

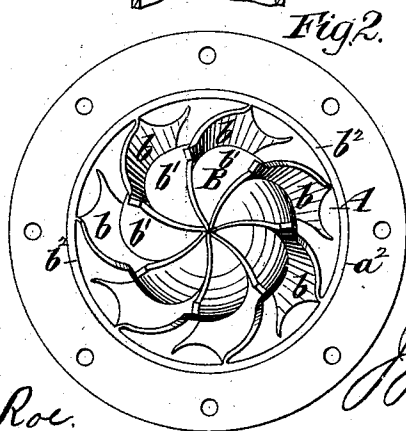
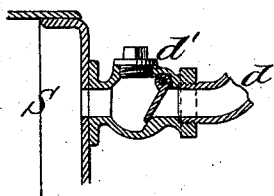
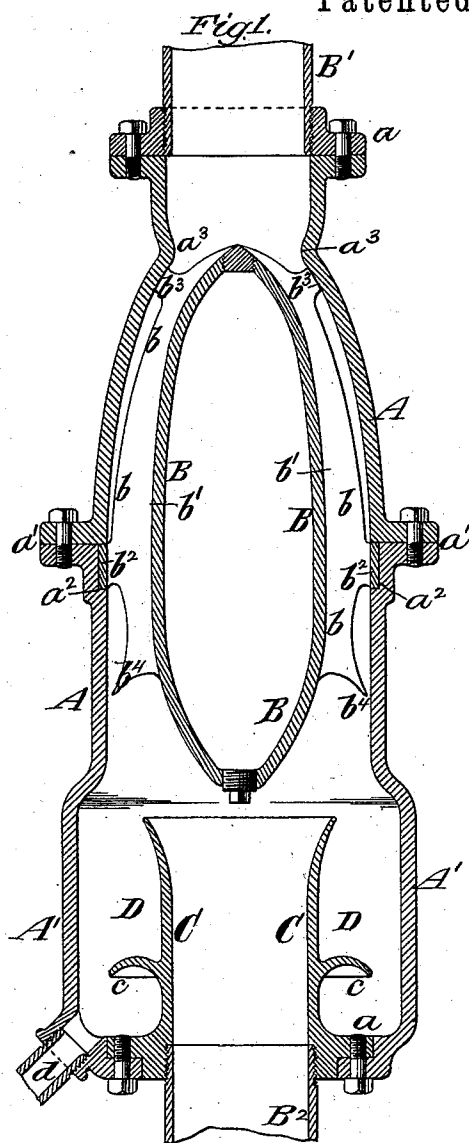
(No Model.)

J. J. DE RYCKE.

SEPARATOR.

No. 379,009.

Patented Mar. 6, 1888.



Witnesses:

O. Sundgren.

J. Wickham, Roe.

Inventor:

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by his Attys
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UNITED STATES PATENT OFFICE

J. JOSEPH DE RYCKE, OF NEW YORK, N. Y.

SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 379,009, dated March 6, 1888.

Application filed November 2, 1887. Serial No. 254,076. (No model.)

To all whom it may concern:

Be it known that I, J. JOSEPH DE RYCKE, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Separators, of which the following is a specification.

The object of my invention is to provide a very simple and effective apparatus which is specially designed for separating from live steam the water which may be carried off in suspension therewith; but the apparatus may be employed for separating from exhaust-steam the grease which may pass in suspension therein from the engine-cylinder.

My invention consists, essentially, in the combination, with a pipe or passage through which steam, either live or exhaust, passes, of a core or body which is located substantially concentric in the pipe or passage made conical or conoidal at the front end, and which is provided on its exterior with spiral channels, which may be formed by spiral ribs or flanges projecting from the circular exterior of the core or body and extending to the wall of the pipe or passage, and an annular well or receptacle for water or grease located at the base or back end of said core or body and serving to receive the water and grease separated from the steam by its momentum and centrifugal force. I preferably construct the pipe or passage with an inward contraction at the front or upper end of the core or body, so as to direct the steam inward upon the conical or conoidal end of the core or body and into the spiral channels with which it is provided, and by the spiral channels the steam is given a spiral direction in its movement through the pipe, which tends to generate in the steam sufficient centrifugal force to cause water or grease to be thrown outward and against the wall of the pipe or passage, and the water or grease by its momentum is forced downward along the said wall until it is caught in the annular well or receptacle through which the dry steam passes.

In my construction the core or body may not only have its top or front end conical or conoidal to receive the steam and spread it easily into the channels, but its base or back end may also be conical or conoidal to enable the steam to leave its channels without any tendency to produce a vacuum. The core or

body may be a hollow casting having the spiral channels formed by spiral ribs cast upon or secured to the casting, and the pipe or passage may be divided transversely in its length and the cone or body be supported between the two sections of the pipe or passage.

The well or annular receptacle in the pipe or passage at the base or back end of the core or body is formed by a concentric flange or wall joined to the wall of the pipe or passage and projecting longitudinally therein, and the dry steam passes through this annular flange or wall while the water, grease, or other liquid is by its centrifugal force and momentum driven into the annular well or receptacle, and the inner flange or wall of the well has upon it an auxiliary hooked flange which tends to retain therein the liquid driven thereinto, as hereinafter described. The outflow-pipe from the well may deliver to a boiler and have in it a check-valve. I prefer to form in the pipe or passage an annular enlargement below the core or body, and the annular flange or wall which combines to form the well or receptacle is opposite the annular enlargement.

The above-described features of construction are included in my invention.

In the accompanying drawings, Figure 1 is a longitudinal section of an apparatus embodying my invention; and Fig. 2 is a plan of the apparatus, the upper portion of the pipe or passage being removed so as to expose the core or body.

Similar letters of reference designate corresponding parts in both figures.

My apparatus comprises, as its essential elements, a pipe or passage, A, a core or body, B, located substantially concentric within the pipe or passage, and an annular well or receptacle, D, located at the lower or back end of the core or body within the pipe or passage. This apparatus may be arranged within a steam-pipe if it is desired to separate from the steam the water which may be held in suspension and which renders the steam wet, and within an exhaust-pipe if it be desired to separate from the steam grease which may have been taken up by the steam in its passage through the engine.

I have here represented as secured to the opposite ends of the pipe or passage A flanges a, with which are connected the pipes B' B²,

through which steam is received into and passes from the pipe or passage A. The core or body B is here represented as of circular shape, conforming to the pipe or passage A, and as made
 5 conical or conoidal in shape at opposite ends, and, as here shown, consists of a hollow cast-metal body having upon its exterior spiral ribs or flanges b , which form between them channels b' , extending spirally or obliquely
 10 lengthwise of the core or body B. I have here represented the pipe or passage A as made in two sections united by a flanged joint, a' , and the outer edges of the ribs or flanges b are here shown as being surrounded by a ring, b^2 ,
 15 which is received in a recessed seat, a^2 , in one of the pipe-sections, and thereby the central core or body is mainly supported. I have also shown the ribs b as having projections b^3 near their upper ends, which bear against the side
 20 of the pipe or passage A and steady the core or body B in position.

I have shown the pipe or passage A at the upper end of the core or body B as having a slight inward contraction, a^3 , which serves to
 25 direct the steam inward upon the conical or conoidal end of the core or body B and to produce the easy entrance of all the steam into the spiral channels b' . It is also important to have the lower end or rear end of the core or
 30 body conical or conoidal, so that the steam will leave the channels b' without any tendency to produce a vacuum.

Below the core or body B is an annular enlargement, A' , in the pipe or passage A, and
 35 immediately opposite this annular enlargement, and formed integral with the flange a , is a concentric annular flange or wall, C, through which dry steam passes to enter the pipe B², and which forms with the wall of the pipe or
 40 passage A a well or receptacle, D, from which the water is removed by an outflow-pipe, d .

In the operation of my apparatus the steam, by its velocity, passes swiftly along the spiral
 45 channels b' , and, owing to the momentum and centrifugal force generated, the water and also any grease which the steam may hold in suspension are driven against the wall of the pipe or passage and downward into the well
 50 D, and the ribs b have outwardly-projecting points b^4 , along which water may flow and drip into the well D.

The force with which the liquid is driven downward along the wall of the pipe or passage into the well D might be sufficient to cause
 55 it to fly up the annular flange or wall C, and to guard against this I provide on the wall C a hooked flange, c , which will deflect or throw down into the well any water which flies up against it.

60 It will be observed that the water may be delivered from the outlet-pipe d into a tank, or even into the boiler, if desired, without any trap; but if the device be used for separating the grease from exhaust-steam the discharge
 65 from the pipe d may be received in a tank, so

as to separate the grease therefrom before returning the water to the boiler.

I have here represented my device as upright; but it may be arranged horizontally, if
 70 desired.

I have here shown the pipe d as delivering directly into a boiler, S, and as having in it a check-valve, d' , to prevent the steam or water from passing upward through the pipe d .

What I claim as my invention, and desire to
 75 secure by Letters Patent, is—

1. The combination, with a steam pipe or passage, of a core or body located substantially
 concentric in the pipe or passage, made conical or conoidal at the front end, and provided
 80 on its exterior with spiral channels, and an annular well or receptacle located at the base or back end of said core or body, substantially as herein described.

2. The combination, with a steam pipe or
 85 passage having provision for the attachment of a supply-pipe at one end and a delivery-pipe at the other end, of a core or body located substantially concentric within the pipe or passage and provided on its exterior with
 90 spiral channels, the pipe or passage having at the front or upper end of said core or body an inward contraction, a^3 , to direct the entering steam upon the core or body, and an annular well or receptacle, D, at the back or lower end
 95 of said core or body, and through the center of which steam passes to the delivery-pipe, substantially as herein described.

3. The combination, with a steam pipe or
 100 passage, of a core or body arranged substantially concentric therein, and having a conical or conoidal form at opposite ends and spiral ribs or flanges forming spiral channels on its exterior, and an annular well or receptacle constructed in the pipe or passage at the back or
 105 lower end of the core or body, substantially as herein described.

4. The combination, with a steam pipe or
 passage divided transversely to its length, of a substantially-concentric core or body having
 110 spiral ribs or flanges upon its exterior, and which is supported in a rabbet formed between the two sections of which the pipe or passage is composed, and an annular well or receptacle, D, constructed in the pipe or passage at
 115 the lower or back end of the core or body and through the hollow center of which the steam passes to the delivery-pipe, substantially as herein described.

5. The combination, with the pipe or pas-
 120 sage A and the core or body B, constructed with spiral ribs or flanges upon its exterior, of the wall or throat C, forming a well or receptacle, from which leads an outlet, and having the hooked flange c , for directing liquid to the
 125 bottom of the well or receptacle, substantially as herein described.

6. The combination, with a steam pipe or passage having the annular enlargement A' and the circular throat or flange C, arranged
 130

opposite the said enlargement and forming
therewith a well or receptacle, of a core or
body having spiral ribs or flanges and arranged
substantially concentric in the pipe or passage,
5 substantially as herein described.

7. The combination, with the pipe or pas-
sage A, having connected with it at one end
the supply-pipe B', and having in its opposite
end the annular well D, formed by the circular
10 wall C, and the delivery-pipe B², extending
from the central passage through the well,

which is formed by the circular wall C, of a
central core or body, B, having spiral chan-
nels formed on its periphery and arranged in
the pipe or passage A, and the outlet-pipe d, 15
leading from the annular well direct to a steam-
boiler, and provided with a check-valve, d',
substantially as herein described.

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Witnesses:

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