

No. 680,583.

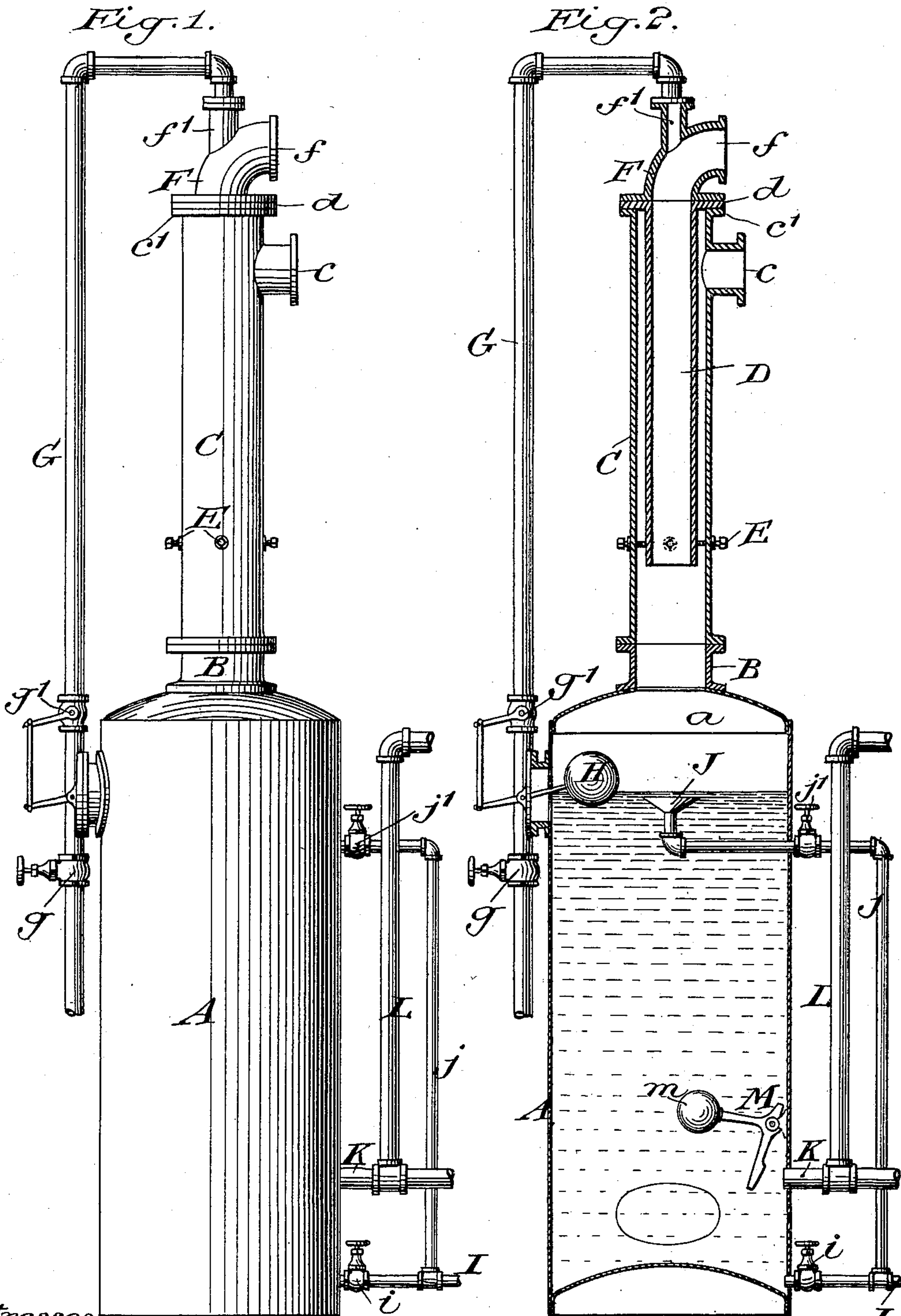
Patented Aug. 13, 1901.

P. H. GRIMM.

COMBINED STEAM CONDENSER AND OIL SEPARATOR.

(Application filed Oct. 27, 1900.)

(No Model.)



Witnesses:  
George Barry Jr.  
Fred Haynes

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# UNITED STATES PATENT OFFICE.

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## COMBINED STEAM-CONDENSER AND OIL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 680,583, dated August 13, 1901.

Application filed October 27, 1900. Serial No. 34,539. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL H. GRIMM, a citizen of the United States, and a resident of Glencove, in the county of Nassau and State of New York, have invented a new and useful Improvement in a Combined Steam-Condenser and Oil-Separator, of which the following is a specification.

My invention relates to an improvement in combined steam-condensers and oil-separators, and has for its objects to provide a very simple structure the parts of which may be readily cleaned, in which the feed-water may be heated to a very high degree by the condensation of the steam, and in which the body of water will not be agitated after it has condensed the steam, thus permitting the oil or grease which is contained in the steam to rise to the top of the body of water, where the said oil or grease may be drawn off.

A still further object is to provide means for automatically cutting off the supply of feed-water to the condenser and for cutting off the water from the condenser to the boiler when water has been drawn off to a point which would endanger the feeding of the oil or grease on its surface to the boiler.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents the condenser in side elevation, and Fig. 2 represents the condenser in vertical central section.

The tank for containing the condensed steam and heated water is denoted by A. A flanged neck B is secured to the upper head *a* of the tank, and this flanged neck is surmounted by a flanged pipe C. This flanged pipe C is provided with an outlet *c* for any surplus steam which may not be condensed by the feed-water. An interior pipe D is located within the pipe C and is supported at its upper end by means of a flange *d*, which rests upon the upper flange *c'* of the exterior pipe C. The interior pipe D may be accurately spaced from the exterior pipe C by means of a plurality of adjusting-screws E, carried by the pipe C, and which engage the lower end of the interior pipe D. A coupling F surmounts the interior pipe D, which coupling has a large opening *f* for the admis-

sion of the waste steam and a small opening *f'* for the attachment thereto of the primary feed-water pipe G. This feed-water pipe G is provided with the usual admission-valve *g*. An automatic shut-off valve *g'* is located in the primary water-feed pipe G, which valve is under the control of a float H, so that when the water within the condenser rises to a predetermined height it will shut off the further admission of water through the main inlet-pipe G. A waste-pipe I opens into the lower end of the tank A, and it is provided with the usual shut-off valve *i*. A strainer J is located within the tank A in proximity to the high-water mark in the said tank, which strainer is provided with a pipe *j*, leading to the waste-pipe I. This pipe *j* may be provided with the usual controlling-valve *j'*.

The pump-feeding pipe is denoted by K, and it leads from the tank A a short distance above its lower end. This pipe K has connected thereto an overflow-pipe L, which leads upward to a point in proximity to the top of the tank A.

An automatically-operated float-valve M is mounted within the tank A in position to shut off the supply of water to the pump-feeding pipe K a short time before the surplus of the body of water within the tank reaches the said pipe. This will prevent the admission of any oil or grease which may have been contained in the steam which was condensed within the tank from passing into the said pump-feeding pipe K. The float *m* of the said valve will keep the valve at all times away from the pipe when the water is at a higher level.

The operation of my improved apparatus is as follows: The waste steam is admitted through the opening *f* in the coupling F and passes therefrom downwardly through the interior pipe D and into the tank A, filling the same, and then passes upwardly through the annular space between the inner and outer pipes D and C and out through the outlet *c*. The valve *g* in the primary feed-water-supply pipe G is opened, thus permitting the water to enter the coupling F through the small inlet-opening *f'*. The entering water will thus be caused to mix with the steam as it passes downwardly through



the interior pipe D. The mixed water and steam will form a perfect spray by the time it reaches the bottom of the interior pipe D, where it will be brought into contact with  
 5 the steam which was liberated in the tank below and which seeks its way out through the outlet c. As the heated water and condensed steam accumulate in the tank the oily matter floats to the top, and periodically the  
 10 water-level can be so regulated as to float this oily matter off through the strainer J by opening the valve  $j'$  in the pipe  $j$ , which leads to the waste-pipe I. To prevent the possibility of drawing the water so low as to cause  
 15 the floating impurities to enter the pipe K, which leads into the pump, the float-operated valve M is provided, which valve operates in the manner hereinbefore set forth.

This apparatus does not create a vacuum  
 20 nor even a partial vacuum on the pistons of the engine supplying the exhaust-steam to it, as the outlet c is at all times in open communication with the interior of the tank.

It will be seen that the structure is very  
 25 simple, thus making all the parts of the apparatus readily accessible for cleaning. This is especially important in localities where the water contains large quantities of mineral matter. It will be further seen that this  
 30 apparatus does away with the use of filter-beds.

The degree of heat in the water can be regulated absolutely, for the reason that the combined water and steam which passes downwardly through the interior pipe D does not  
 35 come in contact with the whole body of water within the tank, but only strikes the surface thereof. It will therefore be seen that the heat in the water is entirely dependent upon  
 40 the amount of cold water which is combined with the waste steam. As the water is not agitated after it enters the tank A, the oily matter contained therein readily floats to the surface, where it may be drawn off at pleasure.

45 It is evident that slight changes might be resorted to in the form and arrangement of the several parts without departing from the

spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth; but

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What I claim is—

1. A steam-condenser comprising a tank, a steam-outlet pipe extended upwardly therefrom having a free opening to the exterior and an interior mixing-pipe located within  
 55 the steam-outlet pipe, the said interior mixing-pipe having a steam-inlet and a feed-water inlet at its upper end, substantially as set forth.

2. A steam-condenser comprising a tank, a  
 60 steam-outlet pipe extended upwardly therefrom and having an open communication with the exterior at or near its upper end and a mixing-pipe located within the steam-outlet pipe and having a steam-inlet and a feed-  
 65 water inlet at its upper end, the lower end of the said mixing-pipe being located above the high-water level in the tank, substantially as set forth.

3. A steam-condenser comprising a tank, a  
 70 steam-outlet pipe extended upwardly therefrom and having an opening communicating with the exterior at or near its upper end, a mixing-pipe located within the steam-outlet pipe and a coupling communicating with the  
 75 mixing-pipe and having steam and feed-water inlets therein, substantially as set forth.

4. In a steam-condenser, a tank, a steam-outlet pipe extended upwardly therefrom  
 80 and having an opening communicating with the exterior at or near its upper end, and a mixing-pipe located within the steam-outlet pipe with its lower or discharge end spaced a distance above the lower end of the steam-outlet pipe, substantially as set forth.

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In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 8th day of October, 1900.

PAUL H. GRIMM.

Witnesses:

FREDK. HAYNES,  
 C. S. SUNDGREN.