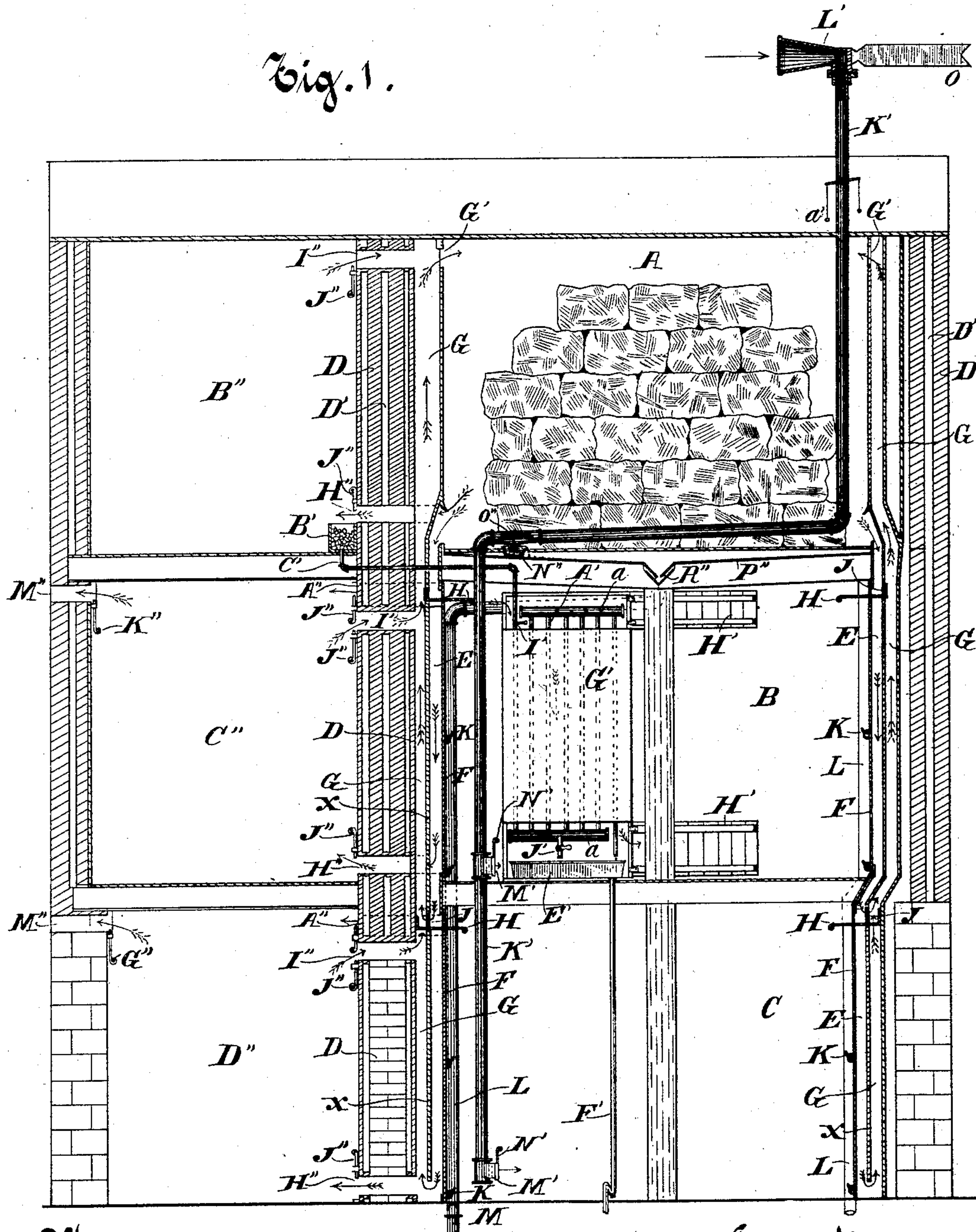


A. I. DEXTER.
REFRIGERATOR BUILDING.

No. 371,180.

Patented Oct. 11, 1887.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

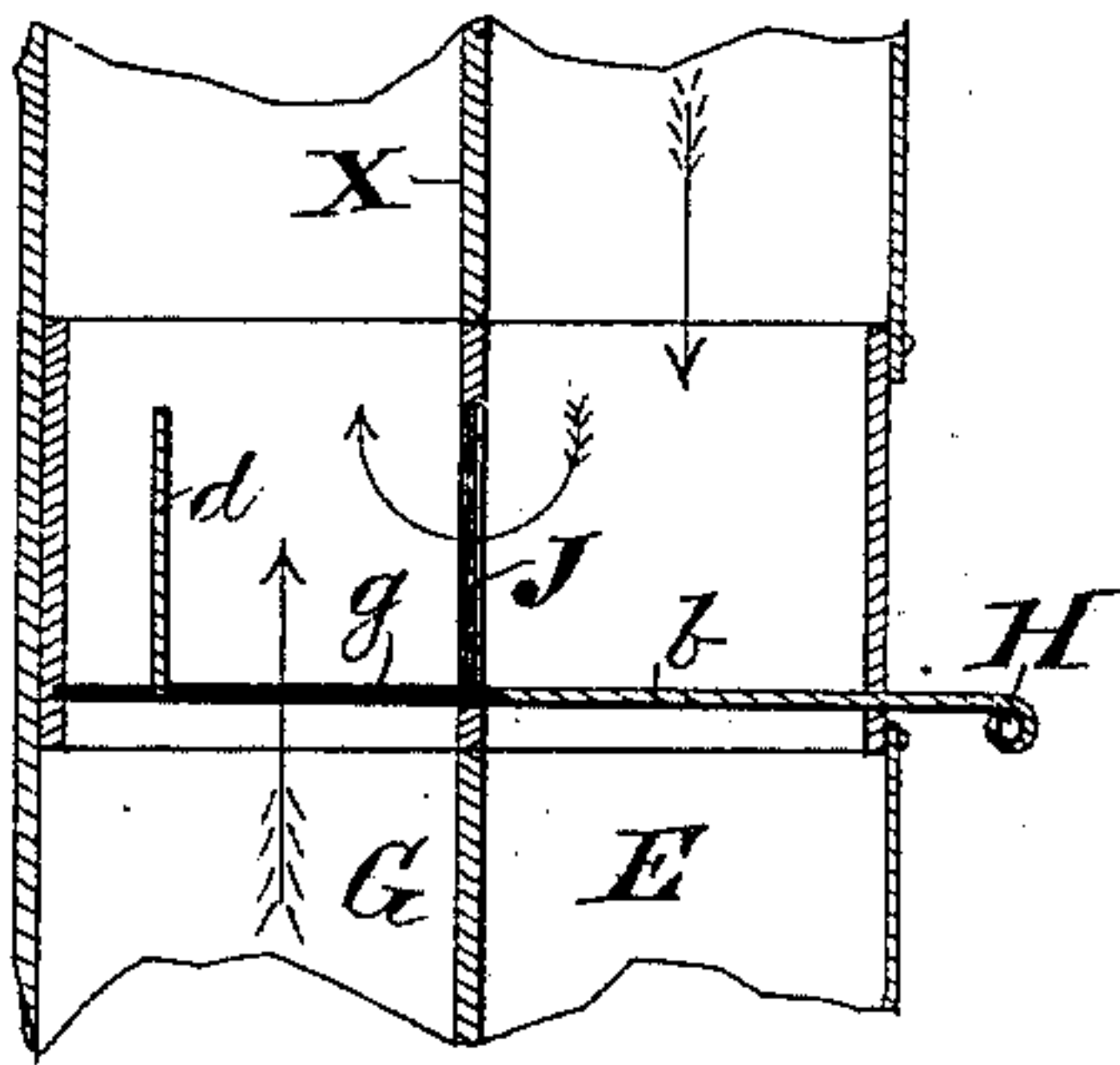


Fig. 2.

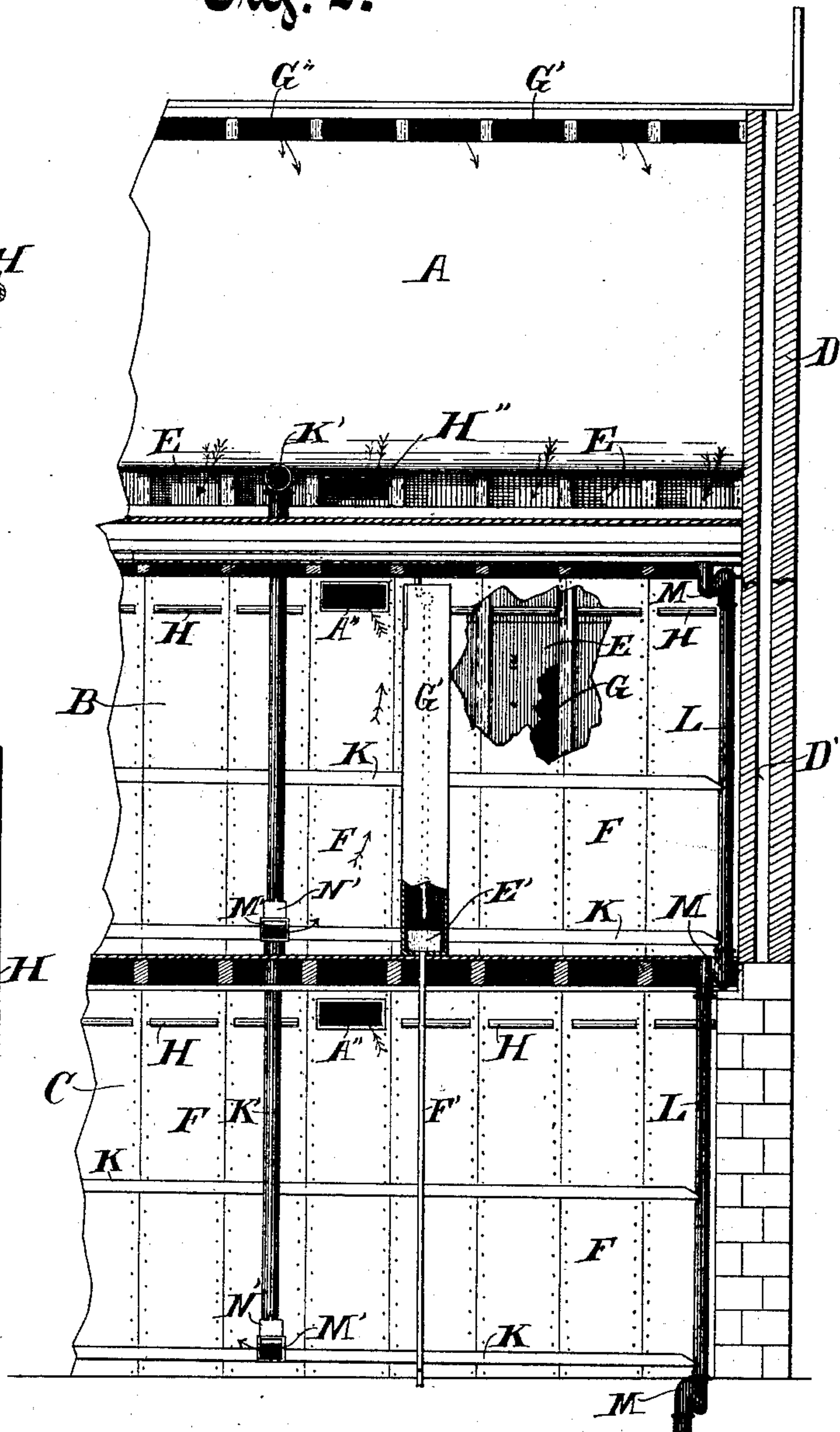
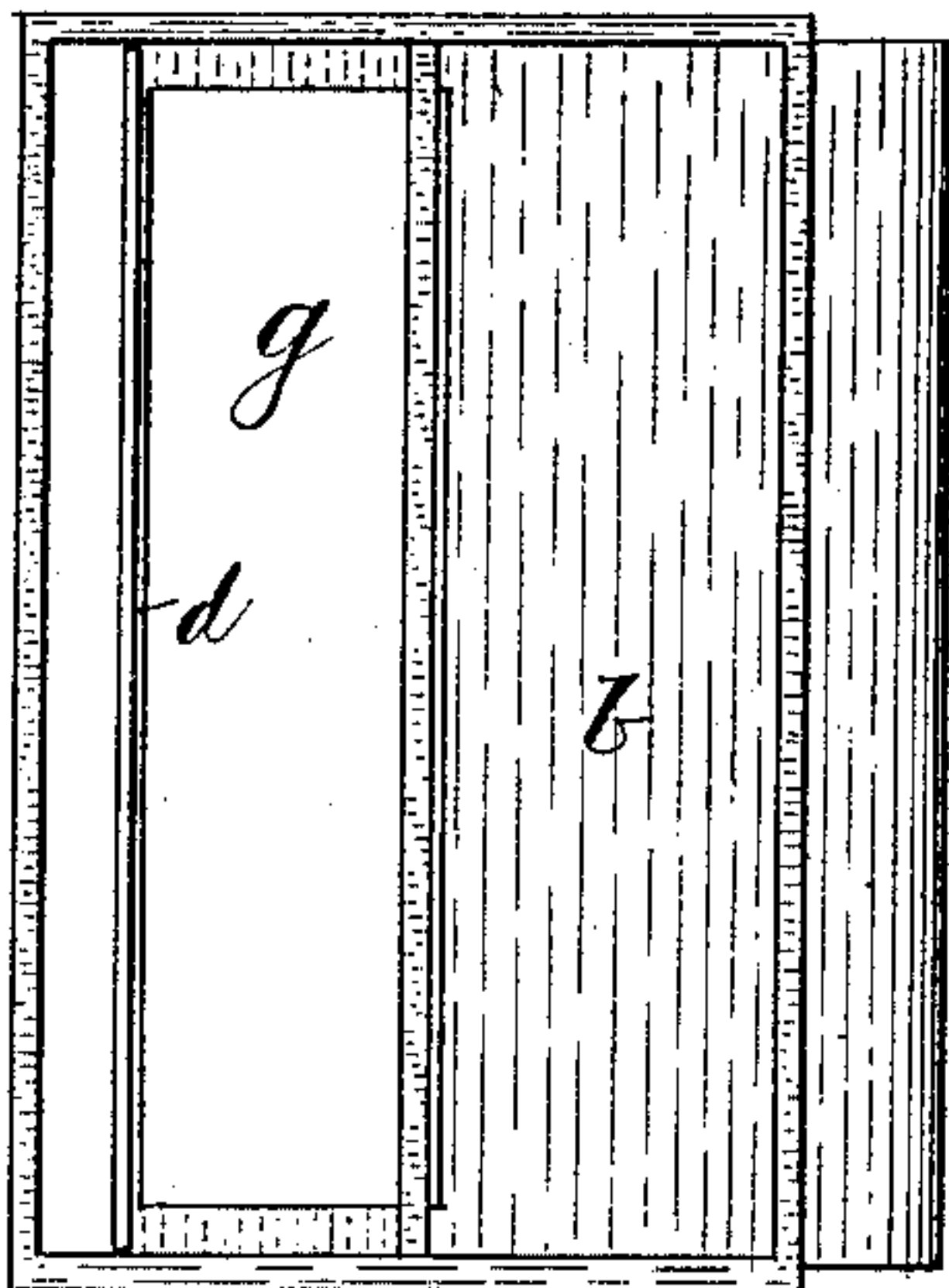


Fig. 4.



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UNITED STATES PATENT OFFICE.

AVELYN I. DEXTER, OF WHITEWATER, WISCONSIN.

REFRIGERATOR-BUILDING.

SPECIFICATION forming part of Letters Patent No. 371,180, dated October 11, 1887.

Application filed May 26, 1887. Serial No. 239,430. (No model.)

To all whom it may concern:

Be it known that I, AVELYN I. DEXTER, of Whitewater, in the county of Walworth and State of Wisconsin, have invented new and useful Improvements in Refrigerator-Buildings; 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 or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in refrigerators; and it pertains more especially to that class which, when formed on a large scale, comprises the several stories of a building.

The several more important objects of my invention are as follows: first, to provide for cooling the several lower rooms or apartments below the ice-chamber through a metallic wall or other conductor without permitting the cold air to enter such apartment from the ice-chamber; second, to provide devices by means of which the course of the cold air as it descends from the ice-chamber may be conducted to and cool the first apartment below without cooling the other apartments, or, if desired, conducted to all the apartments below the ice-chamber; third, the combination and arrangement of cold-air ducts and cut-off slides by which the cold air may be caused to pass from the cooling-walls of the system proper to adjoining side rooms formed in combination therewith, whereby said side rooms may be cooled by direct contact with the cold air; fourth, the combination and arrangement, with this system, of a chemical refrigerator for condensing moisture in all the apartments below the ice-chamber, and the system of ducts and pipes by which the moisture thus condensed is conducted from the refrigerator.

The construction of my invention is further explained by reference to the accompanying drawings, in which—

Figure 1 represents a vertical section thereof. Fig. 2 also represents a vertical section drawn at right angles to that shown in Fig. 1. Fig. 3 represents a vertical section of one of the air-regulating slides, several of which are provided in each apartment. Fig. 4 repre-

sents a top view of one of the air-regulating slides shown in Fig. 3.

Like parts are represented by the same reference-letters throughout the several views. 55

A represents the ice-chamber located in the upper story of the building, in which a large quantity of ice is stored away during the winter months and permitted to remain for the purpose of cooling the lower apartments, B and C, of the refrigerator during the warmer season of the year. 60

D D are the walls of the refrigerator proper, which are provided with non-circulating air-spaces D', which serve to prevent the transmission of heat or cold through the wall. 65

The cold air from the chamber A, in passing to the lower apartments, B and C, descends through the cold-air ducts E E, which are formed between the walls X and the metallic cooling-walls F upon one or all of the several sides of such apartments, whereby a very low temperature is produced in said rooms B and C without permitting the circulation of air through them. When the cold air which has descended through the duct E to the lower apartments becomes slightly warm, it passes up through the air-duct G between the walls X and D and escapes from thence through the air-passage G' into the top of the ice-chamber A. Thus the air is caused to continuously circulate from the ice-chamber to and from the cooling-walls of the lower apartments, whereby a low temperature is maintained in said lower apartments. 70
When desirous to shut off the cold air from both of the lower apartments, B and C, entirely, the upper slides H H are pushed inward, whereby the downward passages E E are closed and the cold air is excluded. If, however, it is desirous to cool the apartment B without cooling the apartment C, the upper slides H H are drawn outward in the position shown in Fig. 1, and the lower slides H H are pushed inward in the position shown, whereby the cold air descends to the bottom of the apartment B only, and is arrested at such point by lower slides H H, when, as it rises in temperature, it passes from the air-duct E through the opening J, above the lower slide H, and from thence upward, returning to the ice-chamber through the passage G'. Thus it is 75
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obvious that by the use of the slides H, I am enabled to either exclude the cold air entirely from the store-rooms or apartments B and C or to conduct it to either one or both of them, 5 as may be desired.

The metallic cooling-walls F are provided at short intervals with horizontally-arranged troughs K, which serve to catch moisture, which condenses in drops of water as it descends 10 upon the surface of said walls and conducts it through the ducts L from the building. The ducts L are provided with hydraulic traps M between the several apartments, which, while they permit the water to descend through said 15 ducts L, prevent the air from circulating through said pipes or ducts from one apartment to another.

As an additional means for carrying off the accumulation of moisture from the store rooms, 20 I have provided a chemical refrigerator or apparatus by which the moisture in the room is first caused to congeal upon the exterior surfaces of a series of cold-air pipes, when it is melted, as hereinafter described, and conducted 25 from the refrigerator.

A' represents the series of cold-air pipes, located in one of the store-rooms of the refrigerator. Two or more may, however, be employed, as circumstances require. The series 30 of pipes A' are connected with the chemical refrigerator or ice-receptacle B' by the cold-air duct C'. As a convenient method of lowering the temperature in the refrigerator, salt and ice may be employed in the refrigerator B'. The 35 cold produced in the refrigerator B' passes down through the pipes C' to the series of pipes A'. The series of pipes A' are connected together at their respective ends in the ordinary manner by the horizontal pipes a a, whereby the cold 40 air or water, as the case may be, in descending from the refrigerator or receptacle B', passes through all of said pipes in the series A', and from thence out through the last pipe in said series, and is discharged above the tank E'. 45 Water thus accumulating in the tank E' is conducted therefrom through the discharge-pipe F'. The series of pipes A' are surrounded by an air-tight inclosure, G', which inclosure is provided with closely-fitting doors H' H'. 50 While congealing the moisture upon the pipes A' the doors H' H' are thrown open, so that the moisture in the apartment may accumulate and congeal upon said series of pipes A'. When, however, the moisture has thus been 55 congealed upon the pipes A', the doors H' H' are closed and the stop cock I' in the pipe C' is also closed. This being done, the cold air from the refrigerator is excluded from the inclosure G' and the pipes A', when the ice which 60 has been accumulated upon the pipes A' melts and flows from the surface of said pipes into the tank E', and from thence it is conducted through the pipe F' away from the refrigerator or building. This process of congealing moisture may be repeated as often as circumstances 65 may require, and the apparatus shown and de-

scribed may be located in any or all of the several apartments of the building.

J' is a cock which is connected with the series of pipes A', which is provided for carrying off the accumulations of water from the series of pipes A', water from said pipes being 70 discharged therefrom into said tank E'.

As a means for ventilating the several apartments or store-rooms of the refrigerator, I have 75 provided the air-pipe K', the upper end of which is located above the building and is provided with a funnel-shaped nozzle, L', through which the air enters said pipe K', and passes down through said pipe and is discharged in such apartments as may be desired 80 through the passages M'. The passages M' are provided with slides N', by which the escaping of air therefrom is controlled. The pipe K' passes through the ice-chamber A in its 85 way to the several apartments to be ventilated, whereby the air in said pipe K', is cooled and caused to descend and be discharged into said lower apartments, while fresh air is thereby caused to flow into said pipe K', at its 90 upper end. To facilitate and promote the circulation of air through the pipe K', the inlet-nozzle L' is provided with a vane, O, and is mounted upon a rotating support, whereby the 95 mouth of said nozzle L' is retained toward the wind and the downward current of the air through said pipe K' is promoted. When thus ventilating the lower apartments, it becomes necessary to open a communication from them 100 to the exterior air.

A'' A'' (shown in Fig. 2) represent the exterior air-passage, from which the fresh air which enters through the pipe K' escapes from the apartments B and C.

B'', C'', and D'' are side store-rooms used in 105 combination with my refrigerator proper, and are cooled and ventilated by the air which has first passed through or around the refrigerator proper, as indicated by arrows.

When desirous to cool the room D'', the 110 slides J'' are opened, as shown in Fig. 1, and the slide G'' is closed, when the cold air passes down through the duct E and enters the apartment D'' through the passage H'', and from thence out through the passage I'', returning 115 to the ice-chamber A through the passage G. Cold air is in like manner conducted to and from the apartment B'' through passages H'' and I''; also, when desirous to cool the apartment C'', the slides J'' J'' of such apartment are 120 opened, as shown in Fig. 1, and the slide K'' is closed. When, however, it is desirous to ventilate either of said apartments C'' or D'', the slides G'' and K'' are opened, when the air, entering the apartments B and C through the 125 pipe K', as stated, passes from thence outward through the passage A'' A'' into said rooms C'' and D'', and from thence to the exterior air through the passages M'' M''. As the moisture from the descending atmosphere accumulates 130 in the pipe K', it flows downward to and is discharged into the trap N'' through the nozzle

O'', when it flows therefrom along the upper surface of the metallic roof P'' and escapes therefrom through the trough R'' to one of the discharge-pipes L.

5 The several series of slides H (shown in the enlarged views in Figs. 3 and 4) consist of the horizontal plate *b*, which serves to control the course of the air through the vertical air-passages E and G, and the vertical plate *d*, which
 10 serves to control the passage of air through the ducts J, formed in the partition X between the passages E and G. Thus it is obvious that when the slide H is in the position shown in Fig. 3 the downward current of air
 15 in the passage E is closed by the plate *b*, whereby the air is caused to take an upward course, as indicated by the curved arrow in Fig. 3, from the passage E up through the passage G. When, however, the slide H is
 20 drawn out, the vertical plate *d* closes the passage J, whereby the air is prevented from entering said upward passage G, but instead is permitted to continue on down through the opening *g* to the lower apartments of the
 25 building, when it passes up in rear of the vertical plate *d*, whereby it is obvious that the current of air may be controlled in its course to either one or both of the store-rooms, as stated.

30 The pipe K' is provided with a damper, *a'*, of ordinary construction, by which the downward current of air in said pipe is controlled or excluded at will.

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

1. In a refrigerator having an ice-chamber, one or more store-rooms or apartments located below said ice-chamber, and non conducting
 40 exterior walls, the combination, with the exterior walls of said apartment, of a sheet-metal cooling wall or partition located at a slight distance from said exterior walls, and an intermediate wall or partition located between
 45 said sheet-metal cooling-walls and said exterior walls, thereby forming both downward and upward flues or air-passages between said sheet-metal cooling-wall and the exterior walls, through which passages cold air is conducted
 50 from the ice-chamber downward in one passage along said cooling-walls of the several apartments and returned through the other passages to said ice-chamber as its temperature is raised, whereby the several apartments
 55 located below the ice-chamber are cooled indirectly by said cold air through said sheet-metal cooling-wall without permitting the air to enter said apartments, substantially as and for the purpose specified.

60 2. The combination, in a refrigerator having an ice-chamber and one or more store-rooms inclosed by non-conducting exterior walls, of metallic cooling-walls located near the exterior walls of the several lower apart-
 65 ments, forming cold-air spaces communicating from said ice chamber around said lower

apartments within their inclosed walls, one or more drip-troughs affixed to the inner surface of said cooling-walls, and a discharge-pipe, with which the discharging ends of said drip-
 70 troughs communicate, whereby the accumulation of moisture upon the interior of said cooling-walls is conducted from the several apartments provided with said cooling-walls, substantially as and for the purpose specified. 75

3. The combination, in a refrigerator having an ice-chamber, A, and one or more store-rooms, B and C, inclosed by non-conducting exterior walls, of a metallic cooling-wall, F, an intermediate wall or partition, X, located
 80 between said cooling-wall and the inclosing-wall, one or more flues or air-passages, J, formed in said partition X, and slide H, having horizontal plate *b* and vertical plate *d*, said plate *b* being adapted, when the slide is
 85 pushed rearward, to close the air-space between said wall X and the cooling-wall, and said plate *d* being adapted, when said slide is drawn out, to close said passage J, whereby the downward and upward current of air from
 90 said ice-box to and from said store-rooms is controlled, substantially as and for the purpose specified.

4. The combination, in a refrigerator having an ice-chamber and one or more store-rooms
 95 or apartments located below said ice-chamber, of the ventilating-pipe K', protruding at its upper end through the roof or upper wall of the refrigerator and extending downward through the ice-chamber and from thence to
 100 the several apartments to be ventilated, passages M', communicating from said ventilating-pipe K' with the several apartments, slides N', closing said passages M', damper or cut-off *a'*, located in said pipe K' near its upper end
 105 and adapted to control the admission of air through said pipe, discharge-nozzle O'', and trap N'', through which trap the water condensing in said pipe K' is discharged, substantially as and for the purpose specified. 110

5. The combination, in a refrigerator having an ice-chamber and one or more store-rooms located beneath the same provided with non-conducting exterior walls and a metallic cooling-wall located at a slight distance from said
 115 exterior walls, thereby forming cold air spaces between said cooling-wall and said exterior walls for the admission of cold air, of one or more secondary adjoining apartments B'', C'', and D'', provided, respectively, at their lower
 120 ends with inlet cold air passages H'', communicating with the cold-air space of the refrigerator proper, and at their upper ends with outlet air-passages I'', communicating with the ice-chamber A, said lower and upper passages,
 125 H'' and I'', being provided with air-controlling valve-slides J'', by which arrangement of the apartments said secondary or adjoining apartments may be cooled by direct contact with the
 130 air from the cold-air spaces of the refrigerator proper, while the air thus circulating serves to cool the store-rooms of the refrigerator

proper indirectly through the metallic cooling-wall without entering said store-rooms, substantially as and for the purpose specified.

6. In a refrigerator, an ice-chamber and
5 one or more store-rooms located below the ice-chamber and adapted to be cooled indirectly through a metallic wall by the cold air from the said ice-chamber, in combination with one or more secondary or adjoining store-
10 rooms provided with cold-air ducts communicating therefrom with the cold-air space around said first-mentioned store-rooms, and with outlet air ducts communicating with the

upper part of said secondary store-rooms and with the exterior air, said inlet and outlet ducts 15 being respectively provided with slides or doors by which the admission and escape of the air thereto are controlled, substantially as and for the purpose specified.

In testimony whereof I affix my signature in 20 presence of two witnesses.

AVELYN I. DEXTER.

Witnesses:

GEO. W. STEELE,
T. D. WEEKS.