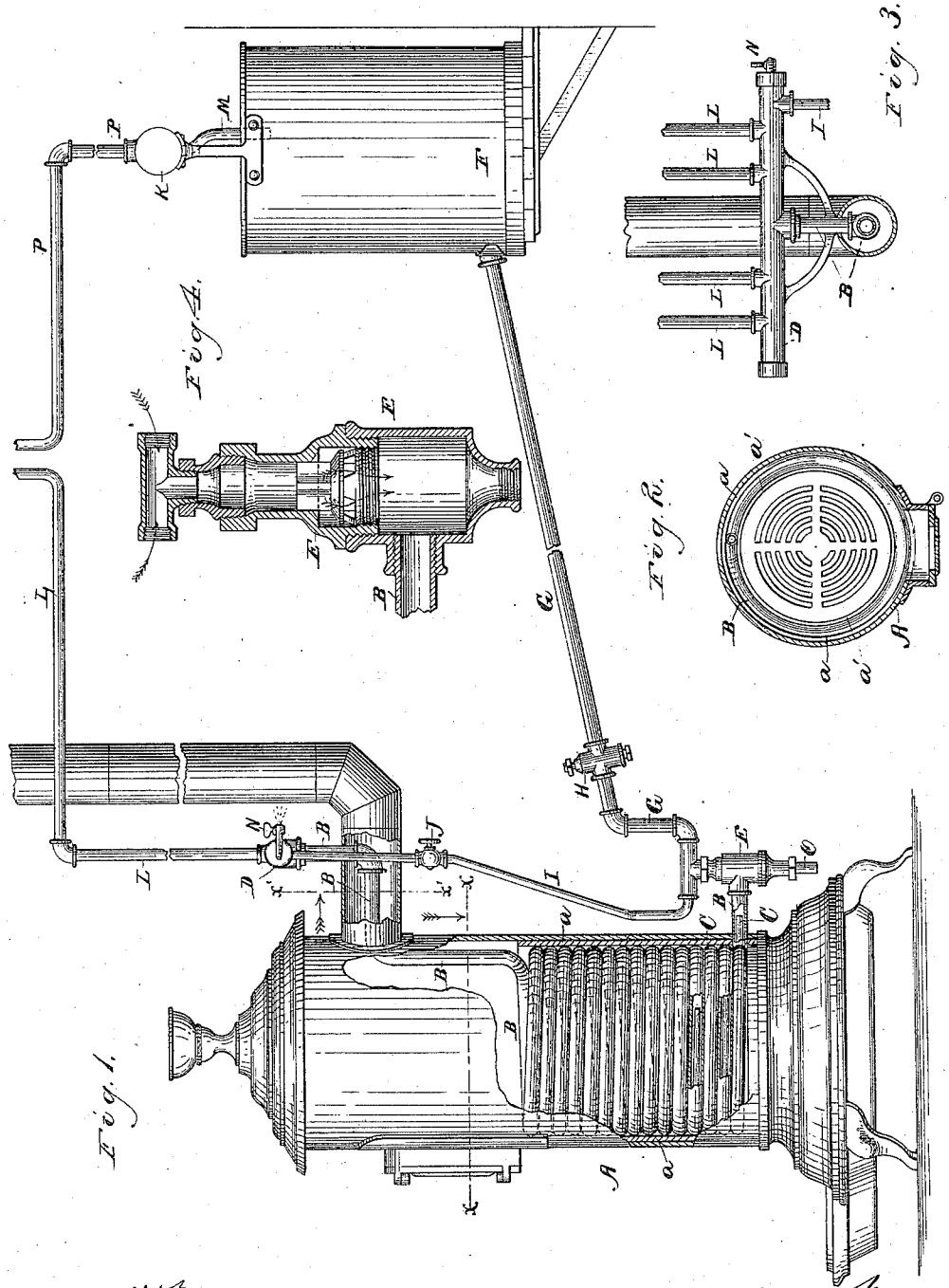
(No Model.)

P. H. INMAN.

STEAM HEATING APPARATUS.

No. 309,625. Patented Dec. 23, 1884.



Witnesses.

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UNITED STATES PATENT OFFICE.

PETER H. INMAN, OF HIGHLAND PARK, ILLINOIS, ASSIGNOR OF ONE-HALF TO CHARLES B. SOULE, OF SAME PLACE.

STEAM-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 309,625, dated December 23, 1884.

Application filed May 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, PETER H. INMAN, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Steam-Heating Apparatus, of which the following, in connection with the accompanying drawings, is a specification.

In the drawings, Figure 1 is a side elevation of a steam-heating apparatus embodying my improvements. Fig. 2 is a section in the plane of the line *x x* of Fig. 1, viewed in the direction indicated by the arrow there shown. Fig. 3 is a section in the plane of the line *x' x'*, viewed in the direction indicated by the arrow there shown; and Fig. 4 is a vertical central section through the lower check-valve.

Like letters of reference indicate like parts.

A represents an ordinary cylinder heating-stove.

B is a coil of pipe of comparatively large diameter, located within the stove in the place usually occupied by fire-bricks; but fire-bricks may also be employed if their use be deemed best; but I regard it as preferable to employ a cast-iron cylinder in the place of fire-bricks, so as to expose the coil more directly to the incandescent fuel, and yet protect it somewhat from the fire; and I also deem it best to place a sheet-iron cylinder around the outside of the coil, as shown at *a* and *a'*, respectively.

C is a smaller coil, arranged within the lower part of the coil B. The coil C is of such diameter as not entirely to fill that part of the coil B in which it is arranged, and is open at both ends.

D is a horizontal pipe located outside of the stove, and entered by the upper end of the pipe B.

E is a check-valve, entered by the lower end of the pipe B. The valve E may be made in any well-known or suitable way adapting it to prevent the steam from forcing the hot water in the pipe B back through the said valve, and permitting it to open automatically when the steam-pressure is comparatively low or weak, or at its minimum.

F is an open water-tank, and G is a pipe passing from the said tank into the upper end of the valve E.

H is a stop-cock located in the pipe G, and between the valve E and the tank F.

I is a drip and equalizer pipe, entering the pipe D and the upper end of the valve E.

J is a shut-off in the pipe I.

K is a condenser, and L L are pipes passing from the pipe D to the radiator-coils located in the different rooms, respectively.

M is a drip-pipe passing from the condenser into the upper or open end of the tank F.

N is a safety-valve, and O is a tap or drip at the lower end of the valve E. A drip-pipe, P, passes down from the coil in each room, respectively, into the condenser.

The operation is as follows: I fill or nearly fill the tank F with water, and set the cock H so that the water will pass through the pipe G and valve E into the coils B and C about as fast as it will be generated into steam in the said coils. If, however, the steam should be generated too fast, the body of water in the coils B and C will be automatically diminished, for the reason that the steam-pressure will then be sufficient to close the valve E, and so temporarily shut off the supply of water to the said coils. By the time the steam reaches or nearly reaches its minimum pressure, the valve E will be opened by the pressure of water upon it, which will then be greater than the steam-pressure, and more water will thus be supplied to the coils, which water will quickly be converted into steam, owing to the exposure of the water to the heat, in the manner shown and described. In this manner the water will be alternately supplied and shut off automatically, as occasion requires.

It is to be understood that the fire should be so regulated and the tank F of such elevation that the water will be generated into steam before leaving the coiled portion of the pipe B, and that if any water should be carried to the pipe D it will be drained therefrom into the pipe I, and thence into the valve E and coils B and C, when the pressure on top of the valve E exceeds the pressure below it; but any pressure exerted above the said valve through the pipe I may be prevented by closing the cock J. The steam thus generated will pass to the radiator-coils for heating the rooms, and the drip or condensation in those coils may be allowed to pass down through the

pipes P P into the condenser K, and thence into the tank F. The valve N prevents danger from too great steam-pressure. The coils B and C may be drained or emptied by opening the drip or tap O. The open small coil C holds a portion of the water away from as direct heating by the fuel as the water in coil B is exposed to, and thus modifies to some extent the temperature of the water in the pipe B, and tends to prevent too sudden or rapid evaporation. The water in the pipe C, however, eventually passes into the pipe B, becomes steam, and the smaller pipe is again filled, as well as the pipe B.

This apparatus may also be used as a water-heater by permitting the water to enter the coils faster than it can be generated into steam, and the water so heated may be conducted away from the heater for use.

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

1. The combination, substantially as specified, in a steam-heating apparatus, of the coil B, located in the heater and in communication with the steam-distributing pipes and heat-radiators, the water-supply pipe G, the stop-cock H, located in the pipe G, and the automatic valve E, also located in the pipe G and communicating with the pipe B, and arranged between the latter pipe and the cock H, for the purposes specified.

2. The combination, substantially as described, in a steam-heating apparatus, of the coil B, located in the heater and in communication with the steam-distributing pipes and the heat-radiators, the water-supply pipe G, the stop-cock H, located in the pipe G, the automatic valve E, also located in the pipe G and in communication with the pipe B, and arranged between the latter pipe and the cock H, and the drip-pipe I, entering the steam-distributing pipe, and also entering the valve E, and having therein a shut-off or cock, J, for the purposes set forth.

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

PETER H. INMAN.

Witnesses:

D. M. ERSKINE, Jr.,

CHAS. B. SOULE.