(No Model.)

N. CURTIS.

STEAM SEPARATOR.

No. 393,543. Patented Nov. 27, 1888.

Fig. 4.

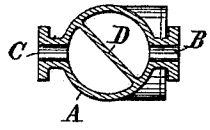


Fig. 1.

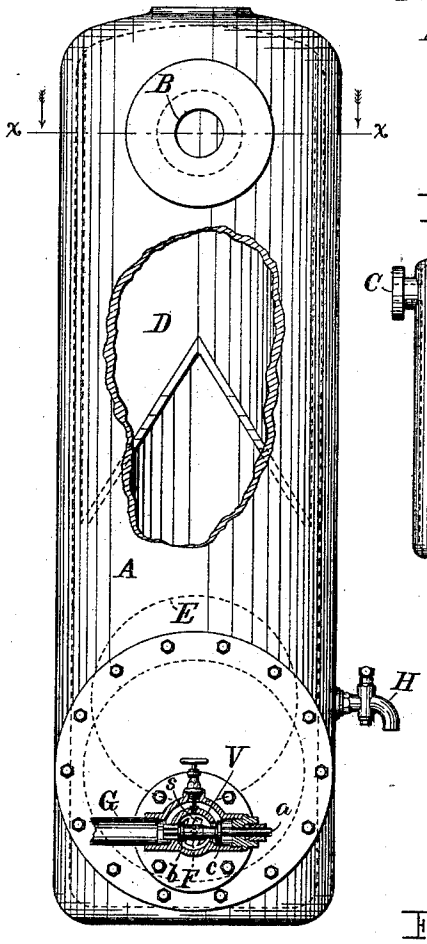


Fig. 2.

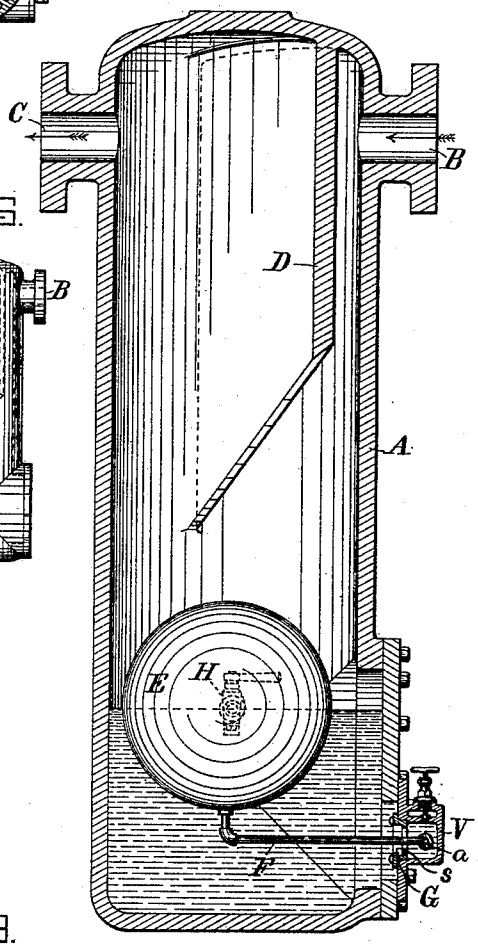


Fig. 5.

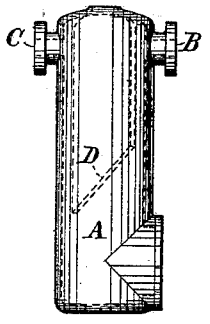
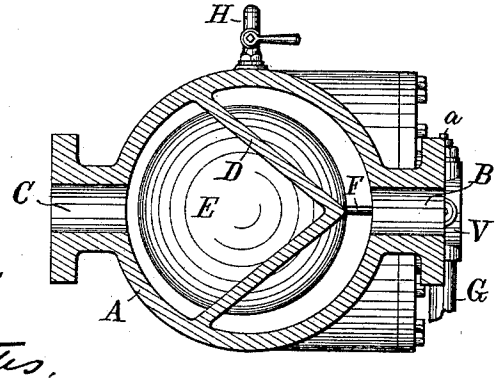


Fig. 3.



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UNITED STATES PATENT OFFICE.

NELSON CURTIS, OF BOSTON, MASSACHUSETTS.

STEAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 393,543, dated November 27, 1888.

Application filed February 29, 1888. Serial No. 265,702. (No model.)

To all whom it may concern:

Be it known that I, NELSON CURTIS, of Boston, in the State of Massachusetts, have invented an Improvement in Steam-Separators, of which the following is a specification.

The invention is applicable both to live and exhaust steam. When used with live steam merely, water will be separated therefrom; but grease and sediment, as well as water, may be separated from exhaust-steam, and, moreover, the grease may be preserved in an exceedingly pure condition.

The invention consists, first, in the employment, in connection with a separating vessel or chamber having provision for the ingress and egress of steam in its upper portion and an outlet for water in its lower portion, and also provided in said upper portion, in the path of the steam, with a substantially vertical inclined partition having its lower edge beveled, of a valve mechanism located in the water-outlet and operated by a float located in the lower part of the separating vessel or chamber beneath the partition, and, further, in the employment, in a steam separator thus provided with valve mechanism in the water-outlet controlled by a float, of a grease-cock located at or below the water-line of said float.

In the drawings, Figure 1 is an elevation of a separator embodying my invention. Fig. 2 is a vertical section. Fig. 3 is a plan on line *x x* of Fig. 1. Figs. 4 and 5 are diagrams representing a modification.

A is the shell or casing. B is the steam-inlet passage, and C is the steam-outlet passage.

The shell or casing A is oblong in shape, and when in use is placed on one end, so that the steam-passages B and C communicate with the chamber within the shell near the top.

D is the deflector, cast in one piece with the shell or casing. As shown at Figs. 1 and 3, the deflector has two operating plates or faces meeting at an angle in front of the steam-inlet, and each plate extends downward and is beveled at the bottom, as shown in Fig. 2. A single deflecting plate or face, however, extending across or substantially across the chamber at substantially the same inclination to the path of the steam entering from passage B that either face of the deflector D makes with that path, may be used. This modification is shown in diagram at Figs. 4 and 5.

E is a float within the shell. It is connected by a tube, F, with a valve mechanism, V, in the water-outlet G.

The particular valve mechanism shown is not essential to my invention. It may be described, however, as consisting of a hollow stem, *a*, carrying two balancing-valves, *b c*, and rigidly secured to the end of the tube F, which passes through the oblong diagonal slot *s*, which is in a perforated partition or diaphragm in the outlet-pipe G. When the float E moves in the shell, it gives motion to the tube F, which in turn rocks the stem *a;* but since the movements of the tube F are governed by the slot *s* the valves *b* and *c*, rocking with the stem *a*, will acquire an endwise motion in addition to their rocking motion, and will leave or take their seats accordingly as the float moves up or down.

H is a grease-cock located substantially at the water-line of the separator.

Live steam entering the chamber or the interior of the shell or casing A strikes against either plate or operating-face of the separator D, and is by it deflected, and is finally compelled to pass down beneath the deflector before making its exit through steam-passage C. Water separating from the steam on either plate is carried for the most part by its momentum out of the direct current of the steam to the corner or angle formed by the plate and the inner wall of the shell, and thence by gravity it falls to the bottom of the chamber. Such water as trickles directly down the surface of the plate has a tendency by cohesion to run along the beveled edge of the plate to the same corner, and is less liable to be again taken up by the steam and carried to the steam-exit passage than it would be if the lower edge of the plate were not beveled, but were square to the interior wall of the shell. When the water thus separated from the steam raises the float sufficiently, the valve in the water-outlet is opened and the water discharged.

The operation thus far, it is obvious, is the same with exhaust-steam. Grease and sediment, as well as water, will flow out through the water-outlet when the float rises sufficiently. The grease-cock H, however, permits the oil or grease to be drawn off from the top of the water at desired intervals; but if not

drawn off through the cock the valve mechanism, operated by the float, will allow it to run off through the water-outlet, so that under no circumstances will it re-enter the steam current. It is not desirable, however, to let the grease or oil pass out with the water, for well-known reasons. Moreover, by the use of the cock H, placed, as described, above the level of the water-outlet controlled by the float, exceedingly pure oil may be obtained and drawn off at will, while minute particles of metal and other sediment taken up in the work of a steam-engine will settle to the bottom of the separator below the level of the water-exit.

I claim—

1. A steam-separator consisting of a vertical oblong shell having provision near the top for the ingress and egress of steam and near the bottom an outlet for water, and provided also in its upper interior portion in the path of the steam with an inclined vertical partition beveled at its lower edge, and in its lower interior portion beneath said partition with a float, and a valve mechanism in said water-outlet connected with said float, substantially as described.

2. A steam-separator consisting of a vertical oblong shell having a steam-inlet and a steam-outlet near the top and a water-outlet near the bottom, and provided also with a partition or deflector in its upper interior portion between the said steam-inlet and the said steam-outlet, a float in the lower interior portion, valve mechanism in said water-outlet connected with said float, and a grease-cock at or below the water-line of said float, substantially as described.

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