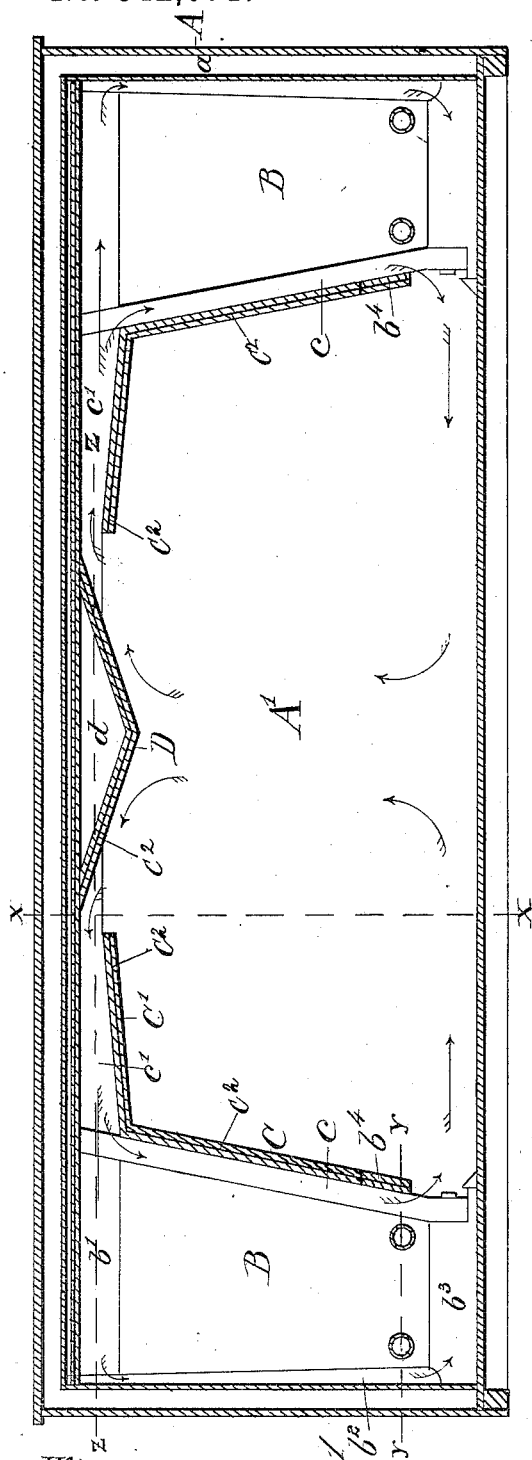


M. CUDAHY.  
REFRIGERATOR CAR.

No. 342,071.

Patented May 18, 1886.



Witnesses  
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Fig. 1

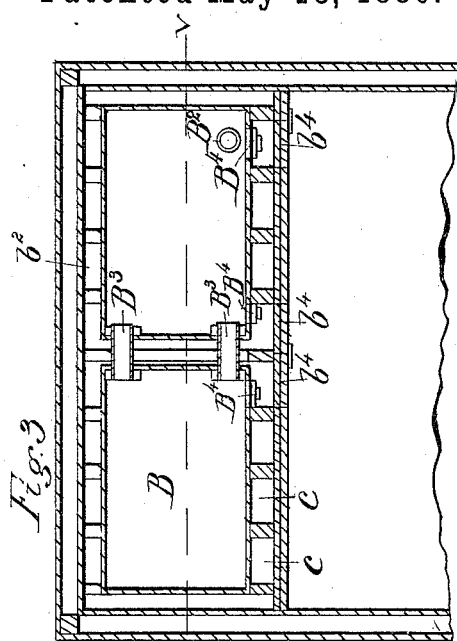


Fig. 3

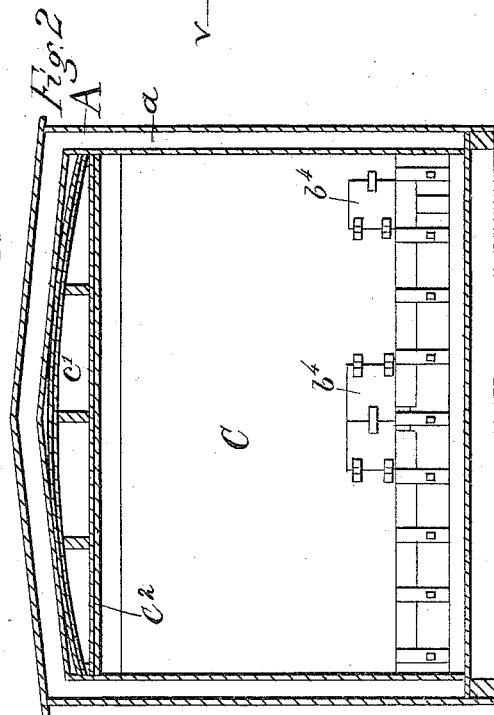


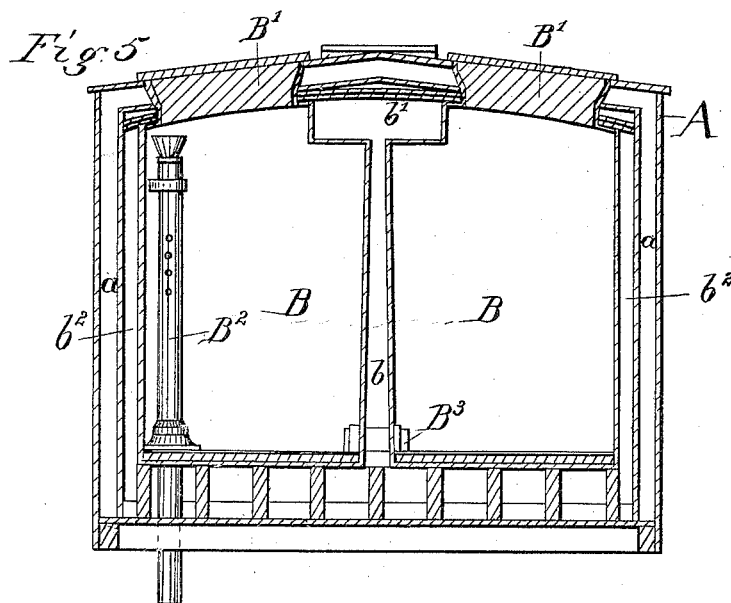
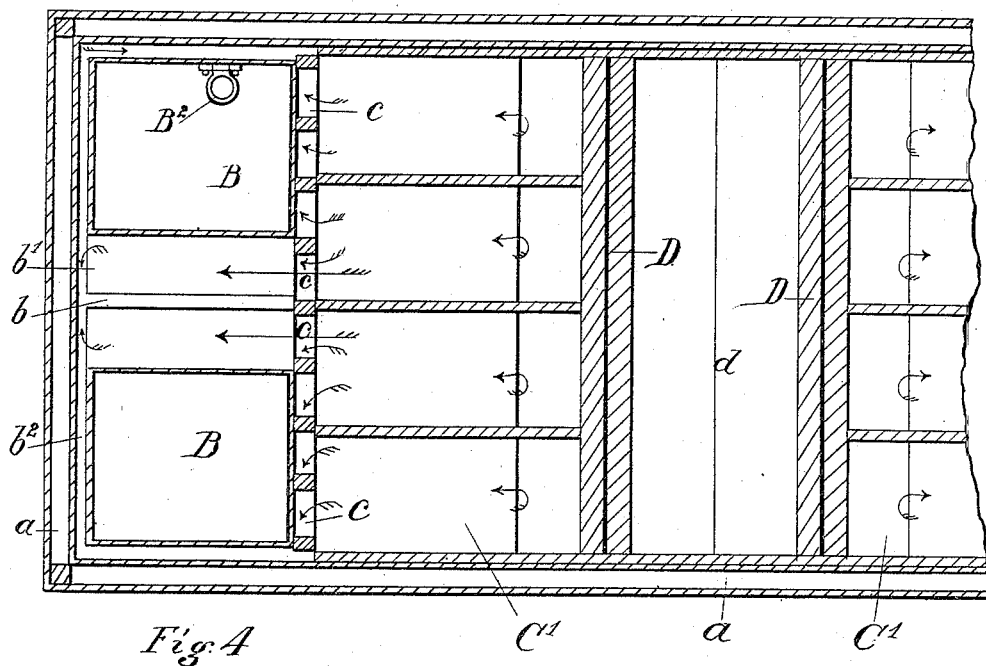
Fig. 2

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# UNITED STATES PATENT OFFICE.

MICHAEL CUDAHY, OF CHICAGO, ILLINOIS.

## REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 342,071, dated May 18, 1886.

Application filed October 22, 1885. Serial No. 180,670. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL CUDAHY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Refrigerator-Cars, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a central longitudinal sectional view of a refrigerator-car embodying my invention; Fig. 2, a transverse sectional view of the same, taken on the line *x x* of Fig. 1; Fig. 3, a detail plan section taken on the line *y y* of Fig. 1; Fig. 4, a detail plan section taken on the line *z z* of Fig. 1, and Fig. 5 a transverse section taken on the line *v v* of Fig. 3.

Like letters refer to like parts in all the figures of the drawings.

My invention relates to refrigerator-cars or other receptacles for storage or transport, its object being to produce a structure wherein a low temperature may be maintained, for the purposes of preserving the contents of the structure during storage or transportation; and to this end my invention consists in certain novel features, which I will now proceed to describe, and will then specifically point out in the claims.

In the drawings, in which I have shown my invention practically carried out in one form, A represents a car-body of suitable construction. This car-body is double, being provided with a suitable protective air-space, *a*, to prevent the external heat from being too readily communicated to the interior of the car.

The walls are constructed of any approved non-conducting material or combination of the same.

At each end of the car is arranged a pair of tanks, B, in which the ice for cooling the interior of the car is placed. These tanks are clear of the body of the car, being surrounded on all sides by air-spaces, so as to allow the air in the car to circulate around them freely, as hereinafter described.

Between each pair of tanks is an air-space, *b*, which is enlarged at the top into a flue or air-passage, *b'*, for the purposes hereinafter described.

Suitable openings or man-holes, B', provided with covers for closing the same, are formed

in the top of the car, and communicate with the interior of the tanks, so that these latter may be readily filled with ice when desired.

Between the main or storage space A' of the car and each pair of tanks is arranged a shield or partition, C. This shield extends entirely across the car, but not to the top or bottom thereof, and suitable air-spaces, *c*, are left at the rear face of the shield and the tanks B.

Each shield is provided at its upper edge with an extension, C', which is carried inward toward the center of the car, as shown in Fig. 1 of the drawings, leaving between the said extension and the ceiling of the car an air-space, *c'*. Owing to the curvature of the roof of the car this air-space is higher at the center than at the sides, its largest or central portion being in line with the air-passage *b'* and of substantially the same capacity as the said air-passage.

Between the inner ends of the extensions C' is arranged a deflector or guide, D, consisting of two shields attached to the ceiling of the car at a point nearly above the inner ends of the extensions C', and extending downward and inward, as shown in Fig. 1, until they meet at the center of the car, forming within them a dead-air space, *d*.

The operation of this construction is as follows: The air in the central air-space, A', on becoming somewhat heated, will rise to the top of the car, where it is deflected by means of the deflector D into the air flues or passages *c'* above the extensions C' of the shields C. The air passes along these flues *c'*, a portion of it passing down the air-spaces *c*, between the shields C and tanks B. A large volume of the air passes, however, through the flue *b'*, and thence down through the space *b* between the tanks, and the spaces *b'* between the tanks and the end of the car. This heated air thus comes in contact with the surface of the tanks, and is thoroughly cooled, descending to the floor of the car, where it passes out again into the main air-space A. Air-spaces *b''*, underneath the tanks, permit the air from the space *b'* to pass underneath the tanks, and thence into the central space, A'. It will be seen that by this means a constant circulation of the air in the car is maintained, the air in the central space as it becomes heated being carried out and caused to flow around the ice-tanks until

sufficiently cooled, when it passes again into the central space.

The dead-air space *d*, within the deflector D, in conjunction with the air passages or flues *c'* and *b'*, forms an additional shield between the roof of the car and the central space, *A'*, by means of which the heat to which the roof of the car is generally subjected by the direct rays of the sun is prevented from affecting the interior of the car, and thus raising the temperature.

The shields or partitions C and their extensions *C'* are provided with a layer, *C<sup>2</sup>*, of suitable insulating material—such as hair, felt, or paper—or a combination of the same. This insulation prevents the cold air in the main space *A'* of the car from chilling the comparatively warm air in the air-passage *c'*, and thus checking its flow toward the tanks. It will be seen that the air-passages *c'* are thus completely insulated on all sides, so that the warm air cannot affect the cold air under these passages, nor the cold air affect the warm air in the passages.

It will be observed that the shields C are shown inclined toward the center of the car, the extensions *C'* being shown as inclined slightly upward at the same time. This arrangement of the shields and their extensions facilitates the circulation of the air, as hereinbefore described, having a tendency to guide the upward currents in the direction of the openings of the air-passages *c'* in an obvious manner.

Each pair of tanks B is provided with an overflow-pipe, *B<sup>2</sup>*, of suitable construction, the two tanks composing the pair being connected by means of pipes *B<sup>3</sup>*, to permit the waste water to flow freely from the one tank into the other, and thus reach the overflow-pipe.

Access to the connecting-pipes *B<sup>3</sup>* and overflow-pipe *B<sup>2</sup>* is obtained by means of man-holes or hand-holes *B<sup>4</sup>*, so that the same may be readily cleaned in case they are clogged by dirt or other obstructions.

Suitable traps or doors, *b<sup>4</sup>*, may be provided in the partitions C to permit ready access to the man-holes *B<sup>4</sup>*.

It is obvious that various modifications in the details of construction and arrangement may

be made without departing from the principle of my invention. For instance, although I have shown the tanks B as arranged in pairs at each end of the car, a single tank at each end may be substituted, or more than two tanks may be employed to compose each group.

The inclination of the shields C and extensions *C'* may be dispensed with, although I prefer to construct them in the manner shown.

Various other modifications will readily suggest themselves, and I therefore do not wish to be understood as limiting myself strictly to the precise details hereinbefore described and shown in the drawings.

I am aware of Letters Patent to Woolfolk, No. 269,771, granted December 26, 1882; of Letters Patent to Wight, No. 281,421, granted July 17, 1883, and of Letters Patent to Bayley, No. 276,952, granted May 1, 1883; and I therefore do not wish to be understood as claiming anything set forth in said Letters Patent.

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

1. In a refrigerator-car, the combination, with the ice-tanks B and the partitions C, having passages for the air-current above and below, of the extensions *C'*, extending from side to side of the car and forming the air-passages *c'*, and the deflector D, arranged between the extensions, substantially as and for the purposes specified.

2. In a refrigerator-car, the combination, with the ice-tanks B, of the inclined partitions C, and inclined extensions *C'*, and the deflector D, arranged between the ends of the extensions *C'*, substantially as and for the purposes specified.

3. In a refrigerator-car, the combination, with the ice-tanks B, having the air flues or passages *b'*, to permit the air to circulate to the back of the tanks, of the air-passages *c'*, having their central portion of a height substantially equal to that of the air-passages *b'*, substantially as and for the purposes specified.

MICHAEL CUDAHY.

Witnesses:

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ALISTER I. VALENTINE.