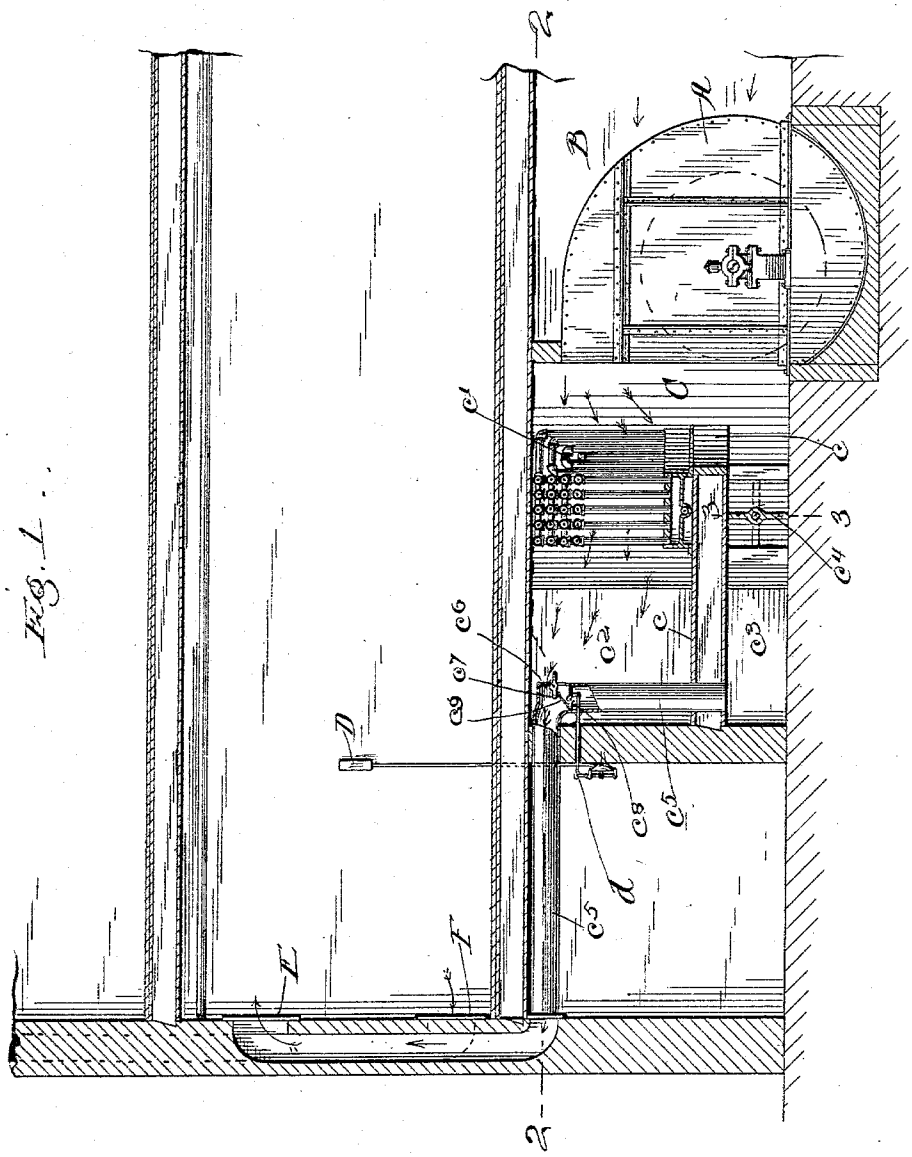
(No Model.) 2 Sheets—Sheet 1.

C. P. NOBLE.

HEATING AND VENTILATING SYSTEM.

No. 563,677. Patented July 7, 1896.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

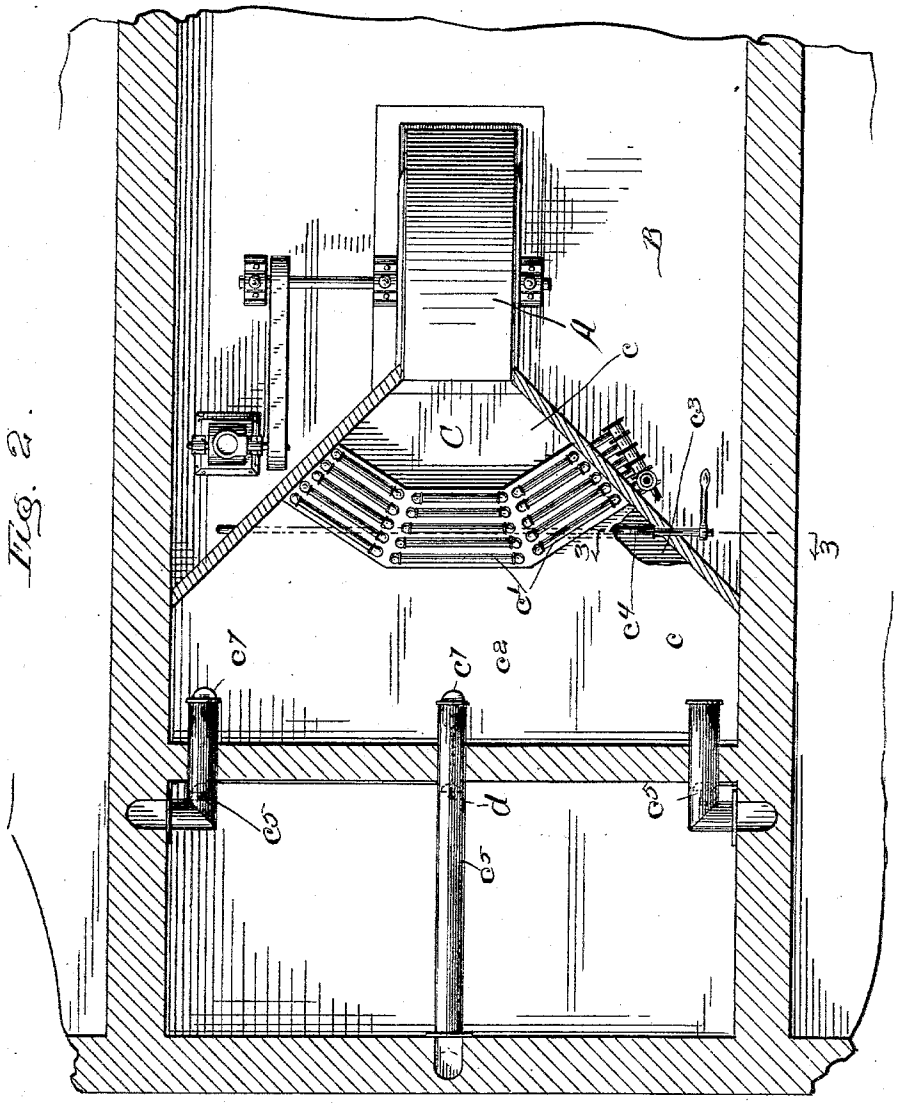
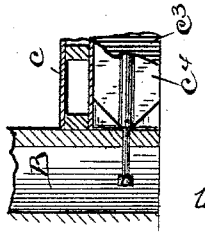


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HEATING AND VENTILATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 563,677, dated July 7, 1896.

Application filed March 13, 1895. Serial No. 541,544. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. NOBLE, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heating and Ventilating Systems, of which the following is a specification.

My invention relates to certain improvements in heating and ventilating systems, the purpose of which is to facilitate the rapid heating of a number of rooms, and to maintain a given temperature in said rooms when once heated.

The class of heating systems to which my invention is applied is that in which a number of rooms or inclosures are heated and ventilated by means of a supply of hot air and an independent supply of cooler air, each provided with means for admitting the air therefrom to the different rooms, and each of said rooms being provided with a thermostat provided with suitable connections for admitting more or less of either hot or the cool air to regulate the temperature of the room. In the use of these systems it is frequently necessary to heat all of the rooms after they have become cold and before it is desirable to occupy the same, as, for instance, school-rooms, offices, or, in fact, the rooms of any building in which it is not important that the heat should be carefully regulated except at certain portions of the day or night. With these systems, as ordinarily constructed, much time and fuel are wasted, for the reason that the rooms do not heat evenly, and after one room becomes hot the system keeps up an active ventilation and constant changing of the air in the same while the other rooms are heating.

It is the purpose of my invention to provide means whereby the entire heat and power of the ventilating system may be directed solely to heating a series of rooms up to a given temperature without any waste of air or power during the time required by this operation. To such end the invention consists in certain novel features claimed at the end of this specification and fully described below.

My invention is illustrated in the drawings by means of three figures, of which—

Figure 1 is a vertical cross-section of a portion of a building, showing parts of a heating system adapted to illustrate my improvements. Fig. 2 is a horizontal cross-section in line 2 2 of Fig. 1, and Fig. 3 is a broken vertical section in line 3 3 of Fig. 2.

The system here shown consists of a fan A, suitably driven and located in an apartment B, supplied with fresh air; an apartment C, into which the blast of the fan is received, said apartment containing a horizontal partition c, upon which rests a series of heating-coils c' wholly without novelty, beyond which is a hot-air chamber c^2, and beneath which is a chamber for cooler air c^3, which is provided with a balanced damper c^4, by means of which the chamber c^3 can be entirely cut off from the blast of the fan, and a series of pipes c^5, leading from the chamber c^3 upward through the chamber c^2, and thence to the apartments to be heated. Making the partition c hollow is merely a convenient way of making it more nearly non-conducting. In the portion of these pipes within the chamber c^2 are openings c^6, provided with valves c^7, and other valves c^8 are placed in the pipes c^5 between the openings c^6 and the chamber c^3. These valves are shown as connected by means of links c^9, so that the opening of one closes the other. Each room is provided with a thermostat D, of any approved description, provided with suitable connections d with the valves c^7 c^8, to operate the valves and regulate the temperature by admitting either hot or cool air, as may be necessary. The pipes c^5 open into the rooms near the top through registers E, and vents F are provided near the floor for the escape of the foul air.

In the ordinary operation of heating and ventilating the rooms the damper c^4 is wide open, as shown in dotted lines, and the air from the fan A passes either through the heating-coils c' or through the chamber c^3, just as may be determined by the position of the valves c^7 c^8. When the temperature of any one room rises a little above the desired point, the thermostat in that room operates the valves in the pipe leading thereto and admits more of the cooler air and less of the hot air. On the other hand, when the room becomes too cold the action is reversed, so that the system is entirely automatic and satisfactory after all the rooms are once heated

to the proper temperature. In heating the rooms in the first instance, however, as soon as one room becomes hot, which always happens before all of the rooms are raised to the same temperature, the thermostat in that room shuts off the hot air and lets in the cool air, so that while the other rooms are heating this room is cooling down under the influence of the cooler blast through the chamber c^3. This involves a loss of heat and also takes up a portion of the blast from the ventilating-fan, both of which are undesirable for the reason that the rooms are not usually occupied at such a time, and a slight excess of heat, until all of the rooms become heated, is not objectionable. For this reason I have provided the damper c^4, by means of which the engineer may shut out entirely the cool-air chamber c^3 from the heating system until the entire building is heated up to the required point and until occupied. When this damper is closed, as shown in Fig. 1, the fan forces hot air through the chamber c^2 into all the rooms until one of them is sufficiently warm, when that room is at once cut off by its thermostat throwing the entire capacity of the heating system into the heating of the other rooms. The above operation is repeated on each room, one after the other, until the whole building is brought to required temperature.

I am thus able to heat a building in a much shorter time and with much less consumption of fuel and power. When the rooms come into use and ventilation is needed, the engineer throws the damper c^4 wide open and the system takes up the usual and normal function of both heating and ventilation.

I claim as new and desire to secure by Letters Patent—

1. The combination of several apartments to be heated, means for supplying a current of air, ducts for dividing and receiving the divided portions of said current, one of the ducts being provided with means for heating the air which flows through it, means for varying the relative volumes of the divided portions of said current in accordance with the changes of temperature in the apartments, means for uniting the divided portions of the current and delivering them to said apartments, and means for closing at will the ducts which are not heated.

2. The combination of several apartments to be heated, means for supplying a current of air, ducts for dividing and receiving the divided portions of said current, one of the ducts being provided with means for heating the air which flows through it, ducts leading to the apartments, respectively, and each receiving a part of the current in each of the ducts first mentioned, means for varying the relative volumes of the parts so received in accordance with the temperature in the apartment to which such parts are delivered, and means for closing at will the ducts which are not heated.

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