

No. 843,088.

PATENTED FEB. 5, 1907.

H. J. LANGE.
HEATER.

APPLICATION FILED SEPT. 17, 1906.

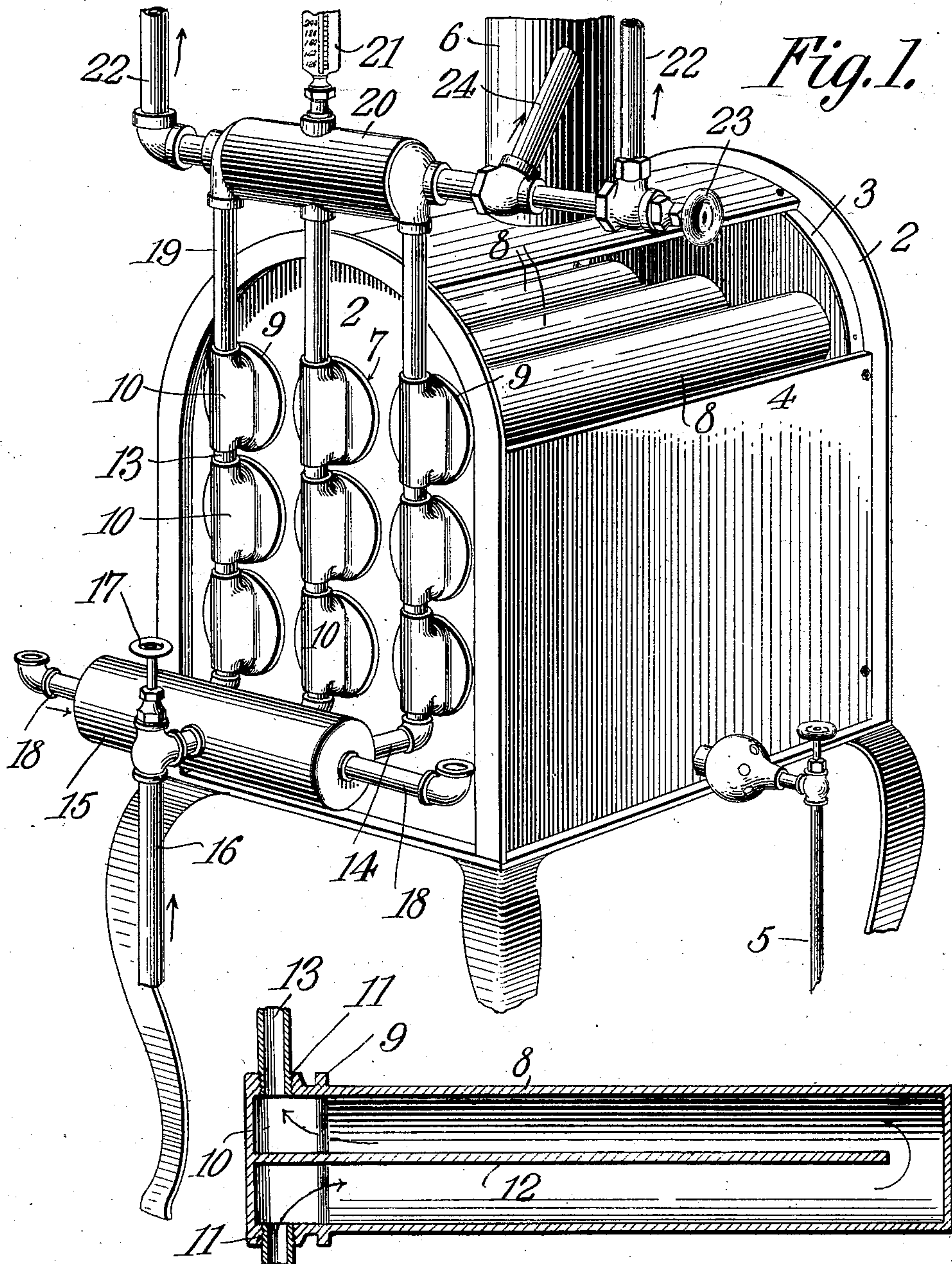


Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY J. LANGE, OF LORAIN, OHIO.

HEATER.

No. 843,088.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed September 17, 1906. Serial No. 334,901.

To all whom it may concern:

Be it known that I, HENRY J. LANGE, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented a new and useful Heater, of which the following is a specification.

This invention relates to hot-water heaters; and its object is to provide a device of this character for use in hot-water heating systems whereby a large quantity of hot water may be quickly heated and directed through a series of radiators.

A still further object is to provide a heater from which water may be withdrawn for domestic purposes without materially interfering with the circulation of water for heating purposes.

Another object is to provide a compact heater of attractive appearance which is especially adapted for use with gas-burners, although the same may be designed for use with any form of fuel.

With the above and other objects in view the invention consists of certain novel features of construction and combinations of parts, which will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings, Figure 1 is a perspective view of the heater, a portion of the casing being removed; and Fig. 2 is an enlarged vertical longitudinal section through one of the tubes.

Referring to the figures by characters of reference, 1 is a casing, preferably formed of sheet metal and consisting of heads 2, having inwardly-extending flanges 3, on which are secured metal sheets 4, which serve to close the space between the heads. A burner (not shown) is adapted to be located in the lower part of the casing, and gas may be supplied thereto through a pipe 5. Obviously instead of providing the gas-burner any desired form of fire-box may be utilized, so as to permit other forms of fuel to be employed. An outlet-pipe 6 is arranged in the top of the casing to permit the escape of products of combustion. Parallel series of openings 7 are formed in one head 2 of the casing, and extending through each of these openings is a large tube 8, such as shown in section in Fig. 2, said tube being closed at both ends and having an annular flange 9 adjacent one end, which serves to limit its movement into the casing by abutting against the apertured

head. Upon the front end of each tube 8 is formed a hollow vertical extension 10, opening into the tube and having ports 11 in opposite ends thereof, and extending transversely of the tube and between these ports is a partition 12, which terminates short of the opposite end of the tube, so as to form two parallel passages communicating at the end of the tube farthest removed from the ports 11. The vertically-alining tubes are connected by coupling-pipes 13, which are threaded into the ports, and the lower ports 11 of the lower tubes 8 are connected by pipes 14 with a drum 15, extending transversely of the casing and having a water-supply pipe 16 opening thereinto. A valve 17 is employed for controlling the admission of water to the drum, and return-pipes 18 open into the ends of the drum. Extending upward from the upper tube 8 are pipes 19, which open into a drum 20, arranged horizontally adjacent one end of the casing, and a gage 21 is preferably carried by this drum to indicate the pressure within the tubes. Pipes 22 extend from the ends of the drum for conveying water to a suitable number of radiators, (not shown,) so that it may be used for heating purposes, and it is to be understood that the water is to be returned to the heater by way of the pipes 18. Valves 23 may be located at suitable points in either or both of the pipes 22 for the purpose of controlling the circulation therethrough. Another pipe 24 extends from one of the pipes 22 for conveying water to a point where it may be used for domestic purposes.

It is thought that the operation of this heater will be thoroughly understood from the foregoing description, when read in connection with the accompanying drawings. By burning fuel within the lower portion of the casing the tubes thereabove will be heated, and therefore the water contained within them will be correspondingly heated. A circulation will therefore be established from the drum 15 through the pipes 14 and into the lower portions of the lower tubes 8. The water will then circulate from end to end in each of these pipes and pass through the outlet-ports 11 into the next adjoining tubes, where the circulation will be continued and this action of the water will be carried out until after it has passed through all of the pipes, whereupon it will flow outward through the pipes 19 into the drum 20 and thence through the pipes 22 to the radiators and

back to drum 15 through pipes 18. As the partition 12 is of the same width as the internal diameter of the tube in which it is located, it is absolutely impossible for fluid, either in the form of water or steam, to pass around the partition except at the end thereof, which is spaced from the end of the tube. Any water desired for domestic purposes can be drawn from the pipe 24, and water admitted to pipe 16 will keep the tubes and pipes filled at all times. It will be seen that this heater is very simple, compact, and efficient and is particularly adapted for heating and domestic purposes in residences. Importance is attached to the particular arrangement of the tubes and the manner of connecting them, because it will be noticed that all joints are disposed outside of the casing and there is no danger of leakage occurring as a result of flames or hot gases coming into contact with the joints. It will also be noted that elbows and other like connections are absolutely dispensed with between the tubes, and the water is permitted to flow directly from one to the other, and practically no resistance is therefore offered to its circulation.

The preferred form of the invention has been set forth in the foregoing description, but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of the claims.

What is claimed is—

1. In a heater the combination with a casing; of a plurality of series of tubes within the casing and projecting from one end thereof, tubular connections between the

tubes of each series, means within each tube for directing water longitudinally therein while passing therethrough, a drum connected to one end of each series of tubes, a drum connected to the other end of each series of tubes, outlet-pipes extending from one of the drums, return-pipes connected to the other drum, and a supply-pipe opening into one of said drums.

2. In a heater the combination with a casing; of a series of tubes formed with closed ends disposed within the casing and with open ends projecting beyond the casing, a hollow extension upon each of the projecting ends, said extension having oppositely-disposed inlet and outlet ports, tubular connections between the ports of the several extensions, and a partition within each extension and projecting longitudinally within each tube, said partition terminating short of the closed end of the tube and being of the same width as the internal diameter of the tube.

3. In a heater the combination with a casing; of a series of tubes formed with closed ends disposed within the casing and with their opposite ends projected beyond the casing, a hollow reduced extension upon each of the projecting ends, said extensions having alining oppositely-disposed inlet and outlet ports, tubular connections between the ports, and means within the extensions and tubes for directing fluid from each inlet-port longitudinally of the tube and back to the outlet-port.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

HENRY J. LANGE.

Witnesses:

B. R. MADDOCK,
EVA M. GRAY.