(No Model.) 2 Sheets—Sheet 1.

W. J. BALDWIN.

GREASE SEPARATOR.

No. 578,708. Patented Mar. 16, 1897.

Fig. 1.

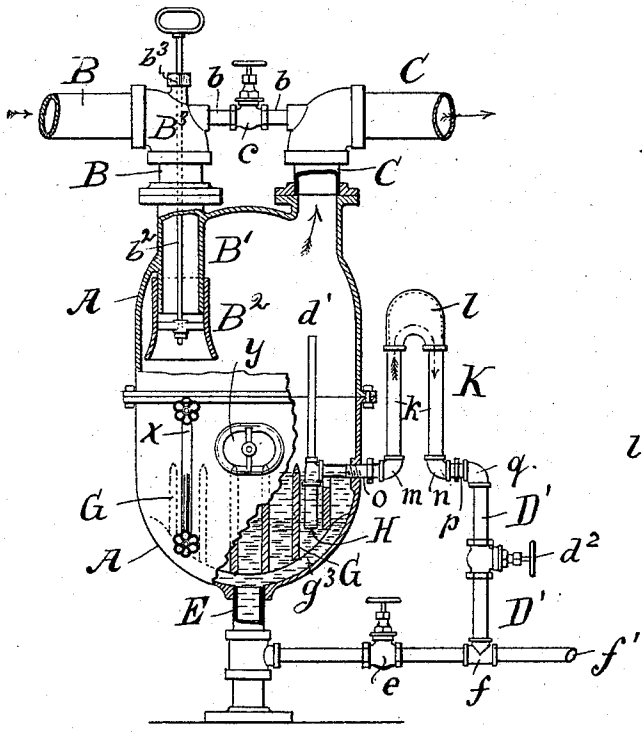
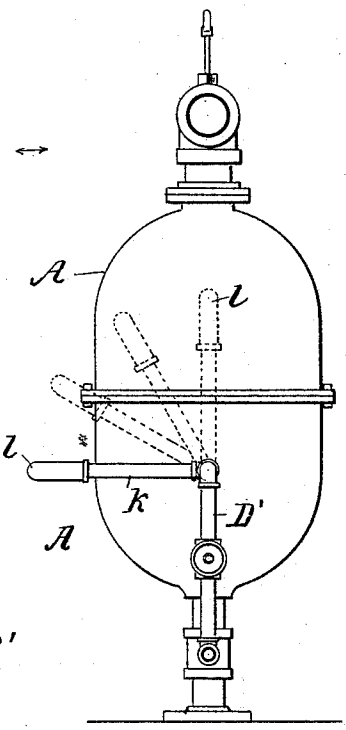


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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GREASE SEPARATOR.

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Fig. 4.

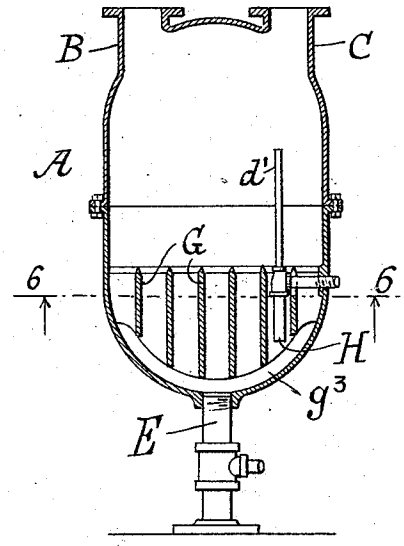
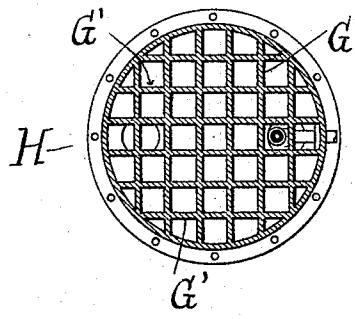


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM J. BALDWIN, OF BROOKLYN, NEW YORK.

GREASE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 578,708, dated March 16, 1897.

Application filed April 30, 1896. Serial No. 589,651. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. BALDWIN, a citizen of the United States, and a resident of the city of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Grease-Separators, of which the following is a specification.

My invention relates to improvements in grease-separators.

I have discovered that when the exhaust-steam and condense-water, as from a system of heating apparatus, are returned to a boiler after passing through a grease-separator it is desirable to so construct the grease-separator that a portion of the exhaust-steam and condense-water can be returned directly back into the boiler without passing through the grease-separator, so that at those times a small quantity of grease may be carried into the boiler, for my experience has demonstrated that, especially with those waters which form hard scale, the presence of a little grease in the boiler is very beneficial, because it prevents the scale from adhering so firmly to the boiler as it does if all the grease is removed.

Therefore it is the first object of my invention to provide a grease-separator so constructed that the operator may occasionally send a part of the condense-water and steam directly back into the boiler without its passing through the grease-separator.

In the second place the invention consists in providing the grease-separator with adhesive surfaces, the lower parts of which are submerged below the normal level of the water, in order that as the water-level is from time to time depressed a little, as the successive puffs of steam enter, the grease, or some of it, may be caught on these surfaces, to be washed off as the wave rises again. I prefer to form these surfaces as bars arranged at angles with each other, so as to form cells of comparatively small capacity and connected only at the bottom by openings of small area. This arrangement is especially useful in grease-separators on ships, for it prevents the rolling of the ship from materially changing the general water-level in the separator and diminishing the danger of shipping some of the water into the outlet-pipe before the grease is separated.

In the third place the invention consists in equipping the grease-separator with an adjustable discharge-pipe or overflow, whereby the normal water-level in the separator can be altered at will, so as to obtain the best results.

In the fourth place the invention consists in an adjustable inlet-pipe by which the lower end of the same can be brought nearer to or removed farther from the level of the water in the separator, so as to prevent spray from rebounding into the outlet-pipe.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a broken sectional elevation of one form of the grease-separator. Fig. 2 is an elevation indicating different positions of the adjustable overflow. Fig. 3 is a plan, and Fig. 4 a vertical section to illustrate the arrangement of the adhesive surfaces.

A is the shell of the grease-separator, preferably cast in an upper and a lower part and the parts bolted together, as shown.

B is the inlet for exhaust-steam, and C the outlet, connected with a heating apparatus. (Not shown.) Said inlet-pipe B projects down into the shell A, and B′ and B^2 is a bell-mouthed pipe sliding over pipe B and raised and lowered by the rod b^2, which works through a stuffing-box b^3 on the elbow B^3, as shown. Said rod b^2 is connected at its lower end to the bar b^5. Thus the pipe B^2 can be lowered or raised to the position which gives the best results under any circumstances.

D is an overflow controlled by valve d^2, and E a washout controlled by valve *e*. Said pipes D and E are preferably brought together at a T *f*, and go by pipe *f′* to the drain or other receptacle.

H is a stationary pipe descending below the water-level with open end and connected above with the overflow D, and *d′* is an air-pipe rising from the top of H with an open end and serving to equalize the pressure on the liquid in pipe H and prevent siphonage.

The aforesaid inlet B and outlet C are connected by the by-pass *b b*, which is controlled by the valve *c*. By occasionally opening valve *c* a part of the condense-water and steam, with their quota of grease goes directly from inlet B to outlet C and to the heating apparatus and boiler. When in the judgment of the operator a sufficient quantity of

grease has gone into the boiler, valve *c* is closed, and thereafter all the condense-water and steam go through the shell A, and the grease is extracted until such time when in the judgment of the operator it is desirable to again let a little grease into the boiler.

G G′ are adhesive surfaces which are very simply made, as bars that are cast with the shell A are preferably arranged at right angles to each other, so as to form cells, Fig. 3, and these cells are connected only at the bottom by the relatively small openings g^3. When the vessel rolls, the water cannot pass through these small passages g^3 sufficiently rapidly to materially affect the general water-level in the separator, and are positioned so that their lower parts will be below the normal water-level in the grease-separator, as determined by the height of the overflow. I prefer to have the tops of said surfaces G a little above the normal water-level and to bevel the tops, as shown. As each puff of steam enters the grease-separator some part of the water will be momentarily forced down below the normal water-level, exposing a greater part of the surfaces of some of the bars G, and some of the grease will collect on these surfaces and trickle down. After the puff the water will rise again, and thus waves will be generated which will alternately rise and fall against the bars G, and of course even if the water were still the grease would trickle down the bars into the water, while the wave washes the grease off the bars.

I prefer an overflow which can be adjusted to different heights, and thereby the normal level of the water in the shell A be regulated at will.

K is a loop or inverted **U** formed of short pipes *k k* and antisiphoning return bend *l*. Pipes *k k* thread into elbows *m n*, elbow *m* threading on pipe *o*, which connects with pipe H, Fig. 1, and elbow *n* threading on pipe or nipple *p*, which connects by elbow *q* with the pipe D′, leading to pipe *f*′. Said elbows *m n* are normally connected with the pipes or nipples *o p* by any suitable packed water-tight joints, and said nipples *o p* form the pivots about which the loop K turns, the packed joints preventing leakage. When the loop is horizontal, as indicated by solid lines in Fig. 2, the lowest water-level in the separator is attained, for then the bend *l* is at the level of the pipes *o p*, and therefore further depression of the bend *l* does not affect the level of the water in the separator. By raising the loop to other positions, as indicated by the dotted lines in Fig. 2, the water-level will be correspondingly raised in the separator.

X is a gage to show the water-level, and Y a plate or manhole-cover to give access to the interior.

The operation is obvious from the foregoing specification and requires no further description.

Now, having described my improvements, I claim as my invention—

1. The combination with a grease-separator, of a vertically-adjustable inlet connection adapted to be moved toward and from the water-level in the separator, and an outlet connection, a channel connecting the same, and a valve controlling said channel, substantially as and for the purpose described.

2. The combination with a grease-separator, of an inlet connection adapted to direct the incoming fluids upon the surface of the water in the separator and an outlet connection, an overflow, and adhesive surfaces arranged in the grease-separator partly below the normal water-level therein, substantially as described.

3. The combination with a grease-separator, of an overflow thereon adapted to rotate in a vertical plane and be set in different levels, substantially as described.

4. The combination with a grease-separator, of adhesive surfaces arranged partly below the normal water-level therein, and an adjustable overflow adapted to vary the normal water-level within limits, substantially as described.

5. In a grease-separator, a shell divided internally into a plurality of cells, openings of relatively small area connecting contiguous cells near the bottom, and an inlet connection adapted to project the incoming fluid upon the surface of the water in the separator, substantially as described.

6. In a grease-separator, an adjustable inlet-pipe having its mouth above the water-level in the separator and adapted to be raised and lowered as desired and project the incoming fluids upon the surface of the water in the separator, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 14th day of March, 1896.

WILLIAM J. BALDWIN.

Witnesses:
ABM. VAN SANTVOORD,
HENRY V. BROWN.