

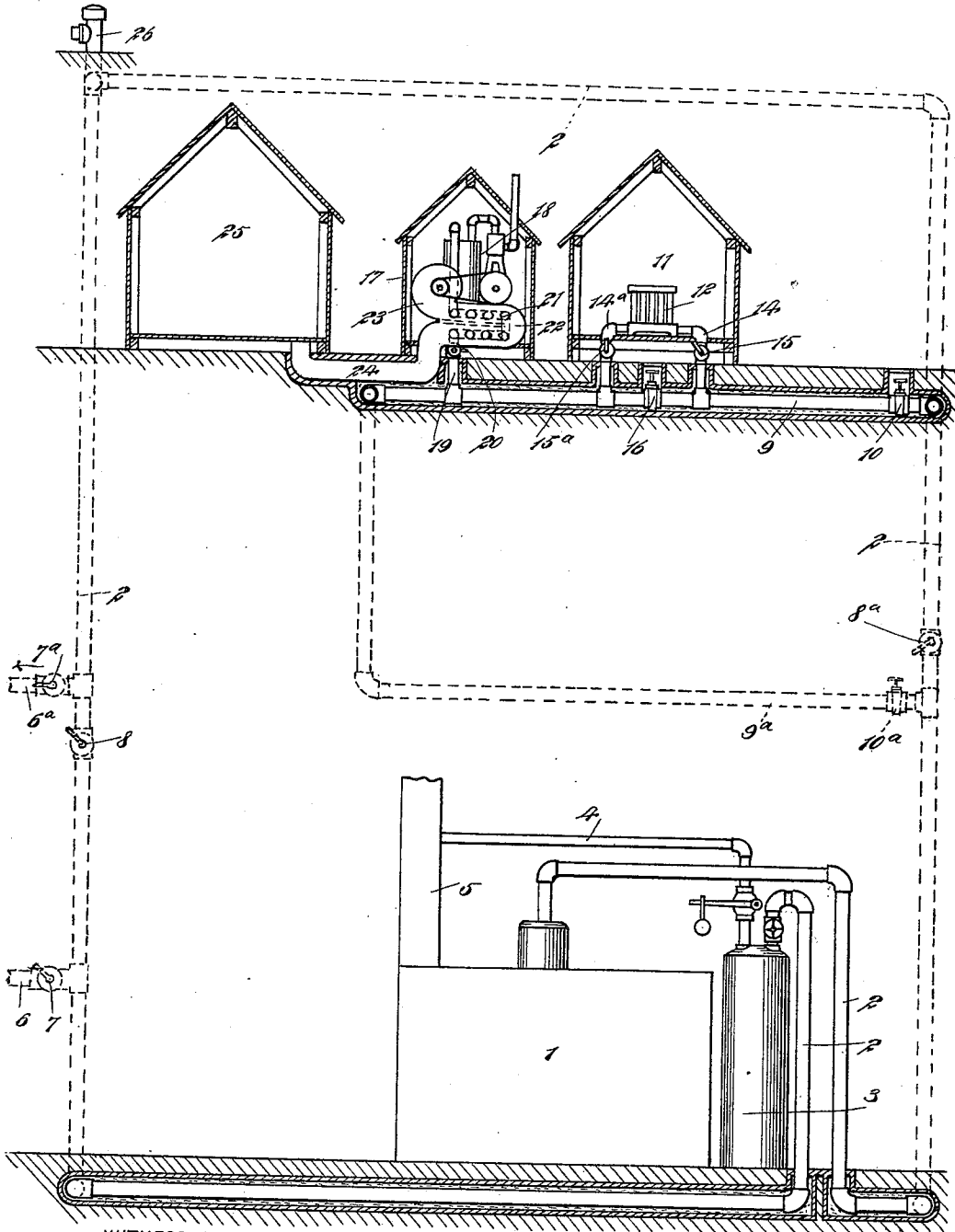
No. 643,535.

Patented Feb. 13, 1900.

J. D. ROBERTSON.
STEAM HEATING PLANT.

(Application filed Apr. 12, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES D. ROBERTSON, OF LA SALLE, ILLINOIS.

STEAM-HEATING PLANT.

SPECIFICATION forming part of Letters Patent No. 643,535, dated February 13, 1900.

Application filed April 12, 1899. Serial No. 712,742. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. ROBERTSON, of La Salle, in the county of La Salle and State of Illinois, have invented a new and Improved
5 Steam-Heating Plant, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide a superior steam-heating plant by means of which towns and cities may be supplied with
10 steam primarily for heating purposes, the plant being also arranged so that the steam may be employed for motive purposes.

This specification is the disclosure of one form of my invention, while the claim defines
15 the actual scope thereof.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure represents a diagrammatic view of the plant.

20 The steam is generated in a boiler 1, from the dome of which passes the main pipe 2, which leads from the boiler throughout the system and returns to the receiver 3, in which the water of condensation is contained. The
25 steam from the receiver may be utilized for any desired purpose—such, for example, as that of working the boiler-feed apparatus. The receiver 3 is provided with a blow-off
30 pipe 4, leading into the stack 5 of the boiler-furnace. By means of this arrangement the proper circulation of the steam in the main pipe 2 is insured and the steam may be utilized most effectively.

The various heating apparatuses throughout the system are fed by branch or service
35 pipes communicating with the main pipe by means of T's, as shown at the left of the drawing, where the branch or service pipes 6 and 6^a are shown in connection with the main pipe
40 2 and provided with valves 7 and 7^a, commanding the pipes 6 and 6^a. These pipes 6 and 6^a pass to the heating apparatus. The pipe 6^a receives the feed of the heating apparatus and the pipe 6 serves as the return. For
45 each heating apparatus therefore there are two pipes, such as the pipes 6 and 6^a. Between each of these pairs of pipes 6 and 6^a is arranged in the main pipe a valve 8, which valve controls the passage of steam through
50 the main pipe. Now by means of these valves 7 and 8 it is possible to so regulate the passage of steam that the highest possible effi-

ciency is attained. As shown in the drawing, the steam, acting in the direction of the arrow, passes first into the pipe 6^a and produces the
55 most advantageous operation. The valve 7^a should be fully opened, while the valve 8, between the pipes 6 and 6^a, should be partly open, thus permitting the steam to pass through the main pipe 2, as well as through
60 the pipe 6^a. The steam returning by the pipe 6 passes the valve 7, which should be partly opened, thus retarding the passage of the steam, and consequently causing it to act more effectively on the heating apparatus. 65

At the right of the drawings I have shown two service-pipes 9 and 9^a, respectively commanded by valves 10 and 10^a and situated one on either side of the valve 8^a in the service-pipe. These pipes 9 and 9^a lead to various
70 appliances for utilizing the steam, which are indicated in the drawing. Thus in the building 11 a heat-radiator 12 is arranged, which is commanded by a feed-pipe 14^a and a return-pipe 14. The pipes 14 and 14^a are respectively commanded by valves 15 and 15^a,
75 and the service-pipe 9 has a valve 16 intermediate the pipes 14 and 14^a. Now the steam passing into the pipe 9 will enter the radiator 12 by the pipe 14^a, past the valve 15^a, which
80 should be opened to its fullest extent, and the steam will return by the pipe 14 past the valve 15, which should be partly opened. The valve 16 should, as the valves 8 and 8^a, be but partly opened. I have also shown an arrangement for utilizing the steam to operate
85 a hot-air heater and for the purposes of securing motive power. In a building 17 is arranged an engine 18, fed from the service-pipe 9 by a branch 19, which is commanded
90 by a valve 20 and which leads to a number of coils 21, situated in a hot-air box 22, through which the air is forced by a fan 23, driven by the engine 18. From the hot-air box 22 a conduit 24 leads to a building 25, which is to be
95 heated by hot air. The steam in the coils 21 will heat the box 22, and the air forced through the box will be heated thereby and the building will be heated. Should it not be desired to heat the building, the engine 18
100 may be driven without utilizing the coils 21, and cold air may thus be forced into the building for the purposes of ventilation. It is also possible to provide the main pipe 2

with plugs, such as the plugs 26, which may be utilized for various municipal purposes—such, for example, as that of driving fire-engines and pumps. The system thus arranged is extremely economical and effective, and by its means the greatest possible efficiency may be attained from a modest expenditure.

Various changes in the form, proportions, and minor details of my invention may be resorted to without departing from the spirit and scope of my invention. Hence I consider myself entitled to all such variations as may lie within the scope of my claims.

The water of condensation derived from the steam throughout the system may be contained in any suitable receptacle—the receiver 3 or any suitable tank or system arranged adjacent to the boiler. The live steam returned to the receiver 3 from the pipes of the system may be used for any purpose desired in the vicinity of the boiler—for example, running an engine adjacent to the boiler. By means of the blow-off at the receiver 3 a continual circulation throughout the system is insured. Supposing that the steam from the receiver 3 were drawn off to drive an engine adjacent to the receiver, when this engine is in operation the circulation through

the receiver will not be interfered with, and consequently the blow-off will not be necessary; but should the engine be stopped then the blow-off should be used to keep up the circulation in the remainder of the system. It is essential that this circulation be perfect, else the effectiveness of the system will be impaired, and by providing the arrangement shown I insure the circulation, and thus produce an effective plant. The water of condensation accumulating in the receiver 3 may be withdrawn by any desired means. Such means being commonplace have not been shown.

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

A steam plant having a generator, a main leading from the generator throughout the system and returning to a point near the generator, a receiver situated near the boiler and having the main returned thereto, and a valved blow-off pipe passing from the receiver, for the purpose specified.

JAMES D. ROBERTSON.

Witnesses:

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