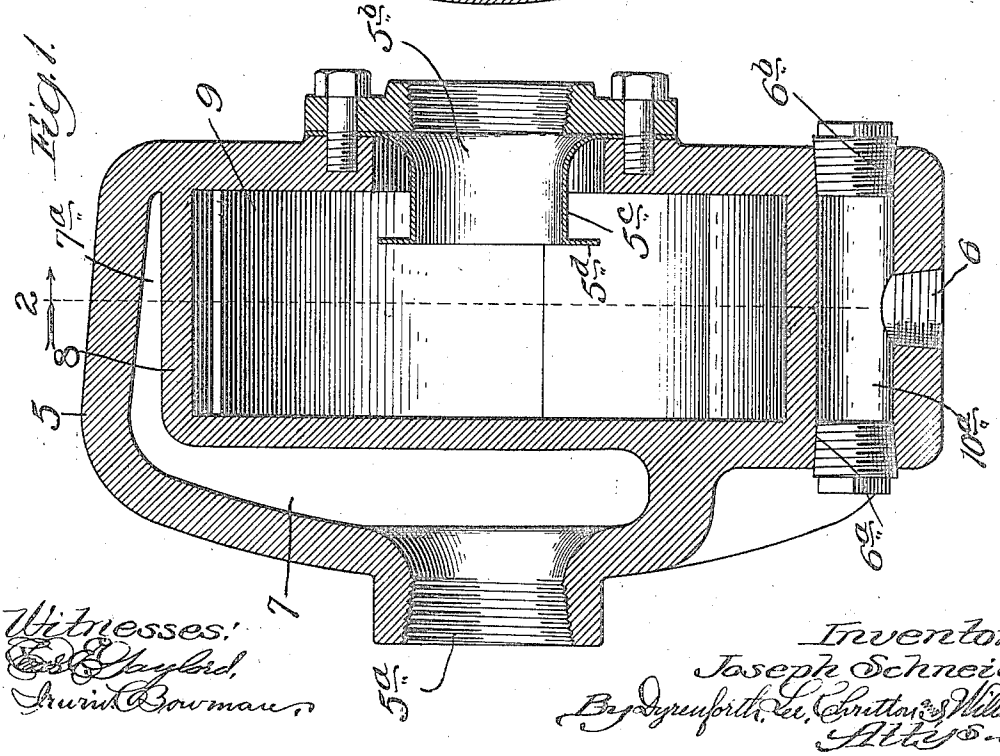


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

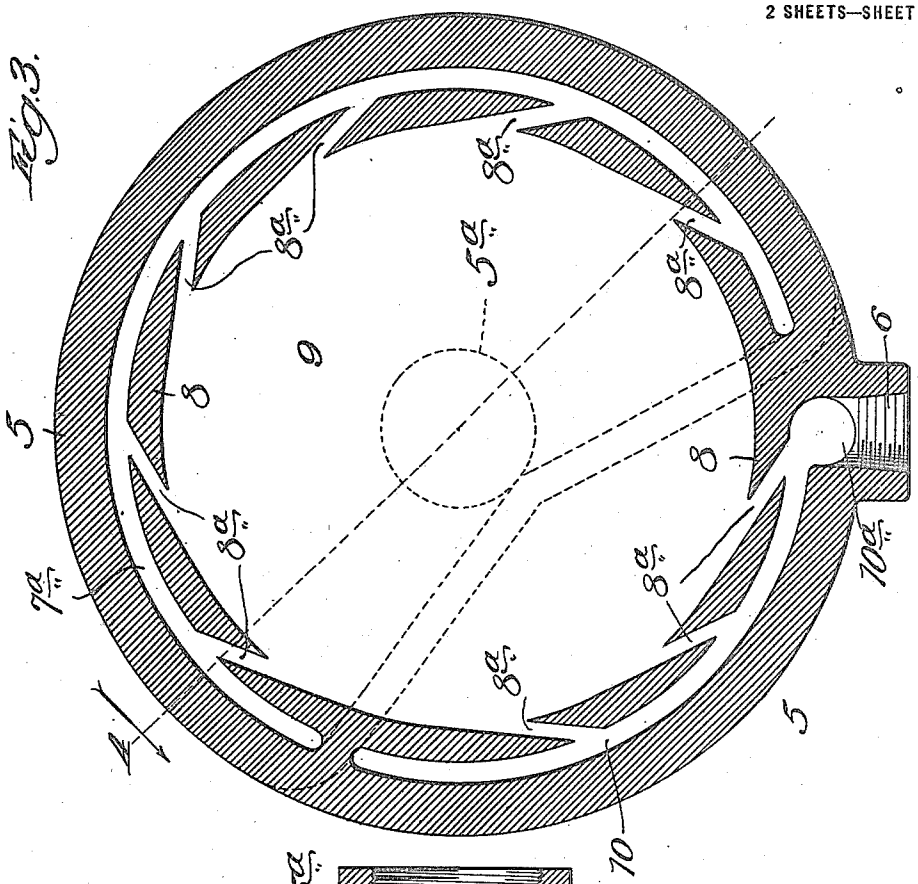
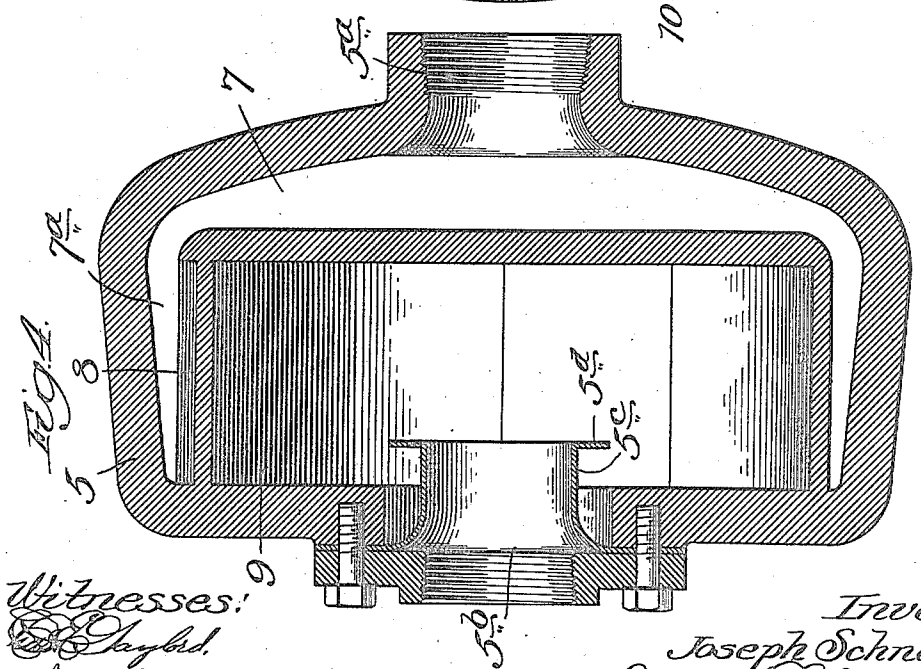


Fig. 4.



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UNITED STATES PATENT OFFICE.

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SEPARATOR.

1,238,829. Specification of Letters Patent. Patented Sept. 4, 1917.

Application filed December 5, 1914. Serial No. 875,600.

To all whom it may concern:

Be it known that I, JOSEPH SCHNEIBLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Separators, of which the following is a specification.

My invention relates to an improvement in separators for centrifugally separating relatively heavy matter out of fluid carrying the same.

The primary objects of the invention are to increase the efficiency of separators designed for the separation of oil, water, or other matter from a fluid, such as steam, gas, or air carrying the same; to provide a separator which is universally applicable and is operative in a horizontal position as well as in a vertical position with either up or down current; to prevent accumulation of separated matter in the separating chamber by forcibly expelling the same therefrom instantly upon the separation taking place; and to prevent creeping of the separated matter, and more particularly the separated oil, along surfaces into the delivery outlet.

While my improved separator, of the construction illustrated in the accompanying drawings, is especially designed for freeing air, gas or steam of lubricating oil, water of condensation, or other relatively heavy or separable matter, it is not the intention to limit it to any particular application, but for the sake of brevity and convenience the description hereinafter contained is confined to the special purpose of freeing lubricating oil from air carrying it.

In the accompanying drawings, Figure 1 shows my improved separator by a section on line 1, Fig. 2, viewed in the direction of the arrow; Fig. 2 is a section on line 2, Fig. 1, viewed in the direction of the arrow, looking toward the delivery-outlet; Fig. 3 is a section like that presented in Fig. 2, but looking in the opposite direction, namely toward the intake, and Fig. 4 is a section on line 4, Fig. 3, viewed in the direction of the arrow.

A casing 5 is provided in one end with an intake 5^a internally threaded to receive a supply-pipe (not shown) for the fluid to be treated, and in its opposite end with a delivery-outlet 5^b similarly threaded to receive a delivery-pipe (not shown) for the dry fluid, or fluid relieved of separable matter. In the periphery of the casing are shown to be provided three separate openings, 6, 6^a and 6^b, each internally threaded to receive a drain-pipe (not shown) for the matter separated. The opening 6 leads radially from the casing, while the openings 6^a and 6^b, which are shown to be plugged, lead at right angles from opposite points in the casing-sides. The intake 5^a leads to a receiving-chamber 7, having an extension 7^a surrounding a circular wall 8, to the extent of about two-thirds of the circumference of the latter, the wall forming a separating chamber 9 communicating with the receiving-chamber through tangential inlet-ports 8^a. A collecting-chamber 10 surrounds the remaining one-third of the circumference of the wall 8 and communicates with the separating chamber through outlet-ports 8^b for the matter separated, these outlet-ports being shown (though they need not be), tangential and in the opposite direction to the inlet-ports, and they lead to the chamber 10, which leads to an enlargement 10^a at which the discharge-openings 6, 6^a and 6^b are provided. The outlet 5^b for the dry fluid is provided with a nipple 5^c having a shielding flange 5^d about its inner end in the separating chamber, with which the nipple is concentric.

In operation, the air to be treated enters through the intake 5^a into the receiving-chamber 7, wherein it distributes itself and enters the chamber-extension 7^a, whence it is guided by the ports 8^a tangentially into and courses vortically about the separating chamber 9. By thus imparting to the laden air a circular motion, by the action of the resultant centrifugal force the oil, because of its relatively great weight (it being nearly one thousand times as heavy as the air) is instantly thrown outwardly against the inner surface of the circular wall 8 and through the ports 8^b, which are tangential in the direction of rotation, into the chamber 10, wherein the oil collects and flows by its own gravity into the enlargements 10^a, whence it discharges through an opening 6, 6^a or 6^b, depending on the position of the separator. In the position of the separator shown, the separated oil discharges at 6, but would discharge at 6^a or 6^b, the respective plug being removed, whichever were at the bottom in either of the other positions of the separator.

When the circular motion imparted to the laden air in the separating chamber causes the relatively heavy oil to be thrown by the resultant centrifugal force out of suspension through the ports 8^b, as described,

the dry or oil-free air courses vortically about the nipple 5^c, extending centrally into the separating chamber, and thus into the core of the vortex therein, and the dry air is forced out at the vortex through the delivery-outlet 5^b and is supplanted by incoming air to be treated in the manner already explained.

Some of the separated oil clings to the inner wall-surface of the chamber 9 and tends to creep along the same and get to the nipple 5^c and to the mouth of the latter. Were no means provided to prevent, such oil would be carried into the nipple by the dry air and thus defeat an all important purpose of the apparatus, which is to effect complete separation of the oil from the air. Such faulty operation is prevented by the flange 5^a, which, by extending at right-angles to and against the radially-inward flow of dry air, acts as a shield to intercept the creeping oil and thus prevents it from entering the mouth of the nipple to contaminate the oil-freed air.

What I claim as new and desire to secure by Letters Patent is—

1. In a separator of the character described for separating oil and steam for example, in combination, a casing provided with an intake, a circumferential wall within and spaced from the casing forming an inner circular separating chamber, said wall containing a plurality of substantially tangential inlets for the passage of steam and oil therethrough to the inner chamber and reversely arranged tangential outlets from said chamber for the discharge of oil, and a delivery nipple projecting centrally into said chamber.

2. In a separator of the character described, in combination, a casing provided with an intake, a circumferential wall within and spaced from the casing and forming therewith a receiving chamber and a collecting chamber divided therefrom and provided with an exit port, said wall forming an inner circular separating chamber communicating with the receiving and collecting chambers respectively through a plurality of reversely arranged inlet and outlet ports in said wall, and a delivery nipple extending centrally into the separating chamber whereby the matter to be treated enters the separating chamber through the several tangential inlet ports to circulate vortically about the delivery nipple and throw out by centrifugal force the heavier particles through the tangential outlets to the collecting chamber.

3. In a separator of the character described, in combination, a casing provided with an intake, a circumferential wall within and spaced from the casing and forming therewith a receiving chamber and a collecting chamber divided therefrom and provided with an exit port, said wall forming an inner circular separating chamber and containing a plurality of tangential inlets leading from the receiving chamber and a plurality of reversely arranged tangential outlets leading from the separating chamber to the collecting chamber, a delivery nipple extending centrally into the separating chamber and a shield extending about the mouth of said nipple whereby the matter to be treated entering from the receiving chamber into the separating chamber is caused to circulate rapidly about the delivery nipple and throw the heavier matter out centrifugally through the tangential outlet ports to the collecting chamber and allow the lighter material to pass out centrally through the delivery nipple.

JOSEPH SCHNEIBLE.

In presence of—
LOUSE HEISLAR,
OTTILIE C. AVISUS.