No. 787,365. PATENTED APR. 18, 1905.

J. FRANEY.

STEAM AND OIL TRAP.

APPLICATION FILED SEPT. 27, 1902.

2 SHEETS—SHEET 1.

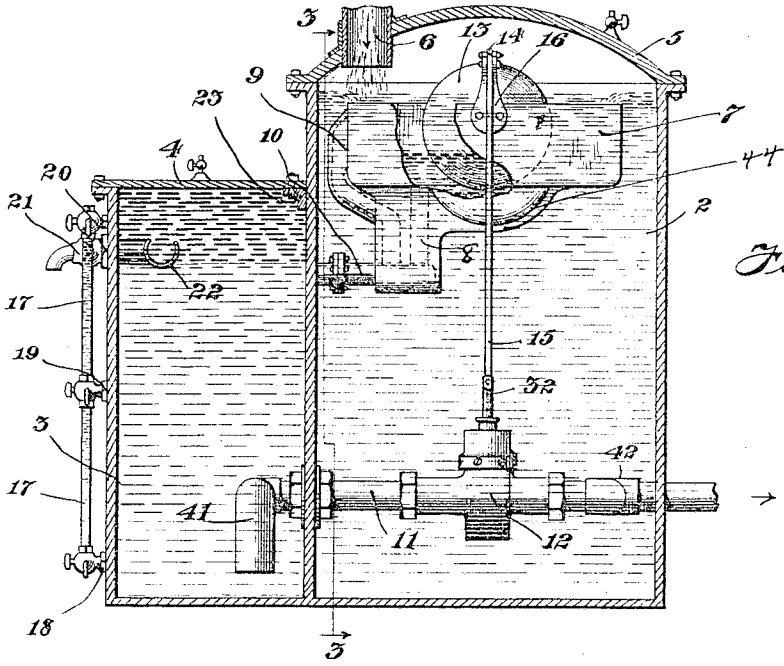


Fig. 1

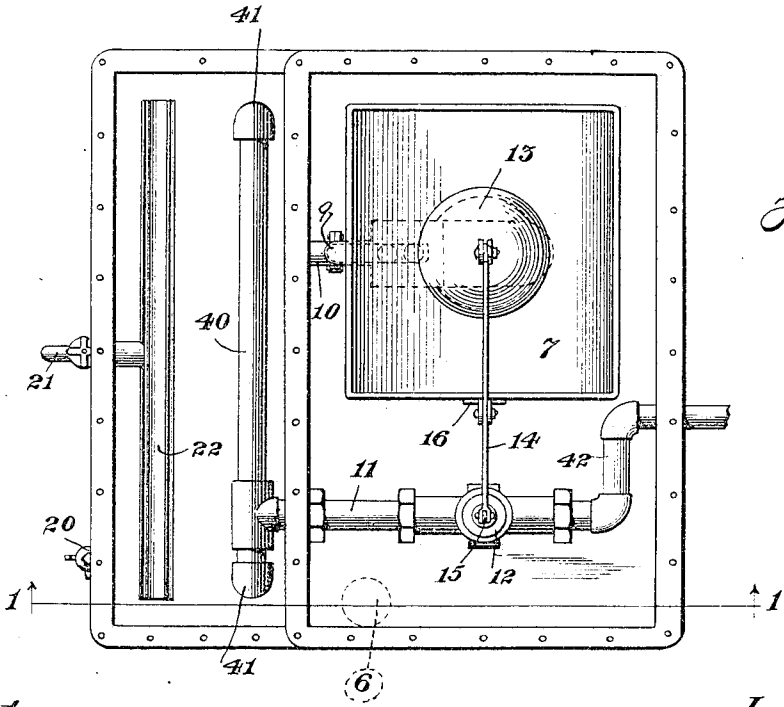


Fig. 2

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2 SHEETS—SHEET 2.

Fig. 3

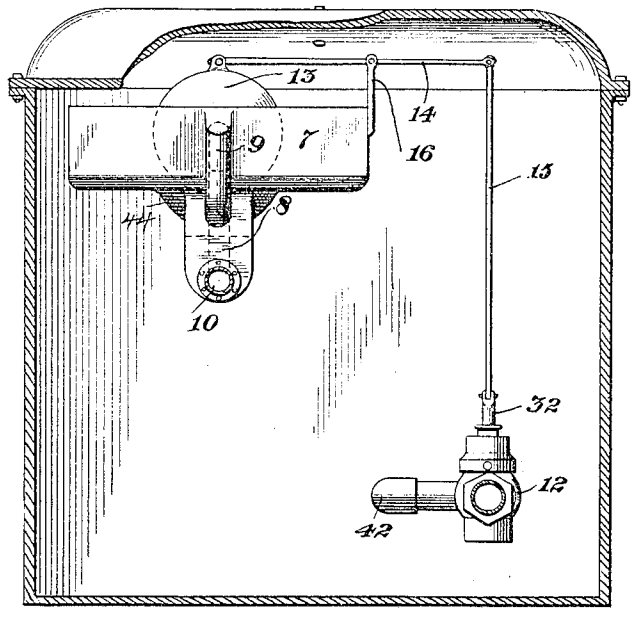


Fig. 5

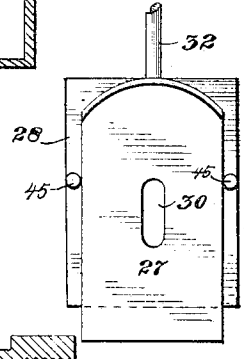
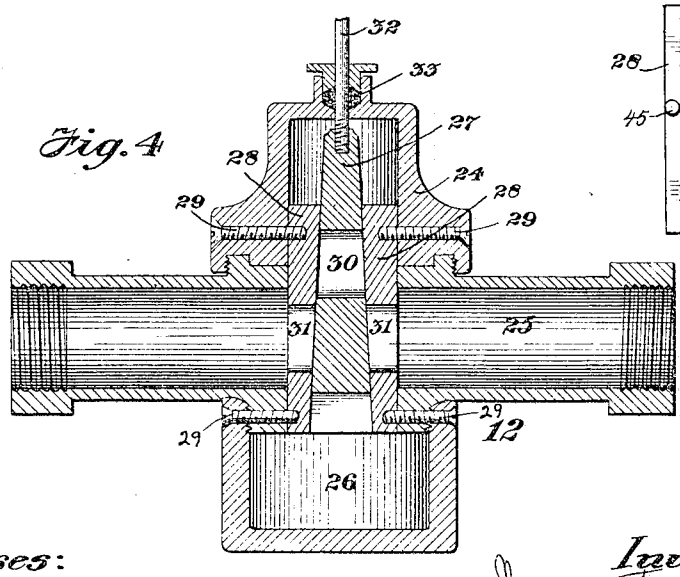


Fig. 4



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No. 787,365. Patented April 18, 1905.

UNITED STATES PATENT OFFICE.

JAMES FRANEY, OF CHICAGO, ILLINOIS.

STEAM AND OIL TRAP.

SPECIFICATION forming part of Letters Patent No. 787,365, dated April 18, 1905.

Application filed September 27, 1902. Serial No. 125,017.

To all whom it may concern:

Be it known that I, JAMES FRANEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Steam and Oil Traps, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a steam and oil trap, and comprises means for separating the oil from the water of condensation in connection with the exhaust of steam-engines, heating systems, and with any apparatus where there is exhaust-steam.

One common use of my invention is in connection with the receivers of compound engines; but its field of usefulness is no wise so limited.

The invention has for its objects the provision of a self-contained structure or apparatus capable of ready application to any steam-using system as above outlined and which when so applied will effectively perform its desired functions and will continue so to do from day to day without becoming clogged or stopped up, as is common in the devices heretofore employed for similar purposes.

Further objects of the invention are the provision of a device for the purpose set forth that is simple to construct, cheap to manufacture, and that is efficient and durable in operation.

To the accomplishment of these and such other objects as may hereinafter appear my invention comprises the apparatus and parts hereinafter described, and particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, in which the same reference characters are used throughout to designate like parts, and in which—

Figure 1 is a sectional elevation of my invention on the line 1 1 of Fig. 2. Fig. 2 is a plan view with the covers removed. Fig. 3 is a sectional elevation on the line 3 3 of Fig. 1. Fig. 4 is a sectional elevation of the discharge-valve, and Fig. 5 is a detail view of the valve parts.

In the drawings, 2 indicates the receiving-chamber and 3 the separating-chamber.

4 and 5 are the covers of the separating and receiving chambers, respectively, and 6 is the inlet-pipe or exhaust-pipe through which the water, oil, and exhaust-steam enters the receiving-chamber 2.

7 is a cup consisting, preferably, of a casting over the rim of which the oil and water flow as the receiving-chamber fills.

8 represents an outlet-passage in the bottom, and 9 a similar passage in the side, of the cup 7 and formed in the said casting, which permit the oil and water to pass from the cup 7 to the separating-chamber 3 by means of the pipe 10. The pipe 10 is screwed into the casting at one end and into an aperture in the partition between the said chambers at the other and is provided with coupling-flanges midway between its ends. The cup 7 is thus supported. This cup and the outlets comprise an overflow for the receiving-chamber.

11 is an outlet-pipe for the purpose of drawing off the water in the separating-chamber when the valve 12, situated in said pipe, is opened. A float 13 is connected by the lever 14 and the connecting-rod 15 with the valve 12 for the purpose of opening and closing said valve, and thus controlling the said valve. The lever 14 is supported upon the wall of the cup 7 by the post or bracket 16. The ball 13 is shown in mid-position in the drawings, in which case the valve 12 is partially open; but in its lowest position it fits within the depression 44 in the bottom of the cup 7.

A glass gage 17 is located upon the side of the separating-chamber for the purpose of determining the relative quantity of oil and water in the separating-chamber, said gage being connected with the separating-chamber by three passages 18, 19, and 20, in which are placed the usual cocks or valves.

21 is a valve or faucet for the purpose of drawing off from time to time the oil that may accumulate in the separating-chamber.

The mixed oil and water is discharged

through the exhaust or inlet pipe 6 into the receiving-chamber 2. When the contents of the receiving-chamber becomes high enough, it overflows into the cup 7 and thence from the cup 7, by means of the outlets 8 and 9 and pipe 10, into the separating-chamber 3. The oil in the receiving-chamber 2 tends to rise to the surface of the water therein, so that the liquid that flows into the cup 7 contains a large per cent. of oil, and all of the oil is thus sure to be drawn off. When the separating-chamber is filled to its full capacity, the contents of the cup 7 being no longer able to flow therein slowly rises and lifts the float 13. The valve 12 in the discharge-pipe 11 is then opened by means of the lever 14 and the connecting-rod 15, as more clearly shown in Fig. 3. When the valve 12 is thus opened, the water of the separating-chamber 3 is drawn off by means of the discharge-pipe 11. The discharge-pipe 11 is provided in the separating-chamber with a transverse portion 40, having the downwardly-turned ends 41, whereby it is fed from the bottom of the separating-chamber 3, and thus draws off the clear water from said chamber, the oil having separated therefrom and risen to the top, as indicated in Fig. 1. As the quantity of the water in the separating-chamber 3 is reduced the pipe 10 discharges the cup 7 thereinto, which permits the float 13 to descend, and by means of the lever 14 and the connecting-rod 15 the valve 12 is closed. This operation prevents any further discharge from the separating-chamber 3 until the cup fills again to raise the float 13, which will as before open the valve 12 and permit a portion of the water in the separating-chamber 3 to escape. The floor of the cup 7 is substantially level with the top of the separating-chamber, so that all the oil and water of cup 7 will discharge thereinto, and even that in the depression 44 will likewise be forced out and discharged by the float 13. The tendency is of course for the oil to rise to the surface of the water, and in prior steam-traps they become foul and clogged within a short time from this source; but in my arrangement I effectually trap the polluted water, so that it cannot clog and menace the operativeness of the device and so that the oil is continually removed from the steam-trap. The side outlet 9 of the cup provides, further, for the sure discharge of the oil into chamber 3.

By reference to the glass gage 17 the height of the oil in the separating-chamber may be readily determined, and, when desired, the valve 21 may be operated to withdraw the same. This would ordinarily not be done more than once or twice per day.

The faucet 21 is provided with a trough 22, extending across the top of the separating-chamber for the purpose of guiding the oil thereto, as more clearly shown in Fig. 2.

The covers 4 and 5 are held upon the chambers 3 and 2, respectively, by bolts, as shown in Fig. 1, except the inner edge of cover 4, which is secured by screw-studs screwed into an angle-support 23.

The valve which I prefer to employ in the discharge-pipe 11 is the gate-valve shown in Fig. 4. It is composed of the following parts: 24, 25, and 26 together constitute the casing of the valve, 25 being a tube-shaped piece threaded at each end to receive the pipe 11 and having upon two opposite sides thereof a threaded ring adapted to receive the top cap 24 and the base-cap 26. The caps 24 and 26 are hollow to permit the wedge or gate 27 to be raised and lowered. The wedge 27 has a threaded socket in the apex thereof to receive the end of the connecting-rod 32, which passes through a stuffing-box 33. The wedge-shaped pieces 28 have oblong holes or openings 31, and the wedge 27 has a corresponding hole 30. The wedge 27 is raised and lowered by the valve-rod 32 and the connecting-rod 15 between the pieces 28. When the float is in the depression 44, the wedge or gate 27 is raised to its utmost and the hole 30 therein is out of alinement with the holes 31 in the pieces 28, and the valve is closed. When the wedge 27 is lowered, the hole 30 therein overlaps the holes 31 in the pieces 28, thus forming a passage through the tube 25, and the valve is opened. Under ordinary circumstances the gate 27 is not lowered to its fullest extent; but in case of a rush of water into the receiving-chamber the cup 7 would suddenly fill and the float would be lifted to such an extent as to depress gate 27, so as to fully open the hole, and thus allow a faster emptying of chamber 3. The lower cap 26 may be readily removed to replace the pieces 28 and the gate or wedge 27. Pins 45 on the face of plates 28 guide and preserve the proper location of gate 27.

It is obvious that the outer end of the outlet-pipe may be carried out at any point of the side of the receiving-chamber by merely using a section 42 of pipe of any desired length. The inlet 6 may enter the receiving-chamber at the side or at any other desired point. The said chambers are preferably cast and are of suitable thickness to withstand the pressure to which they are subjected. It is evident that the interior of the device is subjected to the pressure of the exhaust-steam; but this in no wise affects the operation of the device as above outlined.

From the foregoing it will be apparent that I have produced a device in which the desired results are accomplished in a simple, effective, and expeditious manner and all by the employment of apparatus that is easy to construct, inexpensive to manufacture, and that is also durable and safe in operation. A trap for the oil is thus associated with the trap for

the mixed water of condensation and oil in such manner as to prevent the same from ever becoming foul or clogged, whereby the oil is never carried over into the boilers.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination with a receiving-chamber adapted to receive the mixed oil and water of condensation, of a separating-chamber in communication with said receiving-chamber in which the oil is adapted to separate from the water, a float in said receiving-chamber, and an outlet for said separating-chamber controlled by said float, and means for drawing off the oil from said separating-chamber, substantially as described.

2. In a device of the class described, the combination with a receiving-chamber connected with the passage for the exhaust-steam and adapted to receive the mixed oil and water of condensation, of a separating-chamber associated with said receiving-chamber and adapted to receive the overflow from said receiving-chamber, whereby any oil that may rise to the surface in the receiving-chamber is sure to flow into the separating-chamber, the oil being separated from the water in said separating-chamber, a float in said receiving-chamber, and an outlet for said separating-chamber controlled by said float, said outlet when opened being adapted to permit the escape of the water from said separating-chamber, and means for drawing off the oil from said separating-chamber, substantially as described.

3. In a device of the class described, the combination with a receiving-chamber connected with the exhaust and adapted to receive the mixed water of condensation and oil, of a separating-chamber associated with the said receiving-chamber in which the oil is intended to separate from the water, a cup in the upper part of said receiving-chamber and connected with the said separating-chamber, a float in said cup, and an outlet leading from the bottom of said separating-chamber and controlled by said float, substantially as described.

4. In a device of the class described, the combination with a receiving-chamber connected with the passage for the exhaust-steam and adapted to receive the mixed oil and water of condensation, of a separating-chamber associated with said receiving-chamber, an overflow leading from the receiving-chamber into the separating-chamber, a float in said receiving-chamber actuated when the separating-chamber is filled, an outlet for said separating-chamber and connected with the lower part thereof so as to draw the water therefrom, said outlet being controlled by the said float and arranged to be opened when the separating-chamber is filled, and means connected with the said separating-chamber for drawing off the oil, substantially as described.

5. In a device of the class described, the combination with a receiving-chamber adapted to receive the mixed oil and water, of a separating-chamber connected with said receiving-chamber by means of an overflow, the oil and water being separated in said separating-chamber, a float in said receiving-chamber and means controlled by said float for drawing off the water from the separating-chamber, other means for drawing off the oil from said separating-chamber and indicating means associated with the separating-chamber to show the depth of the oil therein, substantially as described.

6. In a device of the class described, the combination with a receiving-chamber adapted to receive the mixed oil and water, of a separating-chamber connected with said receiving-chamber by means of an overflow, the oil and water being separated in said separating-chamber, a float in said receiving-chamber and means controlled by said float for drawing off the water from the separating-chamber, other means for drawing off the oil from said separating-chamber and a glass gage connected with said separating-chamber to indicate the relative depths of the oil and water in the chamber, substantially as described.

7. In a device of the class described, the combination with a receiving-chamber connected with the exhaust and adapted to receive the mixed oil and water, of a separating-chamber associated with said receiving-chamber, a cup mounted in the upper part of said receiving-chamber and adapted to receive the overflow of said chamber when it fills with oil and water, said cup connecting with the said separating-chamber, whereby when the latter fills with oil and water the cup also becomes filled, a float in said cup adapted to be lifted when the separating-reservoir becomes filled and the liquid in the cup rises, an outlet-pipe connected with the lower part of said separating-chamber, a valve in said pipe, a lever with which said float is connected and a rod extending between said lever and said valve, whereby when the separating-chamber fills and the liquid in the cup rises the float is lifted and actuates the valve to open the said outlet which permits the water from the said separating-chamber to escape, a faucet connected with said separating-chamber near its upper portion and adapted when operated to draw off the oil from said chamber, and a gage connected with said separating-chamber to show the depth of oil therein, substantially as described.

8. The combination with a receiving-chamber for the mixed oil and water of condensation, of a second chamber connected with said receiving-chamber in which the oil is sepa-

rated from the water, an outlet leading from said second chamber to conduct the water therefrom, a valve normally closing said outlet, and means for automatically operating said valve to open said outlet when the fluid in said receiving-chamber reaches a predetermined depth, and means for withdrawing the oil from said second chamber.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

JAMES FRANEY.

Witnesses:
CURTIS B. CAMP,
ROBERT LEWIS AMES.