

No. 821,172.

PATENTED MAY 22, 1906.

R. L. KJERNER.
STEAM SEPARATOR.
APPLICATION FILED SEPT. 20, 1905.

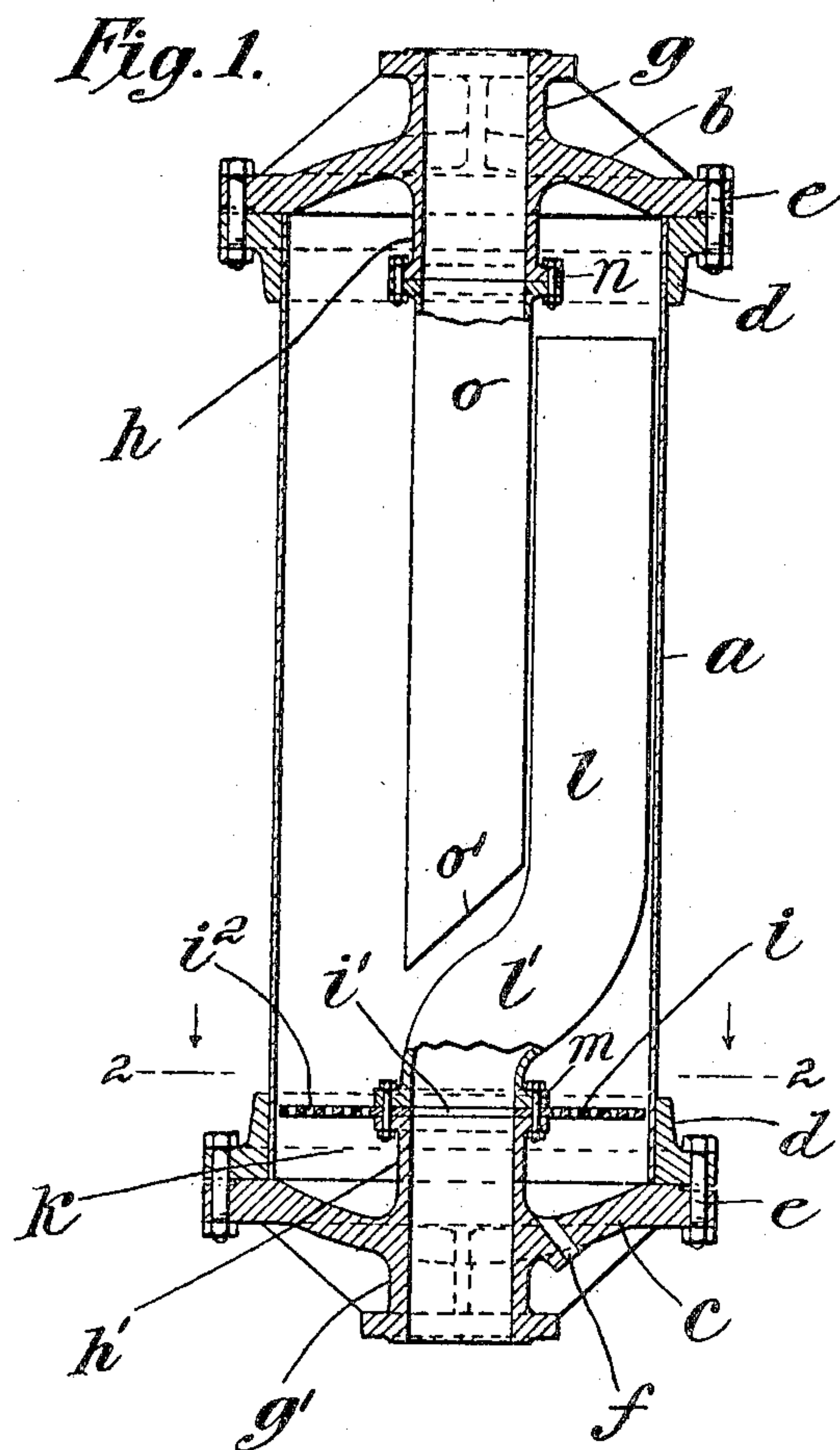
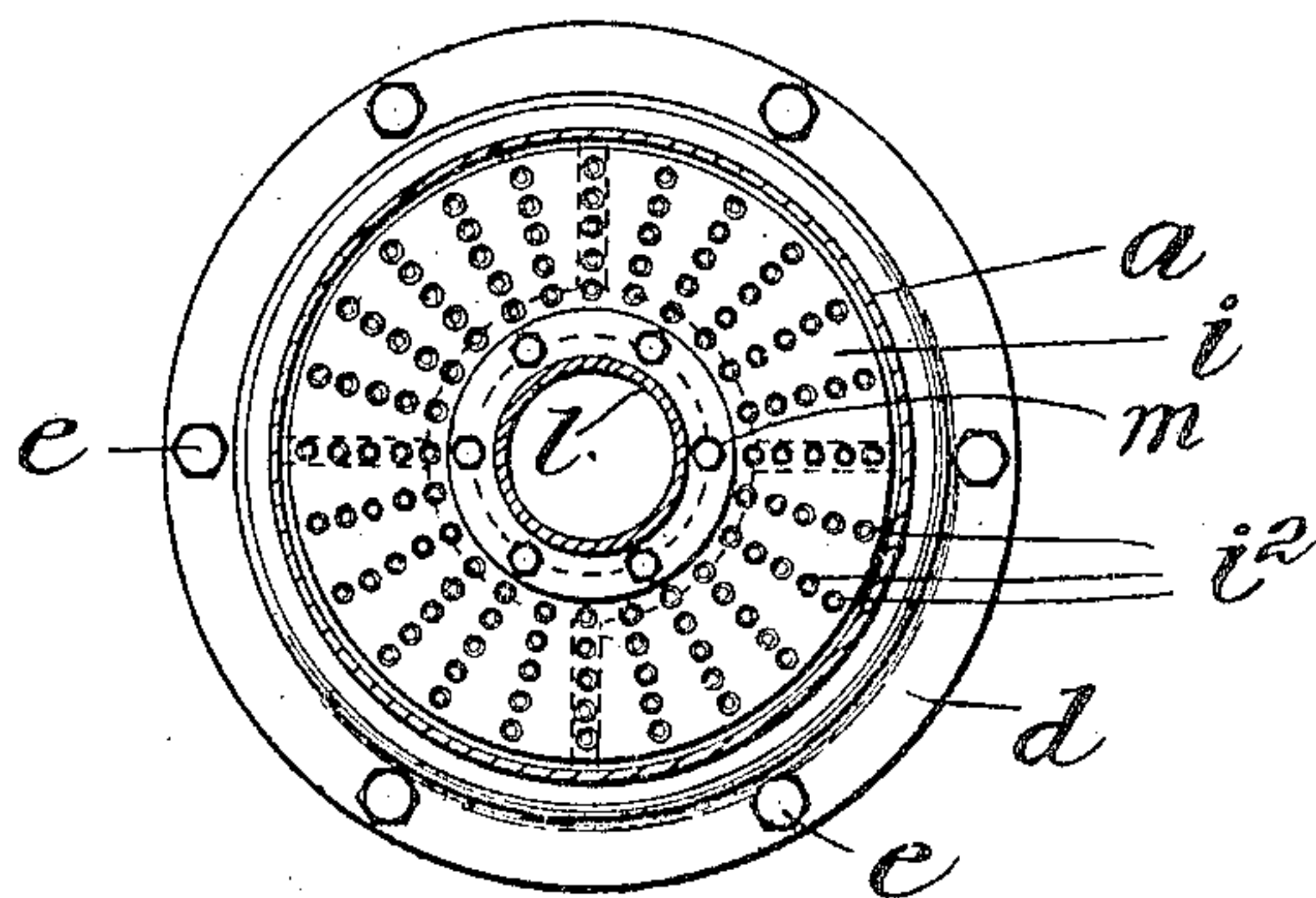


Fig. 2.



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UNITED STATES PATENT OFFICE.

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STEAM-SEPARATOR.

No. 821,172.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed September 20, 1905. Serial No. 279,362.

To all whom it may concern:

Be it known that I, RAGNAR L. KJERNER, a citizen of the United States, residing in the city of Yonkers, in the county of Westchester, in the State of New York, have invented certain new and useful Improvements in Steam Separators and Receivers, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The object of this invention is to produce a highly-efficient steam-separator of simple and compact construction.

The invention will be fully explained hereinafter with reference to the accompanying drawings, in which it is illustrated as embodied in a structure of suitable arrangement and proportions.

In said drawings, Figure 1 is a view in vertical central section of the improved separator, portions of the inlet and outlet pipes being shown in elevation. Fig. 2 is a view in horizontal section on the plane indicated by the line 2 2 of Fig. 1.

The drum of the separator, as shown in the drawings, comprises a cylindrical shell *a*, upper and lower heads *b c*, and rings *d*, which may be secured to the shell *a* in any convenient manner and to which the heads may be removably secured by bolts *e*. As will be observed, the upper and lower heads *b* and *c* are identical, save for the outlet at *f* in the lower head for the water of condensation. Each has an outwardly-projecting flanged neck *g g'*, to which the steam-inlet pipe and the steam-outlet pipe may be connected, respectively, and an inwardly-projecting flanged neck *h h'*, such necks being central with respect to the heads, as shown. Supported within the shell *a*, preferably secured to the flanged neck *h'*, is a disk *i*, preferably substantially of the same diameter as the inner diameter of the shell *a* and having a central aperture *i'* corresponding to the aperture through the neck *h'*, and externally to the neck *h'* a series of perforations *i²*, preferably countersunk from above, as shown. The perforated plate *i* forms a chamber *k* in the lower portion of the drum for the collection of the water of condensation, which is permitted to escape from time to time through the outlet *f*. A flanged steam-outlet pipe *l*

is also secured upon the end of the neck *h'* by the bolts *m*, which also serves to secure the perforated disk *i*, and is extended upwardly nearly to the top of the drum, being preferably bent to one side just above the perforated diaphragm *i*, as shown in the drawings. To the inner end of the neck *h* is similarly secured by bolts *n* a steam-inlet pipe *o*, which is carried downward toward the bottom of the drum, being preferably cut off obliquely, as shown at *o'*, and terminating slightly above the bend, so that the steam shall be distributed with substantial uniformity against the perforated diaphragm *i*, notwithstanding the obstruction offered by the bend *l'* of the pipe *l*. As the steam is discharged against the perforated diaphragm the water of condensation is collected thereon and drops through the perforations *i²* therein into the chamber *k* beneath, while the dry steam passes to the top of the drum and thence downwardly through the discharge-pipe *l*.

It will be noted that the incoming steam is carried nearly to the bottom of the drum and close to the perforated diaphragm and that the outlet for the steam is located near the top of the drum at a point considerably remote from the termination of the inlet-pipe. The entrained water therefore tends to preserve its directional flow and to continue its downward course through the perforated diaphragm into the chamber beneath the same, while the lighter steam freed from the water rises at once to the top of the tank and escapes through the outlet, the mouth of which is located near the top. The dry steam does not pass through or in contact with any moisture-laden bars or baffle-plates from which it can take up water again and the point of its escape from the drum is so far remote from the point of inlet that it is a practical impossibility for water to be carried over with the steam. The improved separator is therefore not only simple in construction and compact, but is highly efficient in operation.

I claim as my invention—

1. A steam-separator, comprising a vertical, cylindrical drum, a steam-inlet extended downward centrally within the drum, a steam-outlet centrally located in the lower end of the drum and extended upwardly at one side, a perforated diaphragm extended

across the drum at the lower end thereof, and an outlet for the water of condensation below the same, substantially as described.

2. A steam-separator, comprising a vertical drum, a steam-inlet pipe extended downward centrally within the drum and having its lower end cut obliquely, a steam-outlet centrally located in the lower end of the drum and extended upward at one side, a perforated diaphragm located near the bottom of the drum, and an outlet for the water of condensation below the same, substantially as described.

3. A steam-separator, comprising a cylindrical shell, upper and lower heads having

flanged necks, a steam-inlet extension secured to the neck of the upper head, a steam-outlet extension secured to the neck of the lower head and bent to one side of the inlet extension, a perforated diaphragm near the lower end of the shell, and an outlet for the water of condensation in the lower head, substantially as described.

This specification signed and witnessed this 18th day of September, A. D. 1905.

RAGNAR L. KJERNER.

In presence of—

EDWIN H. ROBERTS,
FRANK STUMPF.