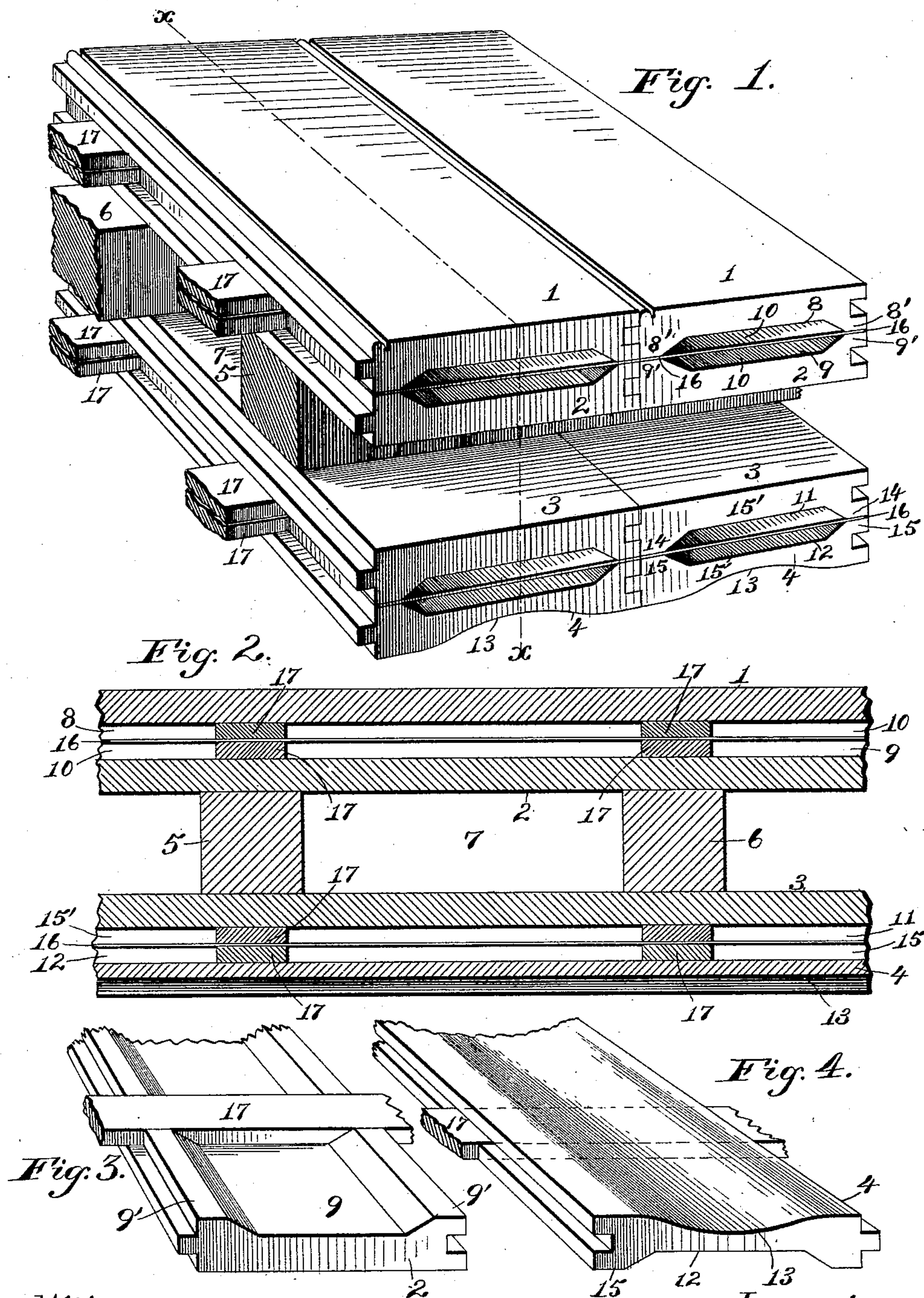


(No Model.)

M. S. MILLARD.
CONSTRUCTION OF WALLS.

No. 475,593.

Patented May 24, 1892.



Witnesses;
Riley C. Bowen.
H. J. Berukard

Inventor;
Martin S. Millard,
By *Edson Bros.,*
Attorneys.

UNITED STATES PATENT OFFICE.

MARTIN S. MILLARD, OF KANSAS CITY, MISSOURI.

CONSTRUCTION OF WALLS.

SPECIFICATION forming part of Letters Patent No. 475,593, dated May 24, 1892.

Application filed September 10, 1891. Serial No. 405,333. (No model.)

To all whom it may concern:

Be it known that I, MARTIN S. MILLARD, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in the Construction of Walls; 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 present invention relates to improvements in the construction of walls, floors, and other surfaces, especially adapted for refrigerator-cars and other structures; and its object is to secure maximum strength with minimum weight, and to secure to a high degree a non-conductor of heat.

With these ends in view the invention consists in the construction and arrangement of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

The present improvement is more particularly designed for use in the construction of freight-cars, although it is capable of use with advantageous results in the construction of other classes of refrigerators and other structures, and among its advantages in a car it possesses the following: It is not possible to obstruct the free circulation of air within the car by any arrangement or disposition of the load or articles of freight, thus dispensing with racks or guards usually employed in cars for spacing off the load to insure circulation, and the accumulation of mold is prevented no matter how damp or wet the articles or load may be when placed in the car. This improvement, while it adds greatly to the purity and cleanliness of the car, in no wise impairs its strength or increases its weight or expense.

I have illustrated my improvement in the accompanying drawings, in which—

Figure I is a perspective view of a portion of a wall or floor embodying my invention. Fig. II is a vertical sectional view thereof on the plane indicated by the dotted line *xx* of Fig. I. Fig. III is a detail perspective view of the outside board, and Fig. IV is a similar view of the inside-lining board.

Like numerals of reference denote corresponding parts in all the figures of the drawings.

In constructing my wall or floor in connection with a refrigerator-car or a freight-car, after taking in view all the bracing necessary to impart the requisite strength and stability, the next step is to have all openings divided into an infinite number of small polygonal openings by means of light girts gained into the posts and braces, these girts being the same in width as the thickness of the posts and braces. The girts not only serve the purpose of subdivisions of air-spaces, but add materially to the strength and stiffness of the frame, and when the frame is sheathed on both sides the girts and boards form a very large number of independent small dead-air cells or spaces. After this has been completed I apply the matched material.

1 2 designate the outside finish of the wall of a car or other structure, and 3 4 are the boards or planks forming the inside finish of the wall or floor. The boards 1 1 are joined by tongue-and-groove joints in the usual manner, and the several layers of boards forming the outside and inside finish are likewise joined, as will be readily understood by those skilled in the art. The outside-finish boards 1 2 and the inside boards 3 4 are separated by means of the girts or timbers 5 6, as seen in Figs. I and II, thus forming a dead-air cell or space 7 between the inside and outside finish of the wall of the car. The board or plank 1 is formed with a longitudinal central channel 8, which provides two parallel flanges 8' 8', said channel and flanges being on the inside surface of the board, and the board 2 is provided on its upper surface with a similar channel 9, arranged centrally to provide two flanges 9' 9'. The boards 1 2 are laid one on top of the other to cause the two flanges 8' 8' and 9' 9' to abut together and the two channels 8 9 to coincide or register, thus forming a dead-air passage or cell 10 between the abutting surfaces of the two boards. It will be seen that there is a longitudinal dead-air space 10 formed between and by each pair of abutting boards or planks 1 2, and as the entire side walls and the floor and ceiling are formed by these boards or planks it is evident that a vast number of these cells are provided in the car, which tends to make the same a non-conductor of heat to a very great degree.

The inner lining formed by the boards 3 4

is similarly constructed—that is, the board 3 is provided with a longitudinal channel 11 on its lower surface and the board 4 formed with a similar channel 12 on its upper surface and with a channel 13 on its lower surface. The flanges 14 15, formed by the channels 11 12 on the opposing surfaces of the boards 3 4, abut or bear against each other, and thus the channels are brought into coincidence and form the air-space 15. The air-spaces 10 15 between the boards of the inner and outer linings are further subdivided by the fragile partitions 16 and by the parting-strips 17. The fragile partitions are arranged longitudinally of the boards, so as to divide the channels or spaces 10 15 into longitudinal divisions, and said partitions also extend between the flanges of a number of the boards or planks, as shown. The parting-strips are arranged in reverse order to the longitudinal partitions or at right angles to the length of the partitions and the boards, and said parting-strips are set in gains or notches formed in the flanges of the planks or boards, as shown. These longitudinal partitions and the transverse parting-strips still further multiply the number of air cells or spaces, and the area or size of the cells is materially reduced, thus securing to a better extent the end sought after—namely, a vast number of dead-air cells or spaces in a wall, floor, or ceiling, whereby its non-conductivity of heat is increased without sacrificing stability or strength. It will be noted that the inner or exposed side of the inner board 4 of the inside lining is corrugated or fluted, and as the whole interior of the car is lined with the form of board 4 it will be understood that the car presents a fluted or corrugated appearance, which is very important in freight-cars and other places where it is desired to maintain a constant circulation or motion of the air to prevent the accumulation of mold while the load is in transit. The tongue-and-groove joints and the inner surface of the first course of matched material 1 2 should be thoroughly coated with a suitable paint or other substance to make all the joints perfectly airtight, and the fragile partitions should be made of the best quality of strong building-paper, although any other material suitable for the purpose may be used. If the outside finish 1 2 is put on the car longitudinally, which is rarely the case, care must be taken that all the splices are made at the center of the parting-strip. The board 4, which is designed for the interior finish, should be made somewhat thicker than the other boards or planks to compensate for the weakening arising from the formation of the channels in both sides thereof. The floor and ceiling are constructed on the same general plan, except that the floor may be made of thicker material and of a hard durable wood.

With the parts constructed and arranged as herein shown and described it is not possible to trap or shut off the circulation of air

from any part of the car by any arrangement of the freight or load, nor is there the same tendency to mold as there is when packing-cases are placed in close juxtaposition upon a perfectly flat floor.

The improvement is equally adapted to the construction of all manner of refrigerators and buildings in which atmospheric purity is desired and to the construction of dead walls and floors, as the same principle that makes the wall a non-conductor of heat makes it also applicable to the non-conduction of sound.

Various modifications in the width, thickness, and proportion of parts may be made in the adaptation of the improved building material to its various uses without departing from the spirit or sacrificing the advantages of my invention.

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

1. In the construction of walls, substantially as herein shown and described, the wall comprising two series of planks or boards laid upon or placed one against the other, and one series of boards having each of its individual members provided with a longitudinal channel on its inner face and the transverse grooves, and the parting-strips seated in the transverse grooves of the planks or boards and extending substantially at right angles to the length of the boards and to the longitudinal channels therein, as and for the purpose described.

2. In the construction of walls, substantially as herein shown and described, the wall comprising the two series of planks or boards placed one upon or against the other and each series having its individual boards provided on its inner face with a longitudinal central channel, which coincides with the similar channel in the fellow member or board of the other series, and the inner series of planks provided on its exposed surface with grooves or channels, the longitudinal partitions common to a number of planks of each series and extending through the dead-air spaces or cells formed by said two series of planks, and the parting-strips extending across the longitudinal dead-air cells on both sides of the longitudinal partitions therein, as and for the purpose described.

3. In the construction of walls, the boards or planks having the interior dead-air spaces, combined with the longitudinal partitions common to a series of boards and arranged centrally and longitudinally in the cells, and the transverse parting-strips, which divide the spaces into a multiplicity of isolated cells or narrow spaces, as set forth.

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

MARTIN S. MILLARD.

Witnesses:

E. F. PAGETTE,
JOHN PORTER.