

(No Model.)

2 Sheets—Sheet 1.

W. P. SKIFFINGTON.
SYSTEM OF STEAM HEATING.

No. 464,946.

Patented Dec. 8, 1891.

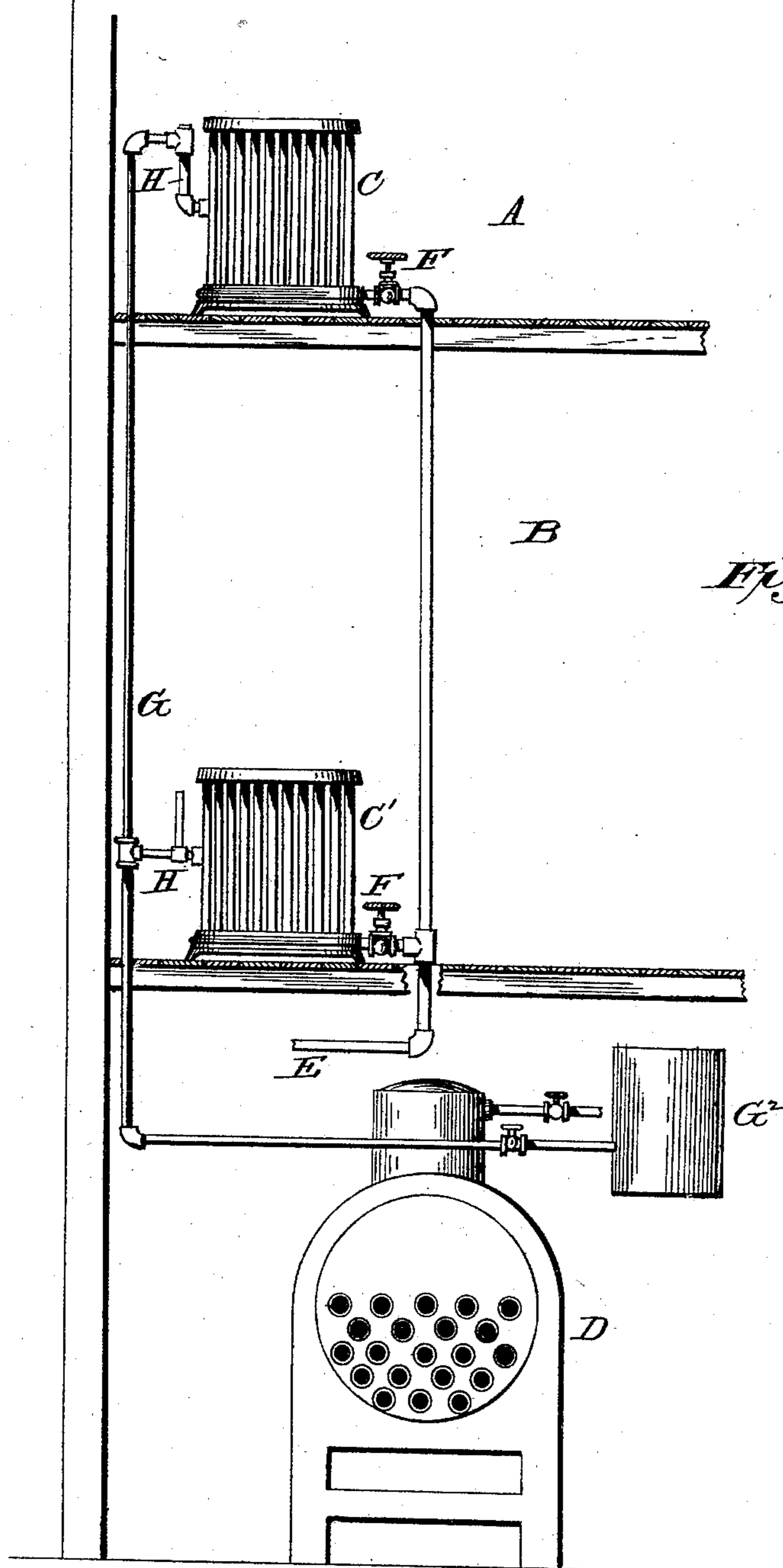


Fig. 1.

WITNESSES
I. L. Ourand
Alex Mohor

INVENTOR
W. P. Skiffington
E. J. Mansbach
Attorney

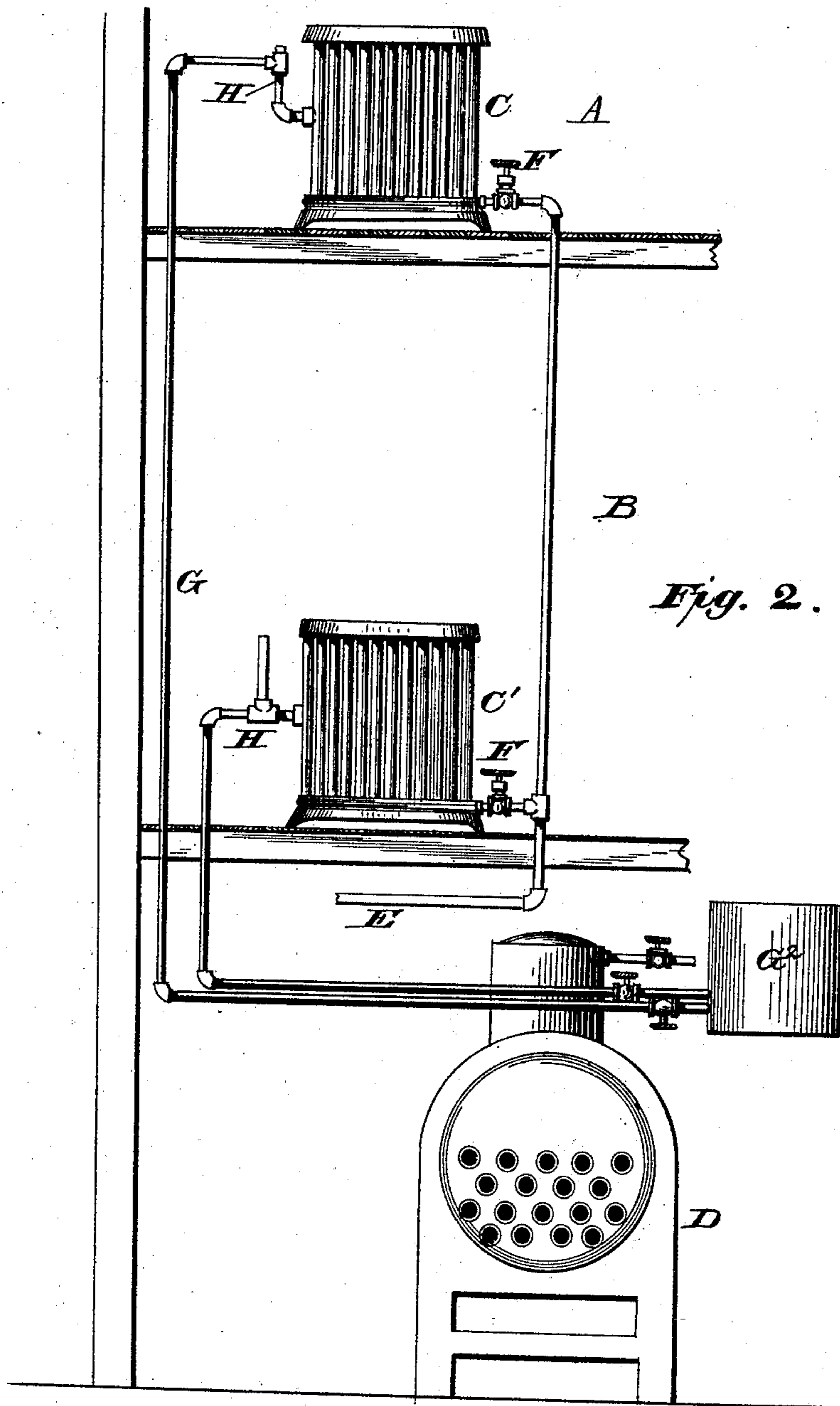
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WITNESSES

F. L. Ourand
Alex. Mahon

INVENTOR

W. P. Skiffington
By *L. M. Gussabough*
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM P. SKIFFINGTON, OF NEW YORK, N. Y.

SYSTEM OF STEAM-HEATING.

SPECIFICATION forming part of Letters Patent No. 464,946, dated December 8, 1891.

Application filed April 25, 1890. Serial No. 349,433. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. SKIFFINGTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in a System of Steam-Heating; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to means for creating, maintaining, and controlling free and perfect circulation, in a heating system, of the heating-fluid; and it consists, broadly, in the combination, with a heating system, of an air-pipe additional to the supply and return pipes, and an exhaustor for drawing air from the system through the said air-pipe.

My invention further consists in the combination, with a heating system, of an air-pipe and an exhaustor for drawing air from the system through said air-pipe and an automatic valve located at some suitable place in the said air-pipe for restricting or controlling the flow of air through the said pipe.

My invention further consists in certain novel features of construction and arrangements of parts, all as hereinafter set forth.

In the accompanying drawings, Figure 1 is a sectional elevation of a building, showing radiators for heating the several rooms thereof, in which a single-pipe heating system is employed, and showing the additional air-pipe communicating at one end with the radiators and provided at the other end with an exhausting apparatus for drawing air through the air-pipe. Fig. 2 is a similar view showing another arrangement of my invention, wherein each radiator is provided with a separate air-pipe leading to the exhausting apparatus, whereby each radiator can be controlled independently of the other.

In the drawings my improvement is shown as applied to what is commonly called a "single-pipe heating system," in which one and the same pipe serves as the supply-pipe to supply steam and also as the return-pipe to permit the escape or return of the water of condensation. My improvement, however,

can be equally well applied to what is commonly called a "double-pipe heating system," in which there is a supply-pipe for supplying the steam to the heaters or radiators and a separate return-pipe for permitting the escape or return of the water of condensation. As these two systems of heating are well known, I have shown in the drawings connected herewith only one system—to wit, the single-pipe system.

In the drawings, A and B represent apartments to be heated, and C C' represent heaters or radiators of any suitable construction located in said apartments, respectively.

A boiler D, of any approved form or construction, is shown located in the cellar or any other convenient point, from which passes a pipe E, which extends to and communicates with the several radiators, the inlet of each radiator being controlled by any suitable form of valve, as shown at F, the parts already shown thus constituting a single-pipe heating system, in which the heating agent is supplied to the radiators and the water of condensation returned therefrom to the boiler through the same pipe E.

G is an air-pipe, which communicates with a series of radiators, as shown in Fig. 1, or with a single radiator, as shown in Fig. 2, and which extends therefrom to the boiler-room or other suitable place in the building, where it is connected with a suitable exhaustor, by means of which a vacuum or a partial vacuum may be obtained in said air-pipe.

In the best and most complete form of my invention the air-pipe G is connected with the radiator or heating apparatus at a place above that part of the radiator where the water of condensation ordinarily collects, and the said air-pipe is provided with an automatic air-valve H, which acts to open for the passage of the air, but to close so as to prevent the passage of the heating agent, this operation being effected by the effect of heat and cold, respectively, upon the said valve. As a result of this construction the water of condensation does not get into the air-pipe, but escapes through the pipe E, or in a double heating system escapes through the return-pipe of that system. The automatic valve opens when the heating apparatus is cold, as

it is when the apparatus is first started or when any considerable quantity of air collects in the heater, and thus permits the exhausting or withdrawal from the heater of such air both when the heating system is first put into operation and at any time while it is in operation and when for some reason air has collected in the heater.

G² is an exhaustor or exhausting apparatus connected with the air-pipe G in such a way as to enable air to be exhausted from or drawn out of the heating apparatus through the said air-pipe. This exhausting apparatus may be made in any suitable form. For example, it may be an exhaustor connected with the boiler, or it may be a pump or any other device which shall be found most convenient or which the nature of the case may require, and it may be connected with any part of the air-pipe.

The advantages of my invention may however be utilized to some extent by connecting the air-pipe to any part of the heating apparatus, provided that if the air-pipe is connected with the return-pipe it is so connected above the point where the water of condensation collects that escapes down through the said return-pipe; and the advantages of my invention may also be secured to some extent by an air-pipe in which no valve is employed, or in which some other form of valve is used in place of the automatic valve, or any other suitable means for controlling the passage of air through the air-pipe.

Where each radiator or heater is connected with the exhaustor by a separate air-pipe, each air-pipe may be provided with a suitable stop-cock or valve near the exhaustor, whereby the engineer or attendant may control the heat of each independently of the other; or where a single air-pipe is used for a series of heaters a valve may be placed upon such air-pipe near the exhaustor, whereby the entire system may be controlled in like manner.

The operation of the system is as follows: When it is desired to supply the heating agent, the valves in the supply-pipe are turned on and the valve or valves on the air pipe or pipes near the exhaustor are opened, the exhaustor being in operation, as a result of which the air is drawn from the radiators or heaters, thereby removing the resistance to the heating agent otherwise caused and permitting a free and complete circulation of the heating agent and preventing air from being suddenly compressed by the action of the heating agent and then expanding against the same to force the same backward and thereby preventing the usual hammering heretofore so objectionable.

Having now described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. In combination with a heating system, an air-pipe, in addition to the supply and return pipes, connecting in said system, and an exhaustor for drawing air from the system through the said air-pipe, substantially as described.

2. In combination with a heating system, an air-pipe connecting in said system, an exhaustor for drawing air from the system through the said air-pipe, and means for controlling or restricting the flow of the air through the said air-pipe, substantially as described.

3. In combination with a heating system, an air-pipe, in addition to the supply and return pipes, connecting in said system, and an exhaustor for drawing air from the system through the said air-pipe, and a valve located in the system for controlling the escape of the air through said air-pipe, substantially as described.

4. In combination with a heating system, an air-pipe connecting in said system, and an exhaustor for drawing air from said system through the said air-pipe, and an automatic valve controlling the said air-pipe, substantially as and for the purpose set forth.

5. In combination with a heating system, an air-pipe, in addition to the supply and return pipes, connecting in said system, and an exhaustor for drawing air from the system through said air-pipe, and an automatic valve located in said air-pipe, substantially as set forth.

6. In combination with a heating system, an air-pipe, in addition to the supply and return pipes, connecting with a radiator above the part of the radiator where the water of condensation ordinarily collects, and an exhaustor for drawing the air from the system through the said air-pipe, and an automatic valve located in the said air-pipe, substantially as set forth.

7. In combination with a heating system consisting of radiators and connecting supply and return pipes, a suitable source of heat, an air-pipe in addition to the supply and return pipes, having branches connecting it with each radiator, an automatic air-valve connected with each of the branches of said air-pipe, and an exhaustor for drawing air from the system through said air-pipe, substantially as set forth.

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

WILLIAM P. SKIFFINGTON.

Witnesses:

I. L. MILLER,

ALFRED R. LEACH.