No. 794,201. PATENTED JULY 11, 1905.

E. THEISEN.

CENTRIFUGAL GAS PURIFYING APPARATUS.

APPLICATION FILED FEB. 16, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

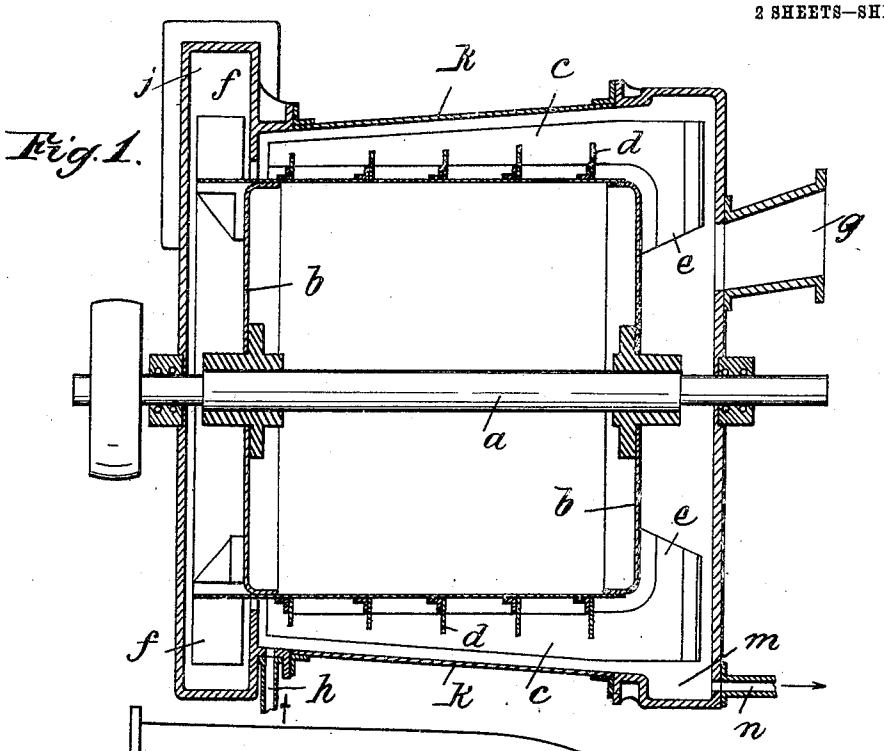
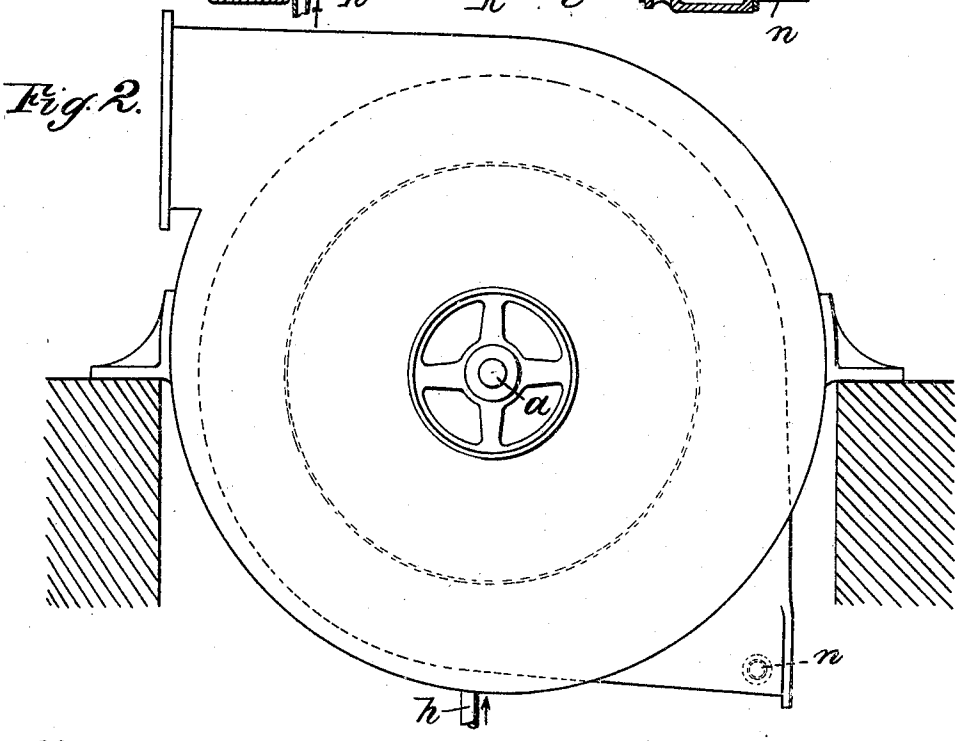


Fig. 2.



Witnesses:
Fritz v. Briesen
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Inventor:
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his attorneys.

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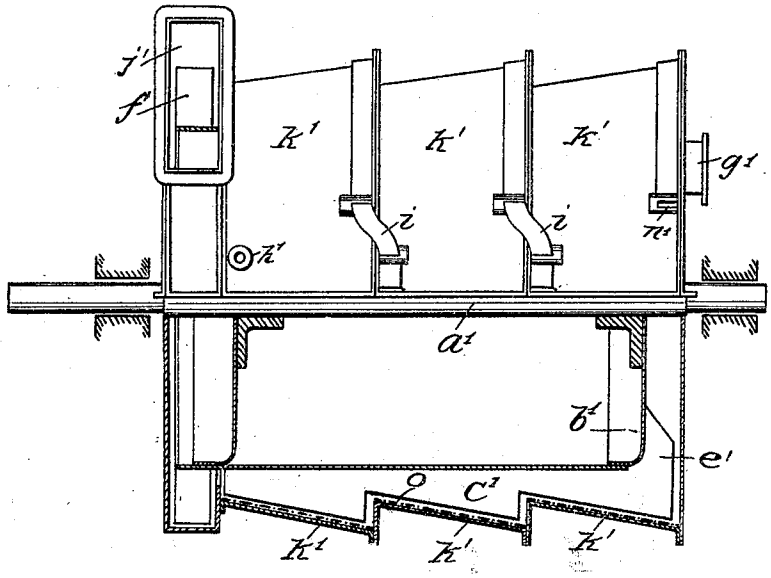
2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD THEISEN, OF BADEN-BADEN, GERMANY.

CENTRIFUGAL GAS-PURIFYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 794,201, dated July 11, 1905.

Application filed February 16, 1903. Serial No. 143,685.

To all whom it may concern:

Be it known that I, EDWARD THEISEN, residing at 10 Lichtenthaler Allee, Baden-Baden, in the Grand Duchy of Baden, Germany, have invented new and useful Improvements in Centrifugal Gas-Purifying Apparatus, of which the following is a specification.

The present invention relates to centrifugal apparatus such as described in United States Patent No. 709,527.

The special purpose of the present improvements is to introduce a greater quantity of water or other liquid into the apparatus without the use of a greater driving force and to cause thereby a more effective action of the gases and liquids for purifying, absorbing, and other purposes. I make for this purpose the fixed casing of conical shape, the narrow end of it at the entrance of the liquor, and I thereby facilitate the streaming of the water along the casing against the current of centrifugal gas. The rotating cylinder with centrifugal wings may be cylindrical or conical. Thereby the apparatus is especially adapted for the treatment of hot gases, which cool rapidly while passing the apparatus, and their volume is reduced thereby.

In the accompanying drawings, Figure 1 is a section through my apparatus; Fig. 2, an end view thereof, and Fig. 3 a side elevation of another form of my invention with parts in section.

In Figs. 1 and 2, *a* is a rotating shaft carrying the cylinder *b*. The cylinder is provided with vanes *c*, which extend lengthwise of said cylinder. These vanes have projections *e* at the entrance of the gases to cause a sucking action.

k is the conical casing.

h is the water-inlet.

m is a trough collecting the water.

n is the water-outlet.

f represents centrifugal wings to throw the gases out of the apparatus.

d represents ribs at the rear side of each of the vanes *c*. The ribs *d* extend from the rear side of each vane toward the next vane, but do not contact therewith. The outer edges of the vanes *c* are at an equal distance throughout from the wall of the casing *k*.

The inlet for the gases is indicated at *g* and the corresponding outlet at *j*.

In operation as the shaft *a* is rotated by power applied thereto the gases are drawn in through the inlet *g* by the action of the wings *f* and of the vane projections *e*. The vanes *c* whirl the gases around within the casing *k*. The gases are thrown outward by centrifugal force against the casing or drum *k* and travel toward the narrow or discharge end of said casing, leaving the same at the outlet *j*. This movement of the gases brings them into intimate contact with the water flowing through the casing in the direction opposite to that of the gases, since such water enters at *h* and leaves at *n*. The water cools the gases, so as to reduce their volume, and at the same time purifies them by absorbing certain impurities. The water under the influence of the gases thrown against it and of gravity travels in a spiral path along the inner surface of the casing *k*, and the velocity of the water is increased materially owing to the location of the inlet *h* at the narrow end and at a higher level than the outlet *n*. The cross-section of the annular space through which the gas and liquid flow decreases from the gas-inlet to the gas-outlet, thus insuring an efficient operation notwithstanding the contraction in the volume of the gases due to their cooling. Comparatively little power is required to drive my improved apparatus.

The form of construction shown in Fig. 3 comprises a casing consisting of a plurality of conical sections *k'* all facing in the same direction. On the shaft *a'* is mounted the drum *b'*, provided with vanes *c'*, which extend lengthwise of the drum *b'* and are stepped to fit the section *k'* and which at one end have projections *e'*. At the same end the surrounding stationary casing has an inlet *g'* for the gases. The gas-outlet *j'* is located at the other end of the casing, and at this end the rotary member of the apparatus has centrifugal wings *f''*. The water-inlet is indicated at *h'*, the water-outlet at *n'*. Connections *i* are provided to conduct the water from the wide end of one section *k'* to the narrow end of the adjacent section. Sieves

or screens *o* may be arranged on the inner surfaces of the sections *k'* to better hold the liquid in contact with the walls of the casing. The vanes *c'* are stepped corresponding to the shape of the casing; but the space between the outer edges of the vanes and the adjacent portions of the casing is preferably uniform at all points. The operation is substantially the same as described with reference to Figs. 1 and 2.

Now what I claim, and desire to secure by Letters Patent, is the following:

1. In centrifugal apparatus, the combination, with a tapered casing having means for the introduction of gas at its wide end and for the introduction of liquid at its narrow end, of rotary vanes arranged within said casing.

2. In centrifugal apparatus the combination with a casing consisting of several cones, means to introduce gases at the wider end of the last cone and means to introduce the liquid at the narrow end of every cone, substantially as described.

3. A centrifugal apparatus for the treatment of gases, comprising a rotary drum and a stationary approximately horizontal casing surrounding said drum, said casing being provided with inlets and outlets for gas and liquid respectively, and having its inner surface tapering toward the gas-outlet.

4. A centrifugal apparatus for the treatment of gases, comprising a rotary drum and a stationary approximately horizontal casing surrounding said drum, said casing being provided with inlets and outlets for gas and liquid respectively, and having its inner surface tapering toward the gas-outlet in a plurality of sections or steps.

5. A centrifugal apparatus for the treatment of gases, comprising a rotary drum and a stationary approximately horizontal tapered casing surrounding said drum, said casing being provided with a gas-inlet at its wide end, with a liquid-inlet at its narrow end, and with outlets for the gas and liquid at the respective opposite ends.

6. In centrifugal apparatus, the combination, with a tapered casing having means for the introduction of gas at its wide end and for the introduction of liquid at its narrow end, of rotary vanes arranged within said casing with their outer edges close to the tapered inner surface of the casing.

7. In centrifugal apparatus, the combination, with a horizontally-disposed tapered casing having a gas-inlet at its wide end, a liquid-inlet at its narrow end, and outlets for gas and liquid at the respective opposite ends, the liquid-outlet being at a lower level than the liquid-inlet, of a rotary drum within said casing.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD THEISEN.

Witnesses:
JEAN GRUND,
ROBERT BÜHL.