

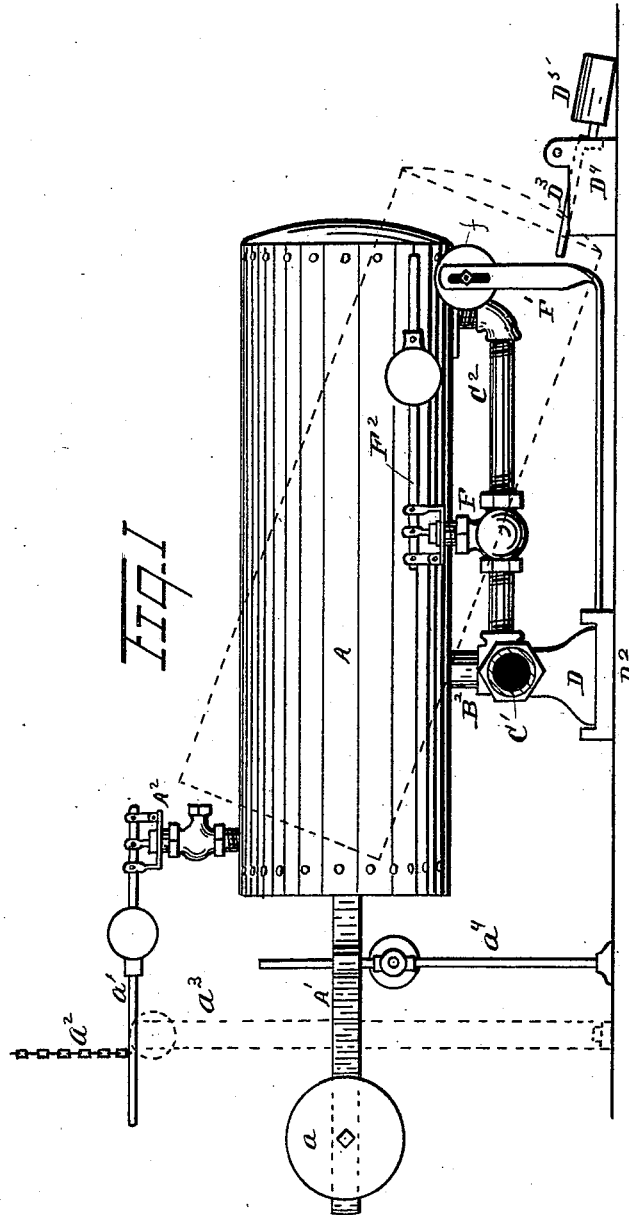
(No Model.)

3 Sheets—Sheet 1.

J. MOREHEAD.
STEAM TRAP.

No. 420,822.

Patented Feb. 4, 1890.



Witnesses

John Schuman
Charles F. Salow

Inventor

John Morehead
By his Attorney
Newell S. Wright.

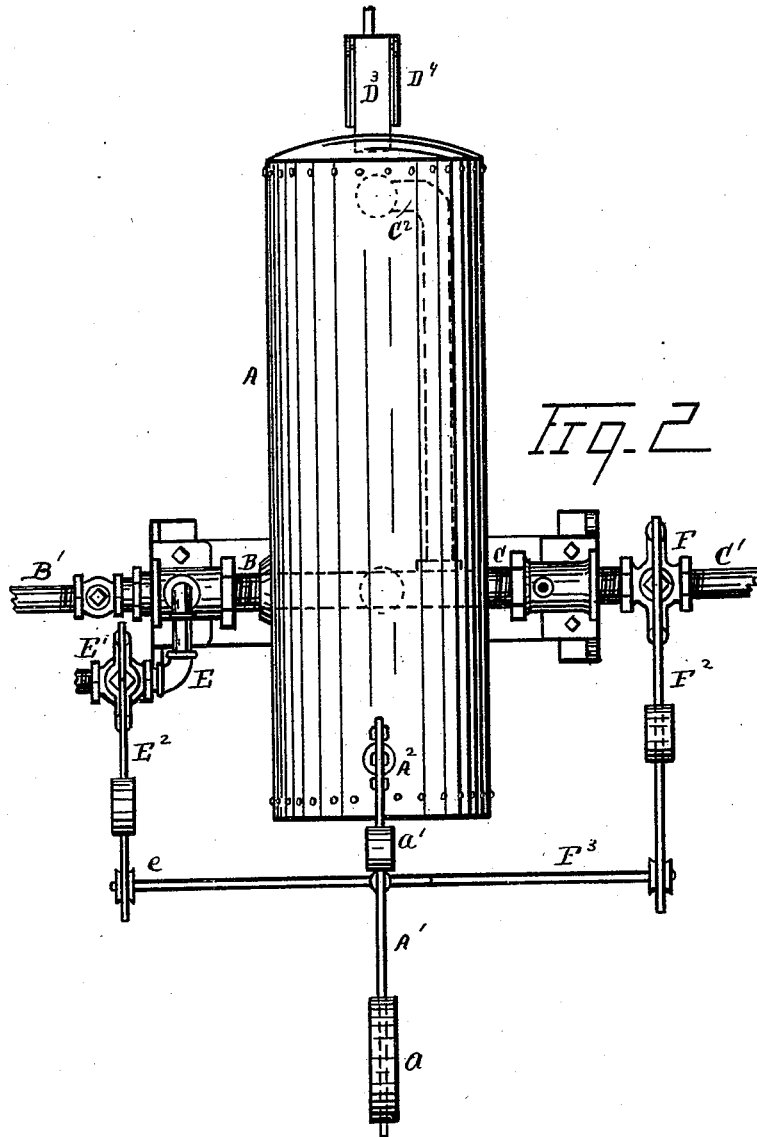
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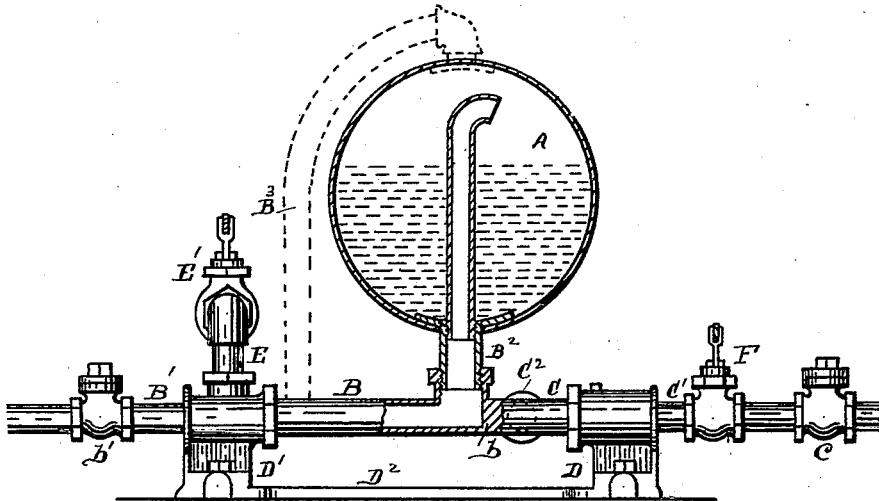


Fig. 3

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UNITED STATES PATENT OFFICE.

JOHN MOREHEAD, OF DETROIT, MICHIGAN.

STEAM-TRAP.

SPECIFICATION forming part of Letters Patent No. 420,822, dated February 4, 1890.

Application filed September 10, 1889. Serial No. 323,557. (No model.)

To all whom it may concern:

Be it known that I, JOHN MOREHEAD, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Steam-Traps; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain new and useful improvements in steam-traps to relieve steam-pipes of condensed water, and is designed more especially as an improvement on a steam-trap for which United States Letters Patent have heretofore been granted to me, to wit: No. 263,716, issued September 5, 1882; No. 282,353, issued July 31, 1883, and No. 327,891, issued October 6, 1885. The aim of my present invention is to simplify and cheapen the construction and to still more perfect its operation and utility.

To these ends my invention consists of the devices and appliances, their combinations and arrangements, as more fully hereinafter described and claimed, and more clearly shown in the accompanying drawings, in which—

Figure 1 is a side elevation illustrating my invention. Fig. 2 is a plan view, and Fig. 3 is a vertical cross-section on the line of the pipes B C.

I carry out my invention as follows: A represents the receiving-chamber of the trap. Instead of constructing said chamber of a casting, as heretofore, I now contemplate its manufacture of boiler-iron, thereby diminishing the weight. As heretofore, I contemplate the suspension of said chamber at one side the center of gravity, the chamber having an arm A' and adjustable weight *a* to regulate the tilting of said chamber and keep it in proper position to receive the condensed water until its weight counterbalances the weighted arm and causes the chamber to tilt and discharge the water therefrom.

B denotes an inlet-pipe, and C a discharge-pipe having an oscillatory connection with a

steam-pipe B' and an outlet-pipe C' in any suitable manner.

D D' represent supports, in which the steam-pipe and the outlet-pipe are properly mounted to permit the tilting of the receiving-chamber.

It will be understood that the pipes B and C may have a slip-joint connection with the pipes B' C'. The pipes B C may be formed of a single piece of piping having a blank or wall *b* to close the communication from the one to the other.

The chamber A is mounted upon an upright pipe B², supported upon the pipe B C and communicating with the pipe B and the interior of the chamber A. To insure the admission of steam upon the surface of the condensed water in the chamber, I carry upward the pipe B², as shown, and give a turn to its upper end to throw the steam and water downward.

At the end opposite the pipe B² an exit-pipe C² leads from the interior of the chamber and communicates with the pipe C for the discharge of the condensed water. In the present case the pipe C² is secured to the chamber beneath it instead of being formed integral therewith, thus permitting its removal for the purpose of cleaning it of sediment or for the purpose of repairing it or replacing it with a new one. It has also the additional advantage that it can be furnished at a reduced cost and does not render the whole casting worthless or necessitate its being patched in case of a flaw in the pipe portion of the casting.

A² is a relief-valve, which I arrange so as to insure its being closed when the weight of water tilts the chamber A in order to confine all the pressure within said chamber to effect the more perfect relief of the said chamber from the condensed water therein. To this end the valve may be provided with a weighted arm *a'*. A wire or cable *a*² suspended from the ceiling may be engaged with said arm, which will hold the valve open when the chamber is filling, and which will yield when the chamber tilts to allow the valve to close; or instead of a cable or wire *a*² engaged with said arm a standard *a*³ may be

located beneath the arm and engaged therewith to serve the same purpose.

The arm A' may be provided with a foot a^1 to limit the tilting of the chamber at the end adjacent thereto.

D³ is a yielding plate for the rear of the chamber to dump on. This plate is journaled on a base D⁴, and is provided also with a weighted arm D⁵, which aids in returning the chamber to normal position. This base is secured at the rear of the chamber at a level with the supporting-bed D², from which rise the supports D D'. The chamber in dumping is limited in its movement by said plate.

It is found desirable in practice to have a dumping-plate or analogous device to limit the fall of the receiving-chamber, so that the valves will operate to best advantage. By making such plate yielding and providing the weight this device is made to serve an additional purpose in assisting the return of the chamber to its normal condition. This plate being provided renders the setting up of the trap much easier, as no experimenting is required to ascertain how much the chamber should fall with relation to the valves, as the whole question is determined by placing the plate on a level with the part D².

When the condensed water is to be returned to the boiler, I provide a steam-pipe E leading from the steam-space of the boiler and communicating with the inlet-pipe B or with the interior of the chamber above the water in any suitable manner. In the steam-pipe E, I locate a valve E', arranged to be opened by the tilting of the chamber, and vice versa, so as to equalize the pressure in the chamber when the valve is opened, or rather to overcome the pressure therein and so restore the condensed water to the boiler. It will be understood that the trap in this case is located above the water-line of the boiler.

Any suitable device may be employed for opening the valve E' as the chamber tilts. To this end the valve may be provided with a weighted arm E², and a tripping-roller e be located beneath the arm and engaged, so as to be lifted with the tilting of the chamber and raise the arm of the valve to open it.

When the condensed water is to be returned or emptied into a tank or sewer a valve F may be located either in the exit-pipe C² or outlet-pipe C', the only difference being in the manner of opening the valve as the chamber tilts. If located in the pipe C², I engage upon the bed D² a tripping-arm F'. The valve F is provided with a weighted arm F² engaged, preferably, with a roller f on the arm F'. In this event as the chamber tilts downward the valve itself will rock downward therewith. The arm F² being thus engaged with the arm F' the valve will be opened. If the valve is located in the pipe C' the valve will not rock, but by carrying the arm F² in the opposite direction, and leading a tripping-bar F³ from the arm A

under the arm F² it will be clear that as the chamber tilts the valve will be opened. The pipes B and C' may be provided with check-valves b' and c .

Instead of leading the condensed water into the chamber through the support B², a separate pipe B³, Fig. 3, may be employed instead.

By means of the plate D³, upon which the chamber dumps, the opening of the steam-valve E' is regulated.

If a pipe B³ be employed, it may be located outside the chamber A, in which case the support B² is solid.

It will be understood that when the trap is applied to return the water to the boiler the valve F is dispensed with, and when it is used to discharge the water to a tank or sewer the pipe E' may be dispensed with. It will also be understood that the weights upon the valves F and E' hold them in closed position against pressure until the chamber tilts.

The check-valves may be omitted when the trap is employed to return the water to a tank or sewer.

What I claim as my invention is—

1. In a steam-trap, the combination, with a tilting chamber, an inlet-pipe communicating therewith, an outlet-pipe having its passage separated from the passage of the inlet-pipe, a pipe C², arranged beneath the chamber and having one end engaged therewith, and its other end engaged with the outlet-pipe, substantially as set forth.

2. In a steam-trap, the combination, with a tilting receiving-chamber, of a plate pivoted in proximity thereto and provided with a weight, substantially as set forth.

3. In a steam-trap, the combination, with a tilting receiving-chamber, of an inlet-pipe communicating therewith, an outlet-pipe, a valve to control the communication through said outlet-pipe, and a pivoted weighted plate located beneath the lower end of the tilted chamber to regulate the opening of said valve, substantially as set forth.

4. In a steam-trap, the combination of a tilting receiving-chamber rigidly mounted on rocking pipes B and C, an inlet-pipe communicating with the interior of the chamber, and an exit-pipe leading from the lower end of the tilted chamber and communicating with the pipe C, the pipes B and C provided with a solid wall to close communication between them, substantially as set forth.

5. The combination, in a steam-trap, of a tilting chamber rigidly mounted on rocking pipes B C and supported thereupon by a pipe B², a steam-pipe communicating with the interior of said chamber, an exit-pipe leading from the lower end of the tilted chamber and communicating with the pipe C, said pipes B C cut off from communication the one with the other, substantially as set forth.

6. In a steam-trap, the combination of a tilting receiving-chamber mounted upon pipes

B C, an inlet and an exit pipe communicating with said chamber at opposite sides of the center of gravity of said chamber, and a relief-valve arranged to close when the weight of water tilts the chamber, and to open when the chamber returns to its normal position, substantially as set forth.

7. In a steam-trap, the combination, with a tilting receiving-chamber supported at one side the center of gravity upon a pipe B³, engaging with rocking pipes B C, a steam-pipe B' communicating with the interior of the chamber through the pipe B³, and an exit-pipe C² communicating with the pipe C, substantially as set forth.

8. In a steam-trap, the combination, with a tilting receiving-chamber supported at one

side the center of gravity upon a pipe B³ and pipes B C, a steam-pipe B', axially connected with the pipe B, a discharge-pipe C', axially connected with the pipe C, a steam-pipe E, communicating with the pipes B B³, an exit-pipe communicating with the said discharge-pipe, and a valve in the steam-pipe E, said pipe B³ provided with a pipe extending above the water in said chamber, substantially as set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN MOREHEAD.

Witnesses:

N. S. WRIGHT,
JOHN MILLER.