

No. 837,711.

PATENTED DEC. 4, 1906.

W. H. ODELL.

STEAM TRAP:

APPLICATION FILED JULY 18, 1908.

3 SHEETS—SHEET 1.

Fig. 1.

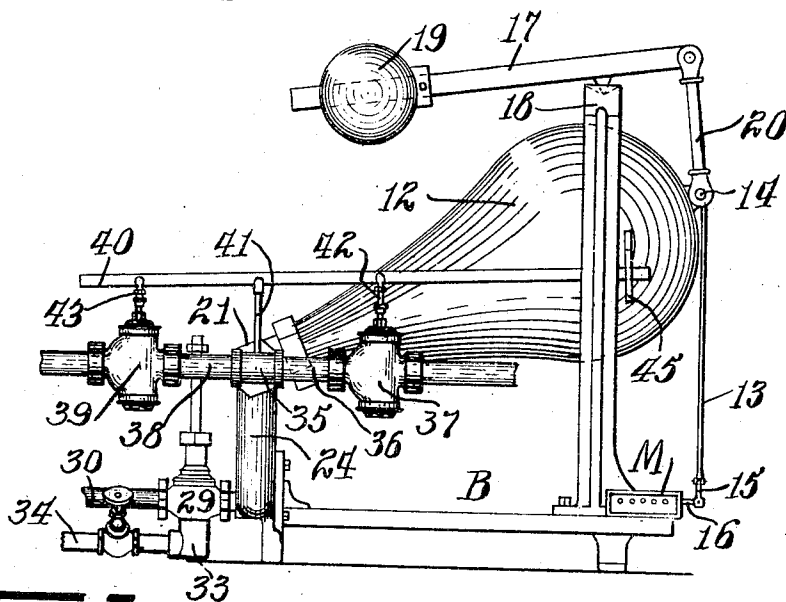


Fig. 3.

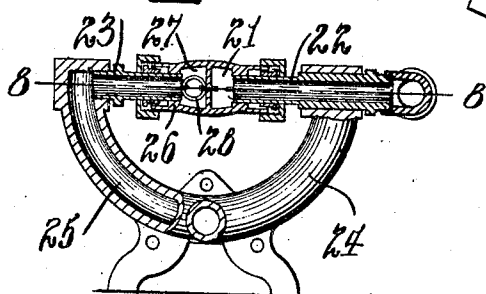
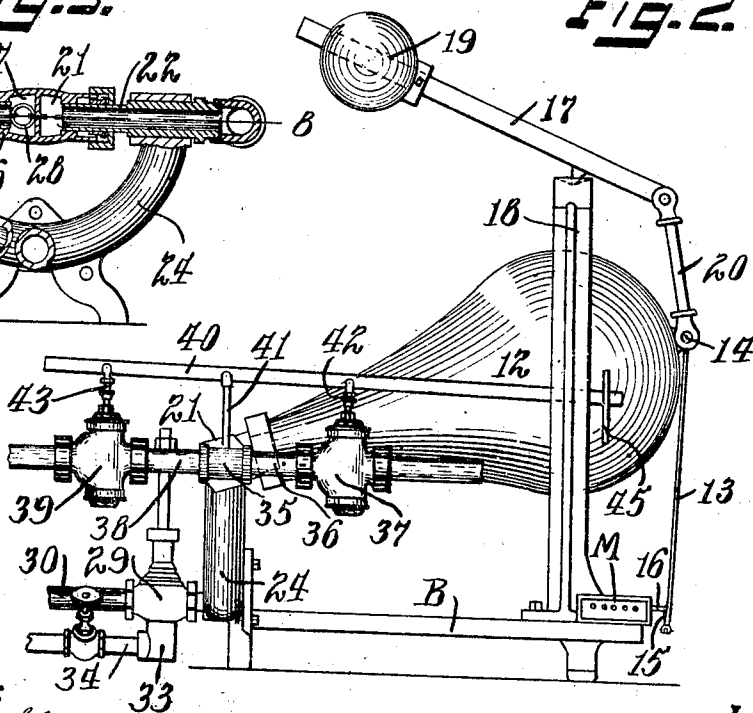


Fig. 2



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FIG. 4.

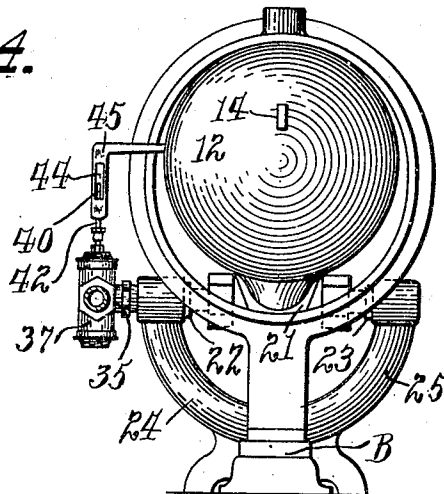


FIG. 5.

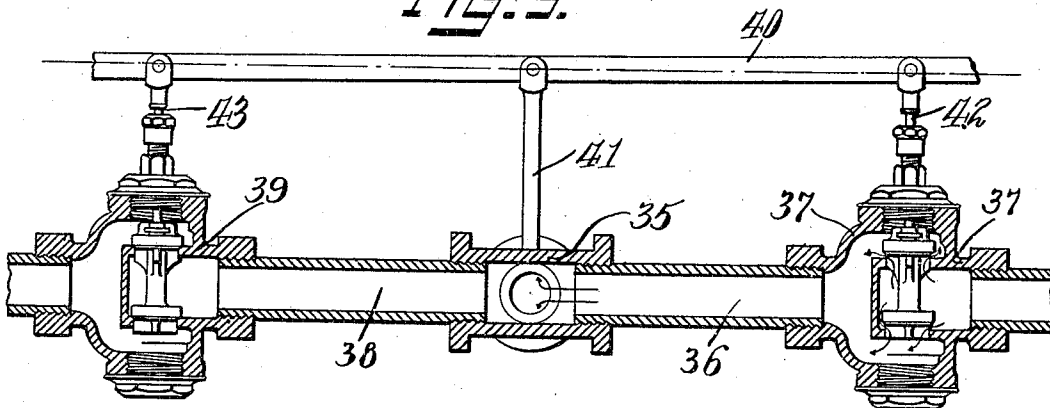
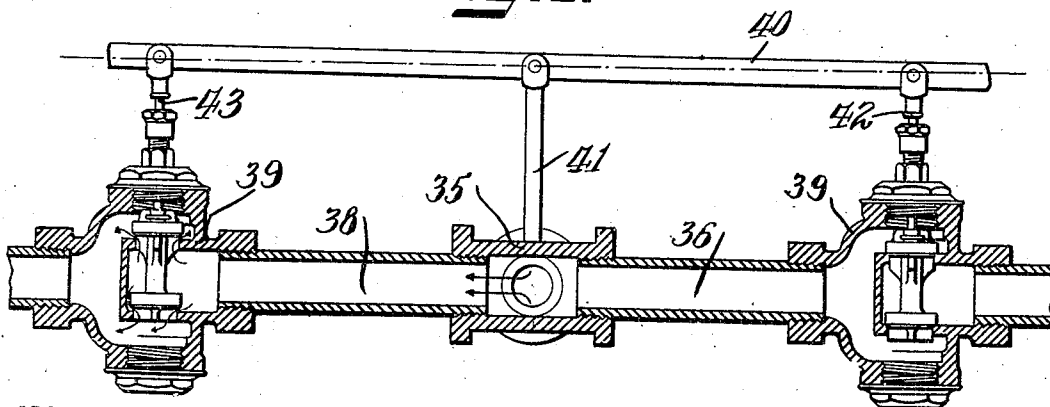


FIG. 6.



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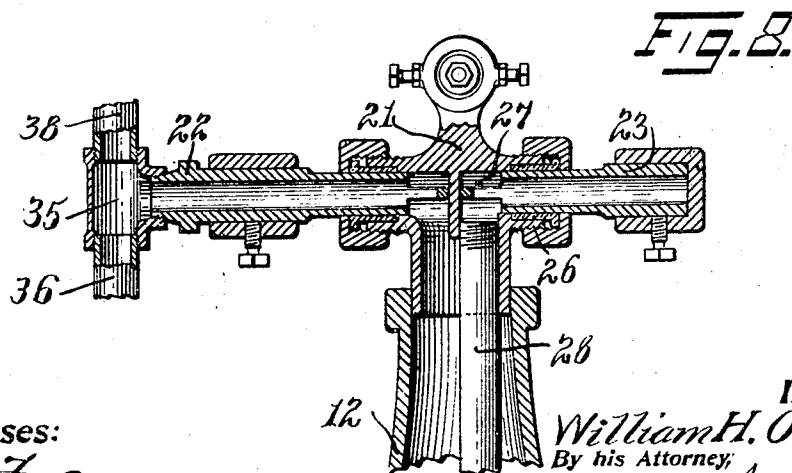
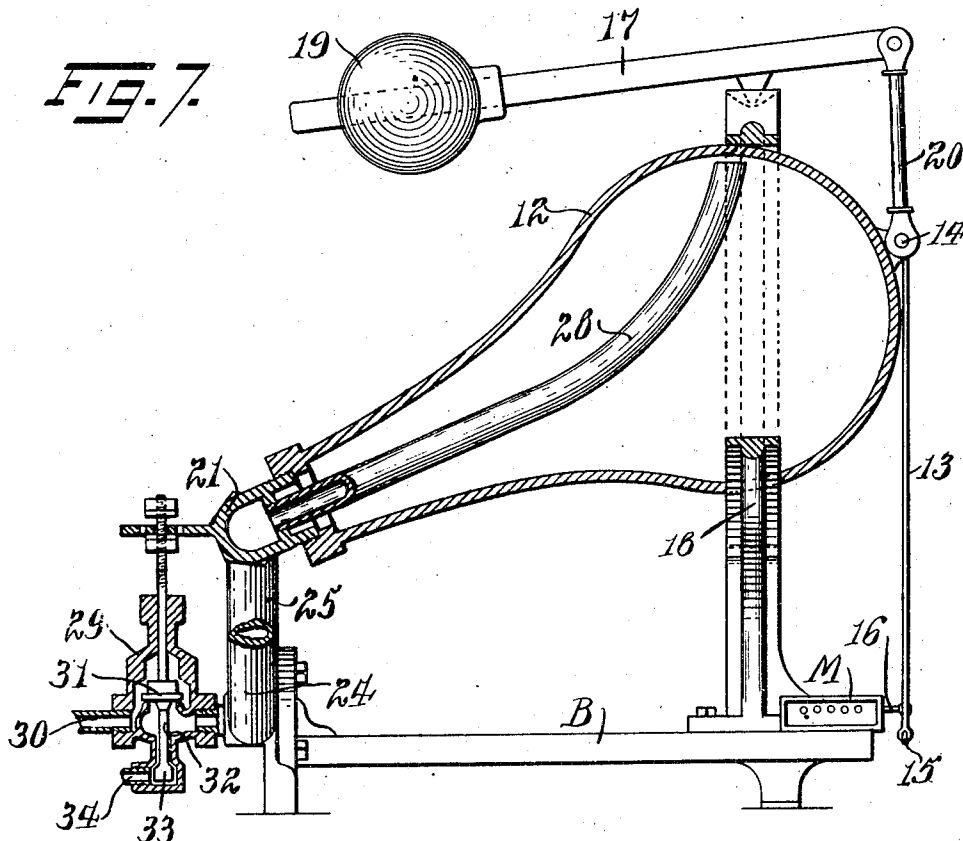
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STEAM TRAP.

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3 SHEETS--SHEET 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. ODELL, OF YONKERS, NEW YORK.

STEAM-TRAP.

No. 837,711.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed July 18, 1906. Serial No. 326,657.

To all whom it may concern:

Be it known that I, WILLIAM H. ODELL, a citizen of the United States, residing in Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Steam-Traps, of which the following is a specification.

This invention relates to devices generally known as "steam-traps," and has for its object, primarily, to measure or meter the amount of water of condensation that is returned through the trap.

A further object of the invention is to provide means for preventing such water of condensation from escaping into the outlet from the trap-reservoir from its supply-pipe without having first passed into the reservoir, and thereby been measured.

It is also an object of the invention to provide in connection with a steam-trap for returning water of condensation to the boiler improved means for controlling the inlet and outlet passages to the steam-trap, whereby back pressure or live steam from the boiler will be prevented from escaping through the outlet-pipe of the reservoir that leads into the boiler.

In the accompanying drawings, representing an embodiment of my invention Figure 1 shows the device in side elevation with the steam-trap in the filling position: Fig. 2 is a similar view, but with the trap or receiver in its lowered position and the regulating-valves correspondingly shifted. Fig. 3 shows in end elevation, partly in section, the admission and the discharge passages for the receiver. Fig. 4 is an end elevation of the parts shown in Fig. 1. Fig. 5 is a longitudinal section through the controlling-valves. Fig. 6 is a view similar to Fig. 5, but with the valves and lever in another position. Fig. 7 is a vertical sectional view, partly in elevation, through the receiver and certain controlling-valves therefor; and Fig. 8 is a section on the line 8 8 indicated in Fig. 3, showing a portion of the receiver.

While the present invention is applicable to any form of steam-trap that is lowered when containing a certain amount of water of condensation and then elevated after such water has been discharged, the invention is illustrated as applied to a form of steam-trap patented by Frank A. Littlefield on February 7, 1893, No. 481,486, and also patented

to the same inventor on January 30, 1894, No. 513,648.

In the construction shown there is a receiving vessel 12, suitably supported to be raised and lowered. When the receiver is elevated, it is connected to receive water of condensation until a suitable weight is overbalanced, whereupon the receiver will lower. In the latter position, by suitable automatic valve mechanism, the supply is cut off and an outlet-passage opened, whereby such water will find exit. Upon the vessel being emptied it will overbalance the weight and rise to its former position. A suitable form of register or meter M is arranged on the frame or base B of the apparatus and connected with the receiver by a rod 13, pivoted to the receiver at 14 and also pivoted to an arm 15, connected with the shaft 16 of the meter. Thereby the shaft of the meter is oscillated at each oscillation of the receiver, and such oscillations are caused to be registered or recorded by the meter M.

In the construction shown a lever 17 is pivoted on a frame member 18 above the receiver 12 and carries a weight 19 on its free end, preferably adjustable thereon. To the other end of the lever 17 is pivoted a link 20, that is also pivoted to the receiver at the place 14. At the small end of the receiver is a transverse tubular portion 21, having a trunnion bearing on tubular members 22 and 23, whereby the receiver is supported to oscillate. The latter trunnion members project toward each other from the upper portion of a U-shaped support 24. The portion 25 of this support is tubular, connecting with the tubular trunnion member 23, and thereby communicating with a tubular portion 26 of the cross-piece 21 of the receiver. The chamber 27, does not open directly into the receiver, but is closed except to an inlet-pipe 28, leading into the receiver therefrom and terminating near its upper portion, as shown in Fig. 7. The lower end of the tubular support 22 connects with a valve member 29, to which leads a steam-supply pipe 30. The valve-seat 31 controls the port admitting the steam into the device through the tubular support 25. The stem 32 of this valve also carries a valve member 33, that controls the admission of atmospheric air through a pipe 34. When the trap is in the upper position, the steam admission is closed and the air admission is open, as indicated in Fig. 7.

This permits the escape of the air in the trap when the water is flowing into it; but when the trap fills and is lowered the valve 33 will close the air admission and open the steam admission. By this means the water is forced out of the receiver through its proper outlet.

The trunnion member 22 is constantly open to the chamber of the receiver and has at its outer end a T member 35, attached thereto, to which are connected the supply-pipe and the outlet-pipe for the receiver, as best shown in Figs. 5 and 8. In these two pipes are placed suitable valves, and mechanism connects these valves with the receiver, whereby when the receiver is in the elevated position for the admission of water of condensation the supply-pipe valve will be opened and the outlet-pipe valve closed; but upon the receiver filling and assuming its lower position for discharge the valve in the outlet-pipe will be opened and the valve in the inlet-pipe closed. The outlet-pipe is usually connected with a steam-boiler, and therefore is open to full boiler-pressure; but at this stage the receiver is open to full boiler-pressure through the valve member 29 and pipe 28, leading into the receiver. In the construction shown a supply-pipe 36 is connected with the T 35 and provided with a valve member 37, in the form shown being a balanced valve. An outlet-pipe 38 extends from the T 36 and is shown as provided with a balanced valve 39. A lever 40 is pivoted on a post 41, that may extend upward from the T 35, and this lever is connected with the stems 42 and 43 of the valves 37 and 39, respectively. By this means when one valve is in the open position the other valve will be closed, such two positions being indicated in Figs. 5 and 6, respectively. This lever 40 extends along the side of the receiver 12 and projects through a slot 44 in an arm 45, secured to the receiver. This slot is so arranged that when the receiver reaches the limit of its upper position the bottom wall of the slot will engage the lever 40 and move the lever to close the valve 39 in the outlet-pipe and at the same time open the valve 37 in the inlet-pipe, as shown in Fig. 5. This will permit admission of the water of condensation through the valve 37 and through the T 36 and trunnion-pipe 32, as indicated by the arrows in Fig. 5; but when the receiver becomes filled and is lowered by the weight of the water the upper wall of the slot in the arm 45 will strike the lever 40 at the limit of the lowering movement, and thereby shift the lever to close the valve 37 in the supply-pipe and open the valve 39 in the outlet-pipe. At this position of the receiver the live-steam supply has been admitted into the receiver through the pipe 28 at the same time that the water through the outlet-pipe 38 and

valve 39. By this arrangement the water will be practically balanced, and therefore can flow out of the receiver by gravity through the outlet-pipe 38 and the valve 39, as indicated by the arrows in Fig. 6.

From this arrangement it follows that when the receiver is in the filling position no water can escape into the outlet-pipe and to the boiler-pipe. The valve 39 is closed, therefore, and all of the water of condensation must pass into the receiver, and since the receiver is overbalanced by a certain weight of water, and therefore a certain determined quantity of water, the meter will register the exact amount of water of condensation that passes through the apparatus. When the receiver is lowered by the weight of the water, the supply will be securely closed by the valve 37 and no water of condensation can pass either into the receiver or can escape through the outlet-pipe into the boiler. It will be further seen that the controlling-valves in the supply and outlet pipes being operated by the receiver will be of great advantage to prevent any escape of live steam from back pressure through the outlet-pipe by reason of the valve 39.

Having thus described my invention, I claim—

1. In a steam-trap device, the combination of a receiving vessel supported to move up and down, means for causing it to be lowered when containing a certain amount of water and to be elevated upon discharge of such water, a supply-pipe for the water into the receiver, and an outlet-pipe for the receiver, a valve placed in the supply-pipe, a valve placed in the outlet-pipe, a means connecting said valves and the receiver whereby the supply-pipe will be opened and the outlet-pipe closed when the receiver is in the upper position and the feed-pipe will be closed and the outlet-pipe opened when the receiver is in the lower position.

2. In a steam-trap device, the combination of a receiving vessel supported to move up and down, means for causing it to be lowered when containing a certain amount of water and to be elevated upon discharge of such water, a supply-pipe for the water into the receiver, and an outlet-pipe for the receiver, a valve placed in the supply-pipe, a valve placed in the outlet-pipe, a means connecting said valves and the receiver whereby the supply-pipe will be opened and the outlet-pipe closed when the receiver is in the upper position and the feed-pipe will be closed and the outlet-pipe opened when the receiver is in the lower position, a register, and means connecting the receiver and register for indicating the number of reciprocations of the receiver.

3. In a steam-trap device, the combination of a receiving vessel supported to rise and fall and organized to lower when contain-

ing a certain amount of water, and to be elevated upon discharge of such water, a supply-pipe for the water leading into the receiver, and an outlet-pipe for the receiver, a valve in the supply-pipe, a valve in the outlet-pipe, and a lever connecting said valves to alternately open and close the valves, and means for rocking said lever by the movement of the receiver, whereby the supply-pipe will be opened and the outlet-pipe closed when the receiver is in the upper position and the feed-pipe will be closed and the outlet-pipe opened when the receiver is in the lower position.

4. In a steam-trap device, the combination of a receiving vessel supported to rise and fall and organized to be lowered when containing a certain amount of water and to be elevated upon discharge of such water, a feed-pipe for the water leading into a receiver, a supply-pipe leading into the feed-pipe, an outlet-pipe leading from the feed-pipe, a valve in the supply-pipe, a valve in the outlet-pipe, a lever connecting said valves to alternately open and close the valves, and means for rocking said lever by the movement of the receiver, whereby the supply-pipe will be opened and the outlet-pipe closed when the receiver is in the upper position, and the feed-pipe will be closed and the outlet-pipe opened when the receiver is in the lower position.

5. In a steam-trap device, the combination of a receiving vessel supported to rise and fall and organized to be lowered when containing a certain amount of water and to be elevated upon discharge of such water, a feed-pipe for the water leading into a receiver, a supply-pipe leading into the feed-pipe, an outlet-pipe leading from the feed-pipe, a valve in the supply-pipe, a valve in the outlet-pipe, a lever connecting said valves to alternately open and close the valves, means for rocking said lever by the movement of the receiver, whereby the supply-pipe will be opened and the outlet-pipe closed when the receiver is in the upper position, and the feed-pipe will be closed and the outlet-pipe opened when the receiver is in the lower position, a register, and means connecting the receiver and register for indicating the number of reciprocations of the receiver.

6. In a steam-trap, the combination of a receiver mounted to oscillate, a feed-pipe connected with the receiver in its several positions, the receiver being organized to be depressed upon receiving a certain amount of

water, and to be elevated when such water is discharged, a supply-pipe connected with the receiver, an outlet-pipe connected with the receiver, a valve in the supply-pipe, a valve in the outlet-pipe, means connecting the valves and the receiver whereby when the receiver reaches its lower discharging position it will open the outlet-pipe valve and close the supply-pipe valve, and when the receiver reaches the limit of its upper position it will close the outlet-valve and open the supply-valve.

7. In a steam-trap, the combination of a receiver mounted to oscillate, a feed-pipe connected with the receiver in its several positions, the receiver being organized to be depressed upon receiving a certain amount of water, and to be elevated when such water is discharged, a feed-pipe, a supply-pipe connected with the feed-pipe, an outlet-pipe connected with the feed-pipe, a valve in the supply-pipe, a valve in the outlet-pipe, a lever connected with said valves to alternately open and close the valves upon being rocked, and a stop device connecting the receiver and lever whereby when the receiver reaches the limit of its lower discharging position it will open the outlet-pipe valve and close the supply-pipe valve, and when the lever reaches the limit of its upper position it will close the outlet-valve and open the supply-valve.

8. In a steam-trap, the combination of a receiver mounted to oscillate, a feed-pipe connected with the receiver in its several positions, the receiver being organized to be depressed upon receiving a certain amount of water, and to be elevated when such water is discharged, a supply-pipe connected with the receiver, an outlet-pipe connected with the receiver, a valve in the supply-pipe, a valve in the outlet-pipe, means connecting the valves and the receiver whereby when the receiver reaches its lower discharging position it will open the outlet-pipe valve and close the supply-pipe valve, and when the receiver reaches the limit of its upper position it will close the outlet-valve and open the supply-valve, a register, and means connecting the receiver and register for indicating the number of reciprocations of the receiver.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 16th day of July, 1906.

WILLIAM H. ODELL.

Witnesses:

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JOHN O. SEIFERT.