

No. 690,485.

Patented Jan. 7, 1902.

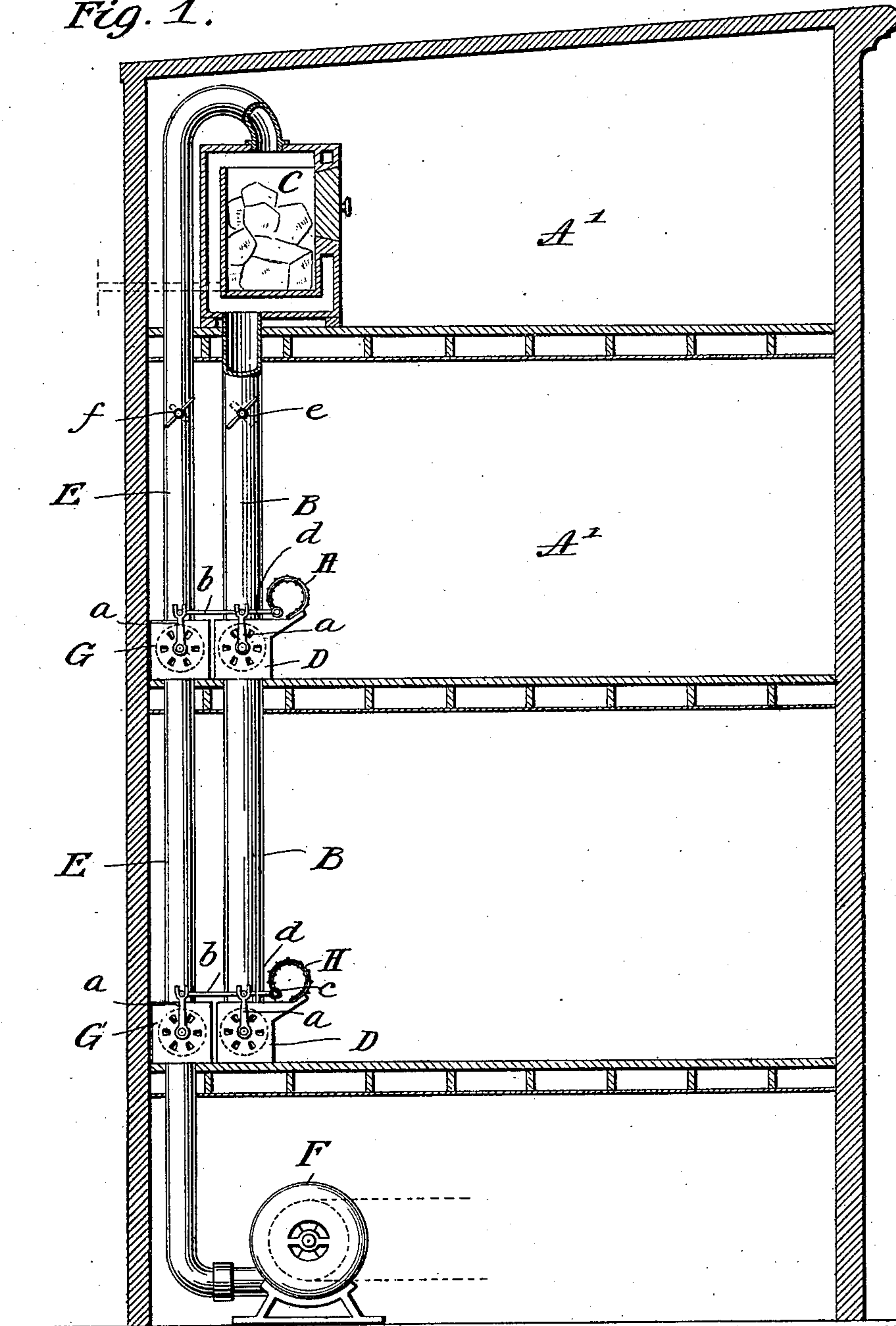
J. & W. TITUS.

APPARATUS FOR COOLING AND VENTILATING.

(Application filed May 1, 1901.)

(No Model.)

Fig. 1.



WITNESSES:

Frank O. Ober.

Amasa Whitney.

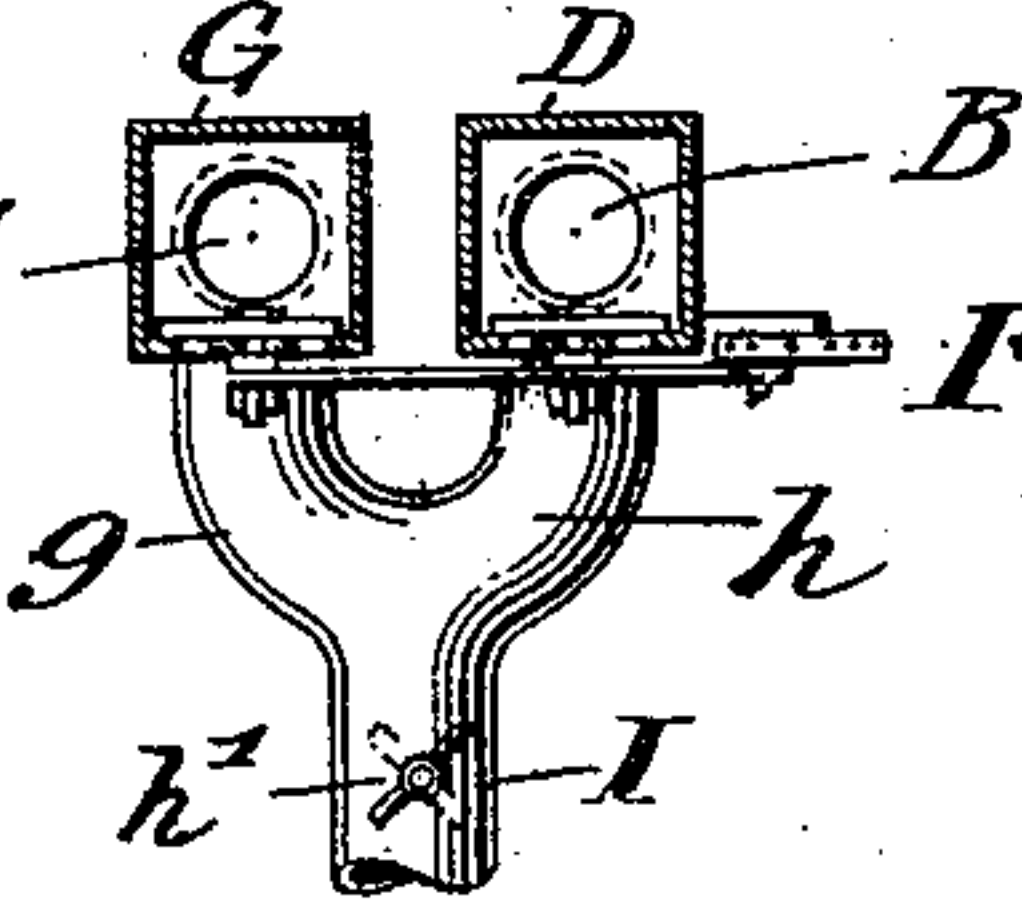


Fig. 2. John Titus.

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UNITED STATES PATENT OFFICE.

JOHN TITUS, OF OYSTER BAY, AND WILLIAM TITUS, OF OLD WESTBURY,
NEW YORK.

APPARATUS FOR COOLING AND VENTILATING.

SPECIFICATION forming part of Letters Patent No. 690,485, dated January 7, 1902.

Application filed May 1, 1901. Serial No. 58,249. (No model.)

To all whom it may concern:

Be it known that we, JOHN TITUS, a resident of Oyster Bay, and WILLIAM TITUS, a resident of Old Westbury, in the county of Nassau and State of New York, citizens of the United States, have invented certain new and useful Improvements in Apparatus for Cooling and Ventilating; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a diagrammatic view showing certain combinations and arrangements of parts included in our invention. Fig. 2 is a detail horizontal sectional view still further illustrating our said invention.

This invention is designed for use in dwellings, hospitals, apartment-houses, and other structures in which effective ventilation with more or less refrigerated air is desirable.

It comprises certain new and useful combinations of parts whereby cooled air or cooled air combined with air of normal temperature to any desired degree may be provided to a room or suite of rooms or within structures of any suitable kind.

A' indicates stories of a house or structure of any suitable kind. Extended upward to the requisite height, whether one or more stories of the structure, is a cold-air tube or shaft B, which at its upper part terminates in a refrigerating-chamber C. This chamber may be furnished with any suitable means for cooling air which is passed into and through the same. As shown in the drawings, Fig. 1, a simple ice-box placed in a loft above the rooms to be ventilated or cooled, with the cold-air shaft extended downward from the bottom of said box, is employed. As various and differing means of cooling air passed through a refrigerating box or chamber are known in the art of refrigeration, the same call for no specific description here. In the cold-air shaft B, preferably one or more at each story to be ventilated, cooled, or regulated in temperature, is a register D for admitting a regulated quantity of air to the adjacent room or place to be cooled by refrigerated air from said shaft. These registers

may be of any preferred or suitable construction; but, as shown in the drawings, Fig. 1, they are of the circular variety, turning upon an axial pivot and each provided with a radial arm *a*, whereby movement may be given to the movable part of the register to enlarge or diminish the outlet therethrough to increase or diminish the outflow of air therefrom, as occasion may require. As registers of this and other constructions are well known, no specific description thereof seems to be here required.

Placed in due relation with the cold-air shaft B is an air-pipe E, which at its upper end connects with the refrigerating-chamber C in such a manner that air issuing from said upper end of the pipe is cooled by or during its passage through the chamber. Provided in the air-pipe E, to propel atmospheric air therethrough to and into the refrigerating-chamber C, is a fan-blower or other air-forcing mechanism F. From the refrigerating-chamber the air descends through the air-shaft B to the register thereof, where it may issue to the adjacent room or apartment A. In the air-pipe E, properly adjacent to each register D thereof, is a corresponding register G, the office of which is to permit air at, say, normal temperatures in regulated quantities to issue from the air-pipe E into the adjoining room or apartment of the structure to be ventilated. Each register G of the air-pipe should be placed in such juxtaposition with a register D of the cold-air shaft that motion communicated to one of said registers may be simultaneously transmitted to the other. This may be conveniently provided for by means of a connecting-rod *b*, which extends from the outer part of the arm *a* of one register to the corresponding part of the arm *a* of the other. It is preferred that this rod be made detachable, so that the two registers may be independently manipulated when exceptional circumstances require. Provided in each room A is a thermostat H, the free end *c* of which connects by a rod *d* with one of the arms *a* of one of the registers, so that movements of said free end of the thermostat will automatically actuate the two registers in unison. As shown in the drawings, the

thermostat is of the well-known construction, composed of two united burred strips of metal having different ratios of expansion from heat; but the variety of thermostat to be employed is a matter of choice, and the devices for transmitting movement therefrom to the registers—one or both—may be varied within wide limits. The precise means for transmitting such motion is of no moment so long as they effect the requisite movements of the register or registers from the operation of the thermostat. A damper *e* may be provided in the cold-air shaft to throttle the passage of air therethrough when desired, and a similar damper *f* may be provided for a like purpose in the air-pipe. To provide for distribution from the cooled-air shaft and the air-pipe to points more or less remote from the registers, the latter may have conduit-pipes *g h* extended therefrom, as shown in Fig. 2, to conduct the air, and when desired these conduit-pipes may connect with a distributing-trunk *I*, in which may be a damper *h* to retard, if occasion demands, the flow of air therethrough.

The operation of the apparatus is as follows: The refrigerating-chamber *C* being supplied with ice, as indicated at *i*, or otherwise arranged to refrigerate, as hereinbefore explained, and the blower *F* being set in operation to force a current of atmospheric air upward through the air-pipe, a portion of said air enters the refrigerating-chamber and being there cooled or refrigerated descends therefrom into and through the cold-air shaft to the registers thereof. Simultaneously with this a portion of the air forced upward in the air-pipe passes out through the registers of the latter, so that there is a simultaneous discharge in immediate connection with each other of a current or currents of air at normal temperature from the air-pipe and a current or currents of cooled air from the air-shaft in such relation with each other that the cold air practically tempers the other, and vice versa, so that any desired degree of coolness in the room or apartment *A* may be obtained by a perfectly regulated proportion between the inflows of air from the air-pipe and the cold-air shaft. The proportion of air propelled through the registers of the air-pipe may be controlled by the damper *f*, which may be turned or adjusted to offer sufficient resistance to the current through the air-pipe and yet supply air in sufficient quantity to the refrigerating-chamber for the purpose described. The rapidity of descent of the cooled air through the cold-air shaft may in a similar manner be adjusted by the damper *e* therein.

The registers of the air-pipe being connected with the adjacent register of the cooled-air shaft and both being connected with a thermostat, as described, the latter may be readily adjusted to operate at a predetermined temperature in the room or apartment *A* to simultaneously actuate the two registers

to admit the requisite proportions of air at normal temperature from the air-pipe and cooled or refrigerated air from the cooled-air shaft.

It will be observed that when the temperate and the chilled air meet in the tube or conduit *I* (shown in Fig. 2) they mingle and mutually react so that the temperature of the air in said conduit, at the outlet or place of delivery of said air, is below that of the air from the shaft *E* and above that of the air from the cold-air shaft *B*, the desired temperature of the volume of air delivered from the conduit *I* being obtained by adjusting the various relative proportions of temperate and chilled air passed into the conduit *I* from the two shafts *E* and *B*, the conduit *I* constituting, so to speak, a "mixing-chamber" located between the shafts *E* and *B* and the outlet of the mingled volumes place or apartment to which the tempered air is to be delivered.

What we claim as our invention is—

1. The combination with an apartment, a vertical cold-air shaft having a register communicating with the apartment, and a closed refrigerator at the top of said air-shaft and communicating therewith, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apartment, and a blower at the lower part of the air-pipe for forcing air upward into the refrigerator through the air-pipe and thence through the register of the cold-air shaft into the apartment simultaneous with the exit of air from the air-pipe into the apartment through the register of said pipe, substantially as herein set forth.

2. The combination with an apartment, a vertical cold-air shaft having a register that communicates with the apartment, a closed refrigerator at the top of said cold-air shaft and communicating therewith, and a throttling-damper placed in the cold-air shaft for adjusting the descent of cold air therethrough, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apartment, a blower at the lower part of the air-pipe for simultaneously forcing air into the apartment from the air-pipe and the cold-air shaft through the respective registers thereof, substantially as herein set forth.

3. The combination with an apartment, a vertical cold-air shaft having a register that communicates with the apartment, a closed refrigerator at the top of the cold-air shaft and communicating therewith, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apartment, a blower at the lower part of the air-pipe for simultaneously forcing air into the apartment from the air-pipe and the cold-air shaft through the respective registers thereof, and a throttling-damper placed in the air-pipe

for controlling the proportion of air passed through the register of said pipe, substantially as herein set forth.

4. The combination with an apartment, a
5 vertical cold-air shaft having a register that communicates with the apartment, a closed refrigerator at the top of the cold-air shaft and communicating therewith, and a throttling-damper placed in the cold-air shaft for ad-
10 justing the descent of cold air therethrough, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apartment, a blower at the lower part
15 of the air-pipe for simultaneously forcing air into the apartment from the air-pipe and the cold-air shaft through the respective registers thereof, and a throttling-damper placed in the air-pipe for controlling the proportion of air
20 passed through the register of said pipe, substantially as herein set forth.

5. The combination with an apartment, a vertical cold-air shaft having a register communicating with the apartment, and a closed
25 refrigerator at the top of said air-shaft and communicating therewith, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apart-
30 ment, a blower at the lower part of the air-pipe for forcing air upward into the refrigerator through the air-pipe and thence through the register of the cold-air shaft into the apartment simultaneous with the exit of air from
35 the air-pipe into the apartment through the register of said pipe, and thermostats connected with the registers of the air-pipe and cold-air shaft respectively to operate the same in unison in the admission of air to the apart-
40 ment, substantially as herein set forth.

6. The combination with an apartment, a vertical cold-air shaft having a register that communicates with the apartment, a closed
45 refrigerator at the top of the cold-air shaft and communicating therewith, and a throttling-damper placed in the cold-air shaft for adjusting the descent of cold air therethrough, of a vertical air-pipe the upper part of which communicates with the closed refrigerator
50 and which has a register that communicates with the apartment, a blower at the lower part of the air-pipe for simultaneously forcing air into the apartment from the air-pipe and the cold-air shaft through the respective
55 registers thereof, a throttling-damper placed

in the air-pipe for controlling the proportion of air passed through the register of said pipe, and thermostats connected with the registers of the air-pipe and cold-air shaft respectively to operate the same in unison in the admis- 60
sion of air to the apartment, substantially as herein set forth.

7. The combination with an apartment, a vertical cold-air shaft having a register communicating with the apartment, and a closed 65
refrigerator at the top of the said air-shaft and communicating therewith, of a vertical air-pipe the upper part of which communi-
cates with the closed refrigerator and which has a register that communicates with the 70
apartment, and a blower at the lower part of the air-pipe for forcing air upward into the refrigerator through the air-pipe and thence through the register of the cold-air shaft into the apartment simultaneous with the exit of 75
air from the air-pipe into the apartment through the register of said pipe, a distributing-trunk and conduits which connect the trunk with the registers of the air-pipe and of the cold-air shaft respectively to commin- 80
gle the air from the said pipe and said air-shaft prior to its admission to the apartment, substantially as herein set forth.

8. The combination with an apartment, a vertical cold-air shaft having a register that 85
communicates with the apartment, a closed refrigerator at the top of the cold-air shaft and communicating therewith, and a throttling-damper placed in the cold-air shaft for
adjusting the descent of cold air there- 90
through, of a vertical air-pipe the upper part of which communicates with the closed refrigerator and which has a register that communicates with the apartment, a blower at the lower part of the air-pipe for simultane- 95
ously forcing air into the apartment from the air-pipe and the cold-air shaft through the respective registers thereof, a throttling-damper placed in the air-pipe for controlling the proportion of air passed through the register 100
of said pipe, a distributing-trunk, and conduits which connect the trunk with the registers of the air-pipe and the cold-air shaft respectively, substantially as herein set forth.

JOHN TITUS.
WILLIAM TITUS.

Witnesses:

H. G. HAYWARD,
E. LUDLAM.