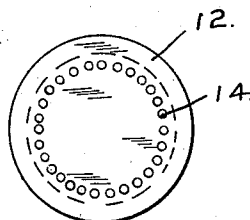
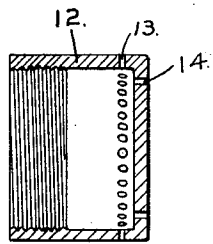
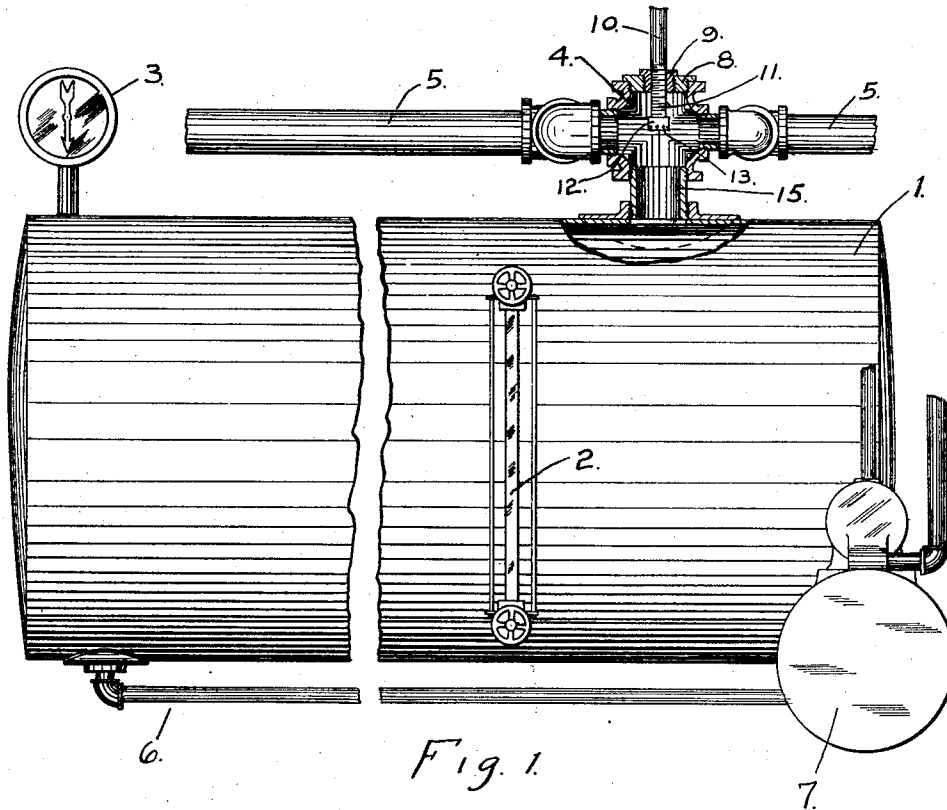


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CONDENSER FOR STEAM HEATING SYSTEMS.  
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1,115,501.

Patented Nov. 3, 1914.



Witnesses  
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# UNITED STATES PATENT OFFICE.

TIMOTHY P. CANFIELD, OF COLUMBUS, OHIO.

CONDENSER FOR STEAM-HEATING SYSTEMS.

1,115,501.

Specification of Letters Patent.

Patented Nov. 3, 1914.

Application filed February 10, 1912. Serial No. 676,750.

*To all whom it may concern:*

Be it known that I, TIMOTHY P. CANFIELD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Condensers for Steam-Heating Systems, of which the following is a specification.

My invention relates to condensers for steam heating systems and is particularly directed to the improvement of that type of systems having a complete circulation and embodying a continuous receiver such as are commonly used for heating houses and the like. It resides primarily in an attachment to this continuous receiver which coöperates in conjunction with the steam return pipes in a manner to effectually condense the steam return substantially at its point of entrance to the said receiving chamber. The device is particularly applicable to steam heating systems utilized in glass houses, although not limited thereto, and the improvement produced thereby resides in the insurance of complete condensation of the steam at about its moment of entry into the receiving chamber, which results in greatly lowering the pressure within such chamber and facilitating the admission of the said return steam to the said receiving chamber. An appreciable drawback hitherto, has been the effect had by the steam within the receiving chamber in retarding the admission of the returned steam. This has resulted because of the lack of complete condensation of the steam before its entry into the steam receiving chamber.

My invention therefore contemplates the provision of means for joining the return pipes at their point of admission to the receiving chamber and maintaining a cold water spray within this means of joining, serving to effectually condense the steam at or about the moment of its admission to the steam receiving chamber.

The preferred embodiment of my invention is shown in the accompanying drawings, in which similar characters of reference designate corresponding parts, and in which—

Figure 1 is a side elevation of my receiving tank and adjacent appurtenances, Fig. 2 is a detail in section of the spraying cap utilized in connection with my improved spraying attachment, and, Fig. 3 is a plan view of the structure shown in Fig. 2.

In the drawings, the receiving tank is shown at 1 and such receiving tank carries a water gage 2, a steam gage 3 and a four-way pipe connection 4 serving as a means of communication between return pipes 5 and the receiving tank 1. The receiving tank is further provided with a branch pipe 6 which connects with a boiler feed pump 7 whereby the water of condensation within the receiving tank, may be drawn therefrom and pumped into the boiler.

Carried by the four-way pipe connection 4 by means of threaded collars 8 and 9 or in any other preferred manner, is a pipe 10 externally threaded as at 11 for adjustably fitting within the collar 9 and having a nozzle cap 12 thereon provided with a series of radial outlet ports 13 and concentric axial ports 14.

The steam from the system is returned through the pipes 5 to the pipe connection 4 and upon reaching the same is almost immediately subjected to a spray of cold water emitted from the ports 13 and 14 of the nozzle 12, this spray of cold water being of course thrown in a manner to completely fill the tubular formation 15 through which the return steam necessarily passes. Inevitably, the steam is thoroughly condensed by this spray of cold water and being converted into water readily passes into the receiving chamber. Inasmuch as the spraying action is continually in action, no steam enters the receiving tank for the reason that all of the returned steam must first pass through the spray of cold water and is thoroughly condensed thereby.

It will be seen that I have provided a simple attachment for receiving tanks of complete circulation steam heating systems which insures the complete transformation of returned steam to water at a determinate point in the system and thereby decreases the pressure in the tank by forming a partial vacuum, which further tends to draw the returned steam into the receiving chamber.

It will be seen that I have provided a gravity return system for steam heating plants, wherein the required pressure for forcing the returned steam into the receiving chamber is comparatively small. It is well understood that a system of this type, requires a considerable pressure for maintaining a circulation and even this considerable pressure is frequently very poorly ef-

fective for the reason that the steam which enters the receiving chamber or tank is frequently very little condensed and offers considerable resistance to the further entrance of steam and to a consequent perfect circulation. With my apparatus, it becomes a practical impossibility for steam to enter the receiving chamber in its original form, since the spraying device at the point of admission practically insures condensation. It will be also understood that I am enabled to effectually utilize the exhaust steam from the pumps in my system.

What I claim, is—

1. In condensers for steam heating systems, the combination with a receiving tank for the water of condensation and condensing water, of a four-way pipe fitting located in proximity to and above said tank and having one of its openings in direct communication therewith, opposing steam return pipes leading into diametrically opposite openings of the fitting and a single cold water spray pipe passing through the opening of the fitting diametrically opposite the tank connection, said spray pipe having lateral and longitudinal exit openings.

2. In condensers for steam heating systems, the combination with a receiving tank for the water of condensation and condensing water, a four-way pipe fitting located in proximity to and above said tank with one of its openings in direct communication therewith, return steam pipes connected with lateral diametrically opposite openings in said fitting, and a spray pipe adjustably

mounted in the opening in said fitting diametrically opposite the tank connection, said spray pipe having radial and axial perforations whereby the condensing water will be discharged into both of the meeting streams of steam and directed through the tank connection into the tank and said spray pipe may be adjusted toward and from the tank connection.

3. In condensers for steam heating systems, the combination with a tank for receiving the water of condensation and condensing water, of a pipe fitting located in proximity to said tank and above the same, one of the openings of said fitting being in direct communication with the tank, a single cold water spray pipe leading into the fitting at a point diametrically opposite the tank connection, whereby the condensing water will be projected in a direction to discharge the contents of the fitting into the tank, and return steam pipes connected with said fitting at diametrically opposite points and having direct free and unobstructed passages leading to the center of the fitting and spray discharged from the spray pipe, whereby the fitting will operate as a condensing ejector for increasing the vacuum in either or all of the return steam pipes.

In testimony whereof I affix my signature in presence of two witnesses.

TIMOTHY P. CANFIELD.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."