

No. 813,368.

PATENTED FEB. 20, 1906.

E. H. DUTCHER.  
CENTRIFUGAL FILTER.  
APPLICATION FILED OCT. 7, 1905.

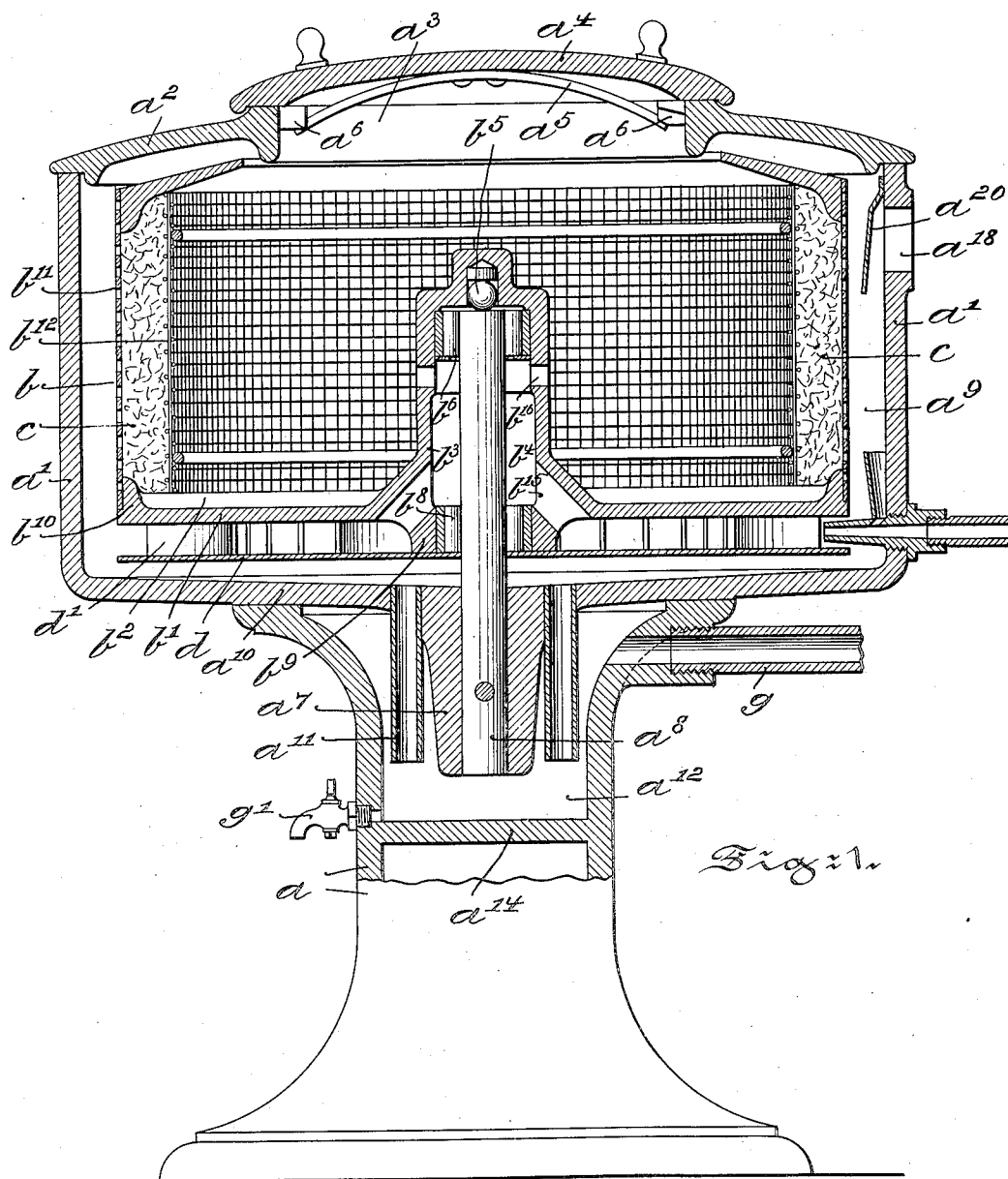


Fig. 1.

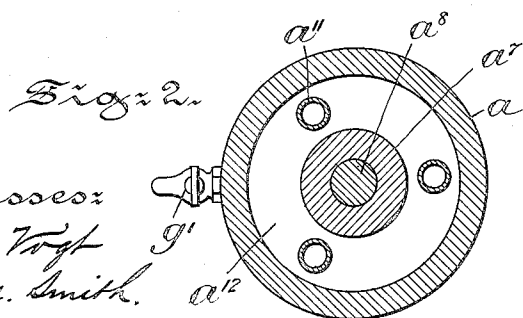


Fig. 2.

Witnesses:  
Wilhelm Vogt  
Thomas M. Smith.

Inventor:  
Edward H. Dutcher  
By J. Walter Douglas  
Attorney.

# UNITED STATES PATENT OFFICE.

EDWARD H. DUTCHER, OF SIEGFRIED, PENNSYLVANIA, ASSIGNOR, BY  
DIRECT AND MESNE ASSIGNMENTS, TO LEHIGH OIL AND WASTE  
SAVING COMPANY, OF CAMDEN, NEW JERSEY.

## CENTRIFUGAL FILTER.

No. 813,368.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Original application filed July 3, 1905, Serial No. 268,105. Divided and this application filed October 7, 1905. Serial No. 281,742.

*To all whom it may concern:*

Be it known that I, EDWARD H. DUTCHER, a citizen of the United States, residing at Siegfried, in the county of Lehigh and State of Pennsylvania, have invented certain new and useful Improvements in Separators for Centrifugal Oil Extracting and Filtering Machines, of which the following is a specification.

My invention has relation to a separator for centrifugal oil extracting and filtering machine, and in such connection it relates more particularly to the construction and arrangement of such a separator, and being a division of an application for a patent filed by me under date of July 3, 1905, under the Serial No. 268,105.

The principal object of my invention is to provide a centrifugal oil extracting and filtering machine with a separator partially formed by the housing of the machine and with means carried by the same and partially formed by the standard of the machine and with means carried thereby, to permit of the collecting and settling of oil and water commingling with the same and extracted from material confined in a basket and the separation and separate discharge of the oil and water therefrom.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a view, partly in front elevation and partly in vertical central section, illustrating the basket for the oily material, the means for supporting and rotating the same in a stationary housing, and a separator for the extracted and purified oil and water commingling with the same partially formed by the housing and a standard carrying the same, constituting main features of my present invention; and Fig. 2 is a horizontal sectional view of the upper end of the standard and the lower portion of the housing of the machine and of pipes carried by the housing and extending into the standard.

Referring to the drawings,  $a$  is the standard of the machine, to the upper end of which is suitably secured a housing  $a'$ , annular in cross-section, having a cover  $a^2$ , provided with an opening  $a^3$ . This opening is nor-

mally closed by a lid  $a^4$ , which by means of a leaf-spring  $a^5$ , secured to the under side of the lid  $a^4$ , is removably connected with the housing  $a'$  by engaging projections  $a^6$  thereof. The housing  $a'$  is provided with a centrally-arranged projection  $a^7$ , extending into the standard  $a$ , which serves as a support for a shaft  $a^8$ . The shaft  $a^8$  within the housing  $a'$  serves as a support for a basket  $b$ , adapted to receive material, more or less, saturated with oil, which is to be extracted therefrom. The basket  $b$  preferably consists of an annular disk or bottom plate  $b'$ , strengthened by ribs  $b^2$ , having a central upwardly-projecting portion  $b^3$ , forming a chamber  $b^4$ , and a support for a ball-bearing  $b^5$ , centrally engaging the upper surface of the shaft  $a^8$ , and a roller-bearing  $b^6$ , surrounding the shaft adjacent to the ball-bearing  $b^5$ . These bearings, in conjunction with a roller-bearing  $b^7$ , arranged in an extension  $b^8$  of the projection  $b^3$ , serve to support the plate  $b'$  on the shaft  $a^8$  and to permit of an easy turning thereon.

The plate  $b'$  adjacent to its perimeter is provided with a flange  $b^{10}$ , which holds a perforated cylinder  $b^{11}$ , carried by the plate  $b'$ , in its proper position. In addition to the perforated cylinder  $b^{11}$  the plate  $b'$  is provided with a second cylinder  $b^{12}$ , preferably formed of coarse-meshed wire-netting, which, in conjunction with the cylinder  $b^{11}$ , forms an annular chamber for the reception of a suitable filtering material  $c$ . In this basket  $b$  is placed the material from which oil is to be extracted, and below the bottom plate  $b'$  and secured to the extension  $b^8$  of the projection  $b^3$  is arranged an annular disk  $d$ , which is provided adjacent to its outer periphery with curved blades  $d'$ , radially arranged with respect to the shaft  $a^8$ . This disk  $d$ , in conjunction with a nozzle  $e$ , arranged in the wall of the housing  $a'$ , forms a turbine and the motive power is furnished by steam issuing from the nozzle  $e$  and impinging against the blades  $d'$ , which sets the disks  $d$  and the basket  $b$  in rapid rotation. In this rotation and by centrifugal force all the oil in the material placed in the basket  $b$ , as well as impurities and other extraneous matter in the same, are liberated therefrom and forced into the filtering material  $c$  by readily passing through the inner wall  $b^{12}$ . The filtering material  $c$ , however, arrests all these impurities, not alone

of the oil extracted from the waste material, but also those previously held by the oily material and only permits extracted oil to pass therethrough. The oil when finally leaving the filtering material *c* and passing through the openings in the outer wall *b*<sup>11</sup> is in a thoroughly-purified state, ready again for use. Owing to centrifugal force, this oil is forced through the chamber *a*<sup>9</sup> formed between the basket *b* and the housing *a*<sup>7</sup> and against the inner wall thereof, and by flowing downward thereon is finally conducted by the inclined bottom *a*<sup>10</sup> of the housing *a*<sup>7</sup> and tubes *a*<sup>11</sup>, arranged therein, into a settling-chamber *a*<sup>12</sup>, formed in the standard *a* by a partition-wall *a*<sup>14</sup>.

In addition to rotating the basket *b* the steam is also utilized to heat the oily material and to thin the oil therein, and hence to facilitate removal and extraction of the oil from the oily material by passing through openings *b*<sup>15</sup>, arranged in the plate *b*<sup>7</sup>, into the chamber *b*<sup>4</sup> of the projection *b*<sup>3</sup>, and therefrom by means of openings *b*<sup>16</sup> into the interior of the basket *b*. The steam finally leaves the basket *b* through the opening *a*<sup>18</sup>, arranged in the housing *a*<sup>7</sup>. As shown in Fig. 1, this opening *a*<sup>18</sup> is covered by a guard-plate *a*<sup>20</sup>, which prevents oil from passing through the same. A certain portion of the steam by being brought into direct contact with the oily material is condensed therein, and the water so formed, in conjunction with the oil, is forced through the filtering material into the housing *a*<sup>7</sup> and flows from thence into the settling-chamber *a*<sup>12</sup> by means of the pipes *a*<sup>11</sup>. The oil being of less specific gravity than the water will readily separate therefrom in the settling-chamber *a*<sup>12</sup> and by means of a pipe *g* will be conducted from the same. A drain-cock *g*<sup>7</sup>, arranged in alinement with the partition-wall *a*<sup>14</sup>, permits of the draining of the accumulated water from the settling-chamber *a*<sup>12</sup>.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A separator for centrifugal oil extracting and filtering machines, consisting of a standard having a settling-chamber, a housing carried by said standard having a bottom downwardly inclined toward its central portion, means arranged in said bottom for connecting the housing with said settling-chamber, a basket for oil-containing material having outer and inner perforated walls for per-

mitting of the passage of oil and water therethrough into said housing and of the conducting of the oil and water by its bottom and the connecting means carried by the same into said settling-chamber, and outlets arranged at different planes in said standard for permitting the separate removal of oil and water therefrom.

2. A separator for centrifugal oil extracting and filtering machines, consisting of a standard having a settling-chamber, a housing carried by said standard having an inclined bottom, tubes arranged in said bottom extending into said settling-chamber and adapted to connect the housing with said chamber, a basket for oil-containing material having walls adapted to permit of the passage of oil and water therethrough and rotatably arranged in said housing, said housing adapted to collect oil and water from said basket and by the inclined bottom thereof to conduct the same into said tubes, an outlet for oil and an outlet for water in said standard arranged above and below the free ends of said tubes, to permit of separate removal of the oil and water from said settling-chamber.

3. A separator for centrifugal oil extracting and filtering machines, consisting of a standard having a settling-chamber, a housing carried by said standard having an inclined bottom, tubes arranged in said bottom and extending into said settling-chamber and adapted to connect said housing therewith, a basket for oil-containing material having walls to permit of the passage of oil and water therethrough and rotatably mounted in said housing, said housing adapted to collect oil and water from said basket and by the inclined bottom thereof to conduct the same into said tubes, a drain-pipe for oil and a drain-cock for water arranged above and below the free ends of said tubes, respectively, and adapted to permit of the separate removal of the oil and of the water from said settling-chamber and tubes to permit of the discharge of the oil and water at a point normally below the level of the oil, in said chamber.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

EDWARD H. DUTCHER.

Witnesses:

JOHN G. KOCH,  
R. L. COPE.