(No Model.) 2 Sheets—Sheet 1.

C. P. NOBLE.

HEATING AND VENTILATING SYSTEM.

No. 563,678. Patented July 7, 1896.

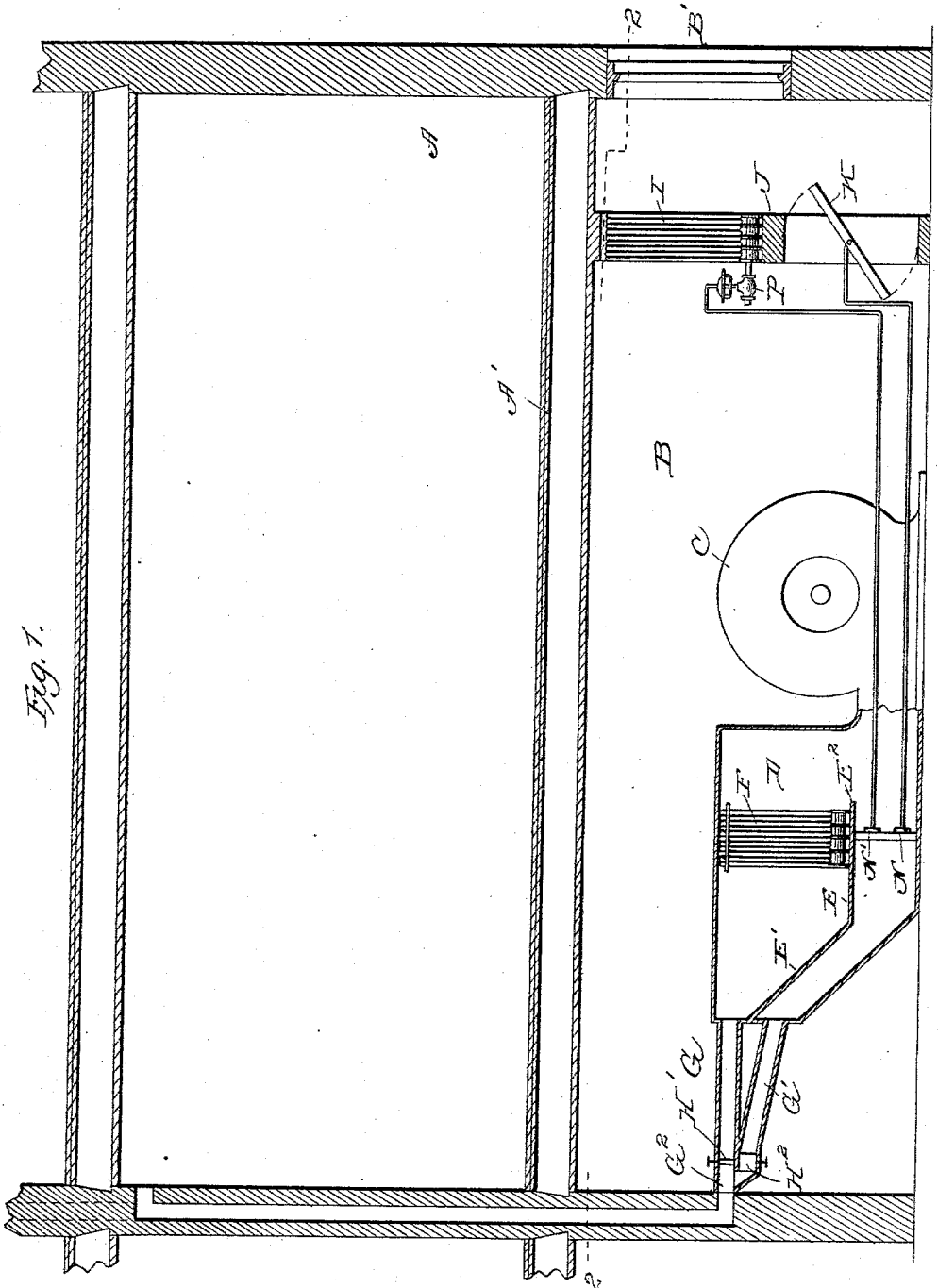

Fig. 1.

WITNESSES:

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L. D. Heinrichs.

INVENTOR

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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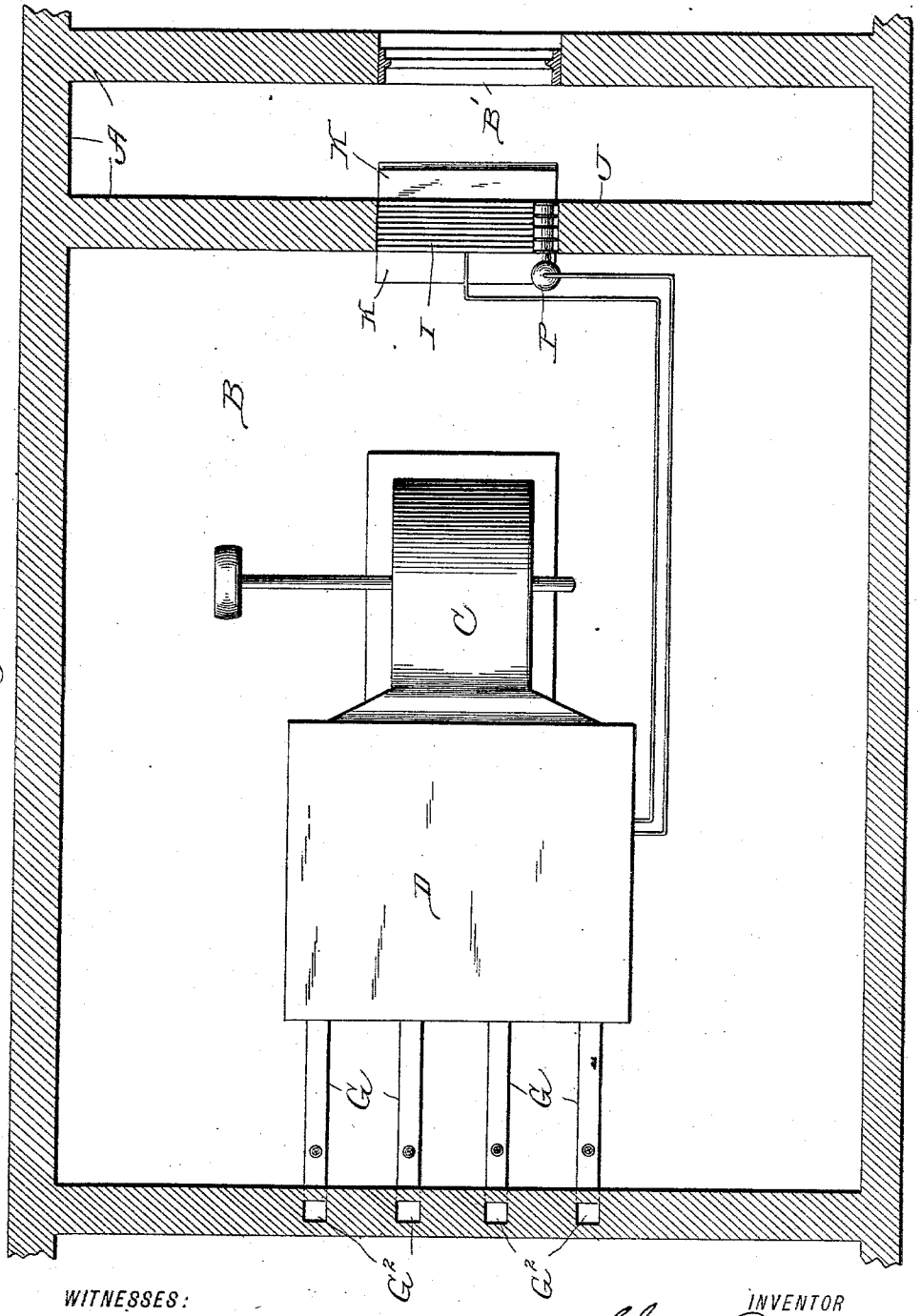

Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES P. NOBLE, OF CHICAGO, ILLINOIS.

HEATING AND VENTILATING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 563,678, dated July 7, 1896.

Application filed April 3, 1896. Serial No. 586,056. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. NOBLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heating and Ventilating Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide automatic devices by which the overheating of a room is prevented in systems where a warmer and a cooler current of air are used and ventilation remains constant.

In the accompanying drawings, Figure 1 is a diagrammatic vertical section of a portion of a building the rooms of which are to be heated and ventilated, my apparatus being shown in position. Fig. 2 is a sectional plan of the same, the line of section being 2 2, Fig. 1.

In the drawings, A A′ represents a building to be heated and ventilated, and B a room or compartment, preferably in the basement, to which external air passes through an opening B′. In this compartment is placed a fan C or its equivalent to be driven continuously from any suitable source of power. The fan is arranged to take air from the compartment and force it into a chamber D, preferably through an opening in the lower part of the chamber. A transverse partition E E′ divides that part of the chamber opposite the fan into open cells, and the partition's free margin E^2 is at some distance from the fan-opening and approximately on a level with the opening's upper side when the parts are arranged as shown. Upon this partition, and preferably near its free margin, rests a heater F without novelty.

From the chamber lead as many pairs of flues or pipes G G′ as may be required, the flues G all leading from the cell containing the heater and the flues G′ all leading from the other cell. The flues G G′ are provided, respectively, with cut-off valves H′ H^2, and beyond the valves they merge into a pipe G^2. The lower portion of that part of the chamber-wall opposite the fan-opening preferably inclines upward to in some measure direct the air that may pass to the flues G′.

The valves H′ H^2 are shown as adapted to be operated by hand, but they may be otherwise operated in well-known ways, the means for operating them not being material to this invention.

The air coming from without the building into the compartment through the opening B′ to supply the fan normally passes over a radiator I, set in an opening in a partition J, which completely divides the compartment. Alongside this radiator-opening is a second opening or by-pass controlled by a valve K. In the chamber D, below the plane of the partition, are placed two thermostats N N′ (one double-acting thermostat may be used) without novelty, connected, respectively, with the valve K and a cut-off P, controlling the radiator I. These connections may be of any suitable character, electric, pneumatic, or otherwise, but for illustration ordinary pneumatic devices have been selected. The thermostats N N′ are set to operate at different temperatures, for example, the first at 40° and the second at 50°.

Now in the operation of the device it is plain that with the by-pass valve K closed all the air entering the compartment B must pass over the radiator I. With the fan in operation the air delivered by it will pass through the flues G only, through the flues G′ only, or partly through both, according to the positions of the valves H′ H^2, or, in other words, the whole current delivered will be heated by the device F, none of it will be heated by that device, or part of it only will be heated by that device. Should the heat obtained by passing the whole current through the flue G be excessive, it may be reduced by passing part of the current through the flue G, and should further reduction be required the current may be caused to pass through the flue G′ only. Here the necessity for the present invention becomes apparent, for if the heat obtained while the current, tempered by the device I and passing through the flue G′ only, still be excessive, the temperature of this current should be automatically reduced. This might be accomplished by cutting out the device I, but under not unusual conditions such a step would cause the temperature of the air delivered to fall suddenly to a point inconsistent with proper uniformity in the temperature of the rooms

to be heated, and, further, if the temperature of the external air chanced to be far below 32° freezing would occur in the radiator, and the system would thus be seriously deranged. The apparatus set forth entirely eliminates the first difficulty by automatically opening the by-pass, instead of at once cutting out the radiator, when the heat of the current leaving the radiator is too great. It further avoids all possibility of such freezing in that it keeps the radiator in action whenever the temperature of the external air is below the freezing-point. That it does this will be evident if it be considered that practically cutting out occurs only when the heating device F is inoperative and after the by-pass has been opened—that is, when the only heat supplied to the rooms is that derived from passing a part only of the entering current over the radiator I. Obviously when the temperature of the open air is below 32° this cannot overheat a building unless there is an absurd disproportion between heating power needed and heating power provided.

What I claim is—

1. In a heating system, the combination with an air-channel divided for a part of its length, of mechanical devices for creating an air-current through said channel, a heater located in one division of said channel, two valves closing respectively the two divisions of the channel, a passage admitting air to said mechanical devices, a heating device in the path of air so admitted, a second passage also admitting air to said mechanical devices a valve closing said second passage, and two thermostats located in the path of air coming from both said passages and successively controlling the valve and heating device, respectively.

2. In a heating system, the combination with a chamber divided into two cells each having an exit-opening, of valves closing said openings respectively, a heater placed in one of said cells, a fan delivering air to said chamber, a passage supplying air to said fan a heating device in the path of air so supplied, a second passage also supplying air to said fan, a valve closing said second passage, and two thermostats located in the path of air coming from both said passages and successively controlling said valve and heating device, respectively.

3. The combination with the compartment having two openings admitting air thereto, of a heating device placed in one opening, a valve closing the other opening, a chamber at some distance from said openings and separated by a partial partition into two cells, each having an exit-opening, valves closing respectively the exit-openings, a heater in one of said cells, a fan arranged to take air from said compartment and force it into said chamber, and two thermostats located in the non-heated cell and controlling respectively said heating devices and the valve closing said other opening admitting air to the compartment.

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

CHARLES P. NOBLE.

Witnesses:
WALLACE GREENE,
HARRY BARTON.