

(No Model.)

2 Sheets—Sheet 1.

J. T. GURNEY.

REFRIGERATOR.

No. 250,727.

Patented Dec. 13, 1881.

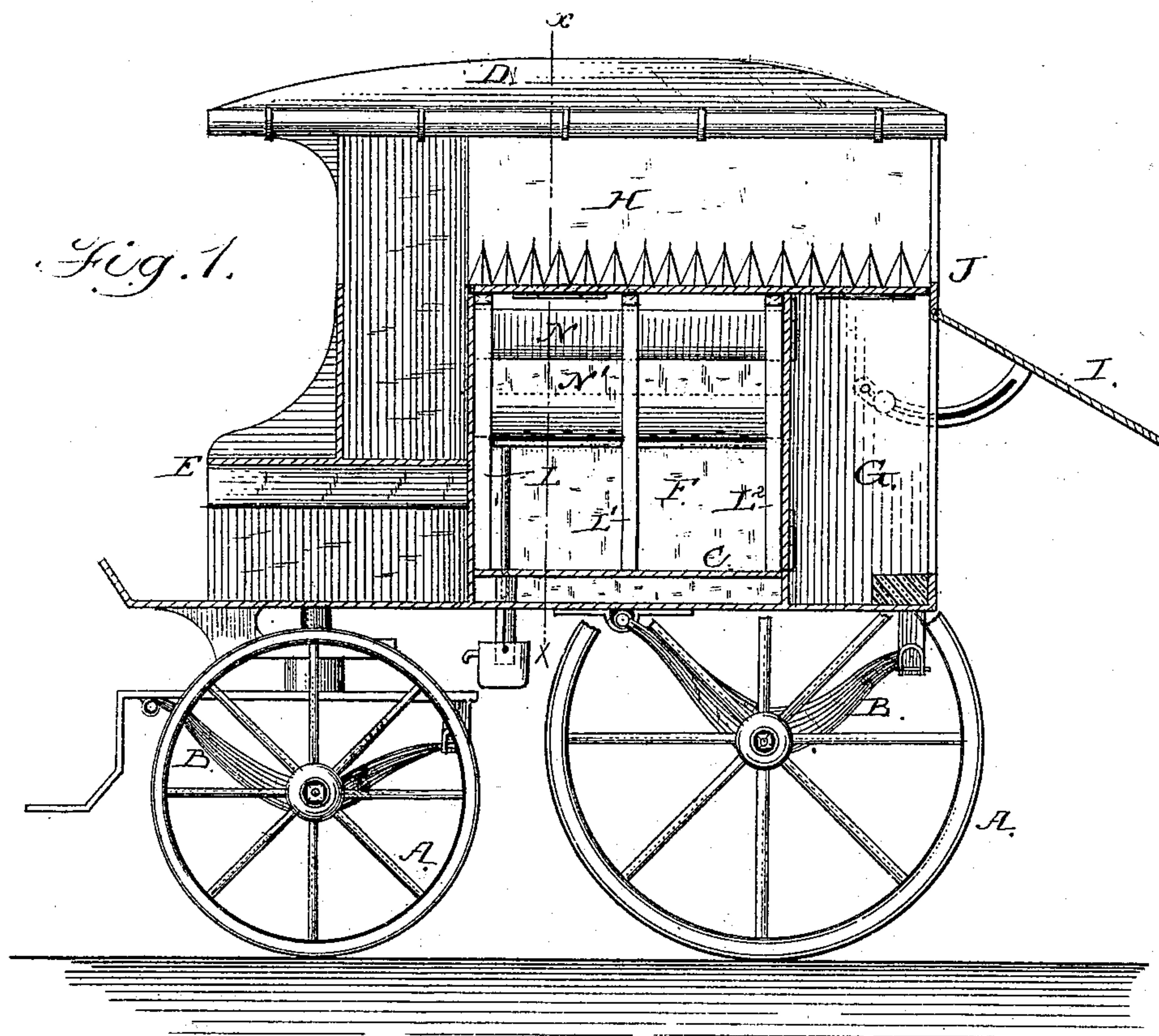
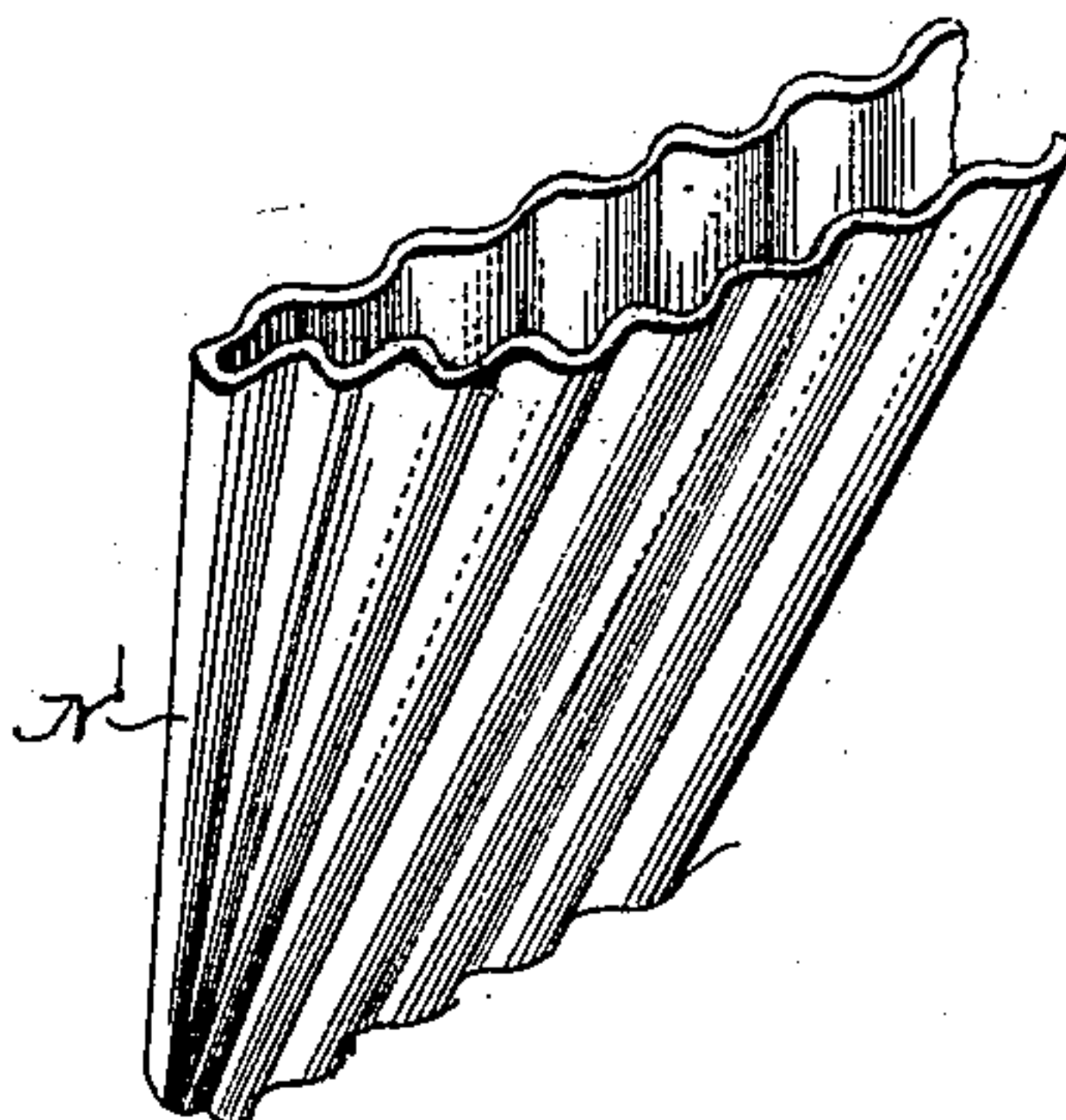


Fig. 6.



Witnesses;

J. Walter Fowler.
J. S. Barker.

Inventor;

J. Theodore Gurney
by Doubleday & Bliss
attys

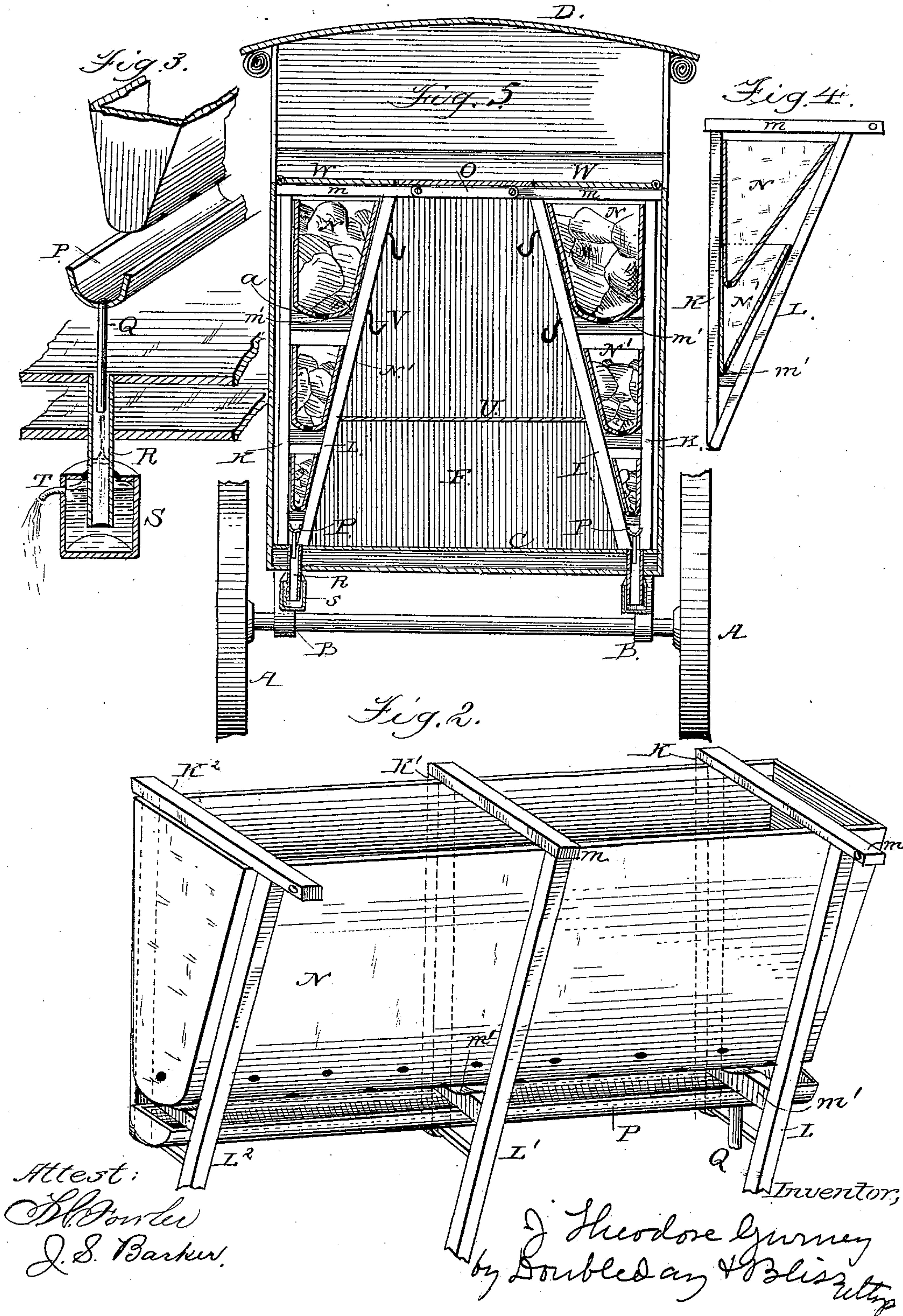
(No Model.)

2 Sheets—Sheet 2.

J. T. GURNEY.
REFRIGERATOR.

No. 250,727.

Patented Dec. 13, 1881.



UNITED STATES PATENT OFFICE.

J. THEODORE GURNEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO SAMUEL LITTLE, OF SAME PLACE.

REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 250,727, dated December 13, 1881.

Application filed July 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, J. THEODORE GURNEY, a citizen of the United States of America, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Refrigerators; 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a longitudinal section of a refrigerator-wagon embodying my improvements, this figure showing the means for supporting a series of refrigerant-receptacles, one above the other, arranged longitudinally of the refrigerating-chamber in the wagon, and also arranged so that one shall more or less overlap the other. Fig. 2 is a perspective of a tank and of a frame-work which can be arranged within the refrigerating-chamber to support a single ice-tank or refrigerant-receptacle. Fig. 3 illustrates, in perspective, the devices for withdrawing the water of thawing from the refrigerant-receptacle, and also from the bottom of the wagon. Fig. 4 is a sectional view showing the relative positions of two overlapping ice-receptacles, such as shown in side elevation in Fig. 1. Fig. 5 is a cross-section of the wagon, taken on line *xx* of Fig. 1, and shows also a series of three ice-tanks arranged one above the other. Fig. 6 illustrates a corrugated tank.

The invention relates to the construction of refrigerator-vehicles, such as are used in the transportation of perishable articles, which latter should be kept at a temperature below that of the open air; the invention relating more particularly to improvements upon the refrigerator-wagon shown in my Patent No. 242,125, May 31, 1881.

The general construction of the wagon proper is substantially similar to that shown and described in said patent; but I have found that for some purposes it is very desirable to so arrange the ice-tanks or refrigerant-receptacles within the refrigerating-chamber that they can be readily removed at any moment, either for

cleansing the wagon or for storing therein articles which may not require the process of refrigerating. I have found, also, that the best refrigerating effects cannot, under all circumstances, be so well attained by means of the ordinary ice-tank shown and described in said patent as they can by the construction and arrangement of the receptacles herein set forth.

In the drawings, A A represent the wheels of the wagon; B B, the springs; C, the bottom or bed; D, the top, and E the seat of the wagon, these parts being substantially similar to the corresponding ones shown in my Patent No. 242,125.

Within the body of the wagon are formed the refrigerating-chamber F, the chamber or compartment G in rear of the refrigerating-chamber, and the compartment H above the refrigerator. Access can be had to the refrigerating-chamber through the rear chamber, G, by means of one or more hinged doors between the two chambers, and the rear chamber, G, can be closed by means of a swinging door, I.

J represents the deck between the upper compartment, H, and the refrigerating and the rear chambers, F and G. The perishable articles which are to be transported by the wagon and are to be preserved during transportation are placed within the chamber F, and also within this chamber are placed my improved devices for containing the refrigerants and the devices for supporting the refrigerant-receptacles.

K represents a vertical standard or brace situated in the front corner or chamber F.

K' K² are similar uprights or standards situated, respectively, in the middle and at the front end of said chamber.

L is an inclined brace at the front end of the chamber F. It is connected rigidly with the upright or standard, K by means of an upper cross-piece, *m*, and one or more lower cross-pieces, *m'*. These parts K, L, *m*, and *m'*, it will be seen, form a frame at the front end of chamber F. Similar frames are formed at the center and rear ends of the chamber, as shown at K' L' *m m'* and K² L² *m m'*. These frames are formed separately from and independently of the wagon, and are inserted therein when they are to be used. Within and by means of the frames thus constructed are supported the

ice-tanks or refrigerant-receptacles. In Fig. 1 two of these receptacles are shown at N N', they being preferably nearly triangular in cross-section, and being arranged to overlap each other—that is to say, the upper edge of the lower tank extending above the lower edge of the upper one. This latter feature, however, is not inseparable from the others, and a single ice-tank or refrigerant-receptacle may be supported in the manner described, as shown clearly in perspective in Fig. 2. When a single ice-tank is thus employed, the vertical standards K K' K² may be shorter and not extend to the bottom of the wagon, though under some circumstances the other construction is preferable. In Fig. 2 the ice-tank is represented as being supported directly upon the cross-pieces m'.

In Fig. 5 there is shown a method of supporting a series of refrigerant-tanks extending from the top to, or nearly to, the bottom of the refrigerating-chamber. The tanks in this case are supported in the frames substantially as illustrated in Fig. 2. Two sets of frames of the character described are respectively supported against the side walls of the refrigerating-chamber, and after being placed properly in position they are firmly braced and held there by means of two cross-braces, similar to that shown at O, one being placed at the front end of the frames and the other at the rear end. It will be readily understood that by means of these simple devices the ice-tanks and their frames can be instantly removed whenever necessary, the only process required being the unscrewing of the front and rear cross-braces O and the sliding out of the tank-frames. When the tanks and their frames have been removed, the chamber previously used for refrigerating may be employed for storing and transporting articles of any character.

P represents a drip-pan situated beneath the ice-tank, and adapted to catch the water which results from the thawing of the ice. This drip pan or pipe is preferably inclined a little toward the front end of the chamber, and at that end it delivers whatever water it may contain to a pipe, Q, which extends downwardly and has its lower end within another larger pipe, R, which is attached to the bottom of the wagon. The last said pipe R extends to a suitable distance below the bed of the wagon and passes into and is surrounded by a small cup or bucket, S, the pipe passing nearly to the bottom thereof. The escape-orifice T from the cup or bucket is situated as close as possible to the top thereof. The water from the ice-tanks passes through the pipe Q to the bucket S, and the water which may be deposited on the bed of the wagon passes downward through the pipe R. This last said water, under some circumstances, may result from the condensation of moisture and the gases within the refrigerating-chamber F; but, when properly constructed and arranged, my improved refrigerant-receptacles entirely pre-

vent this condensation of moisture outside of said receptacles. The water in the cup or bucket S is always above the lower end of pipe R, and therefore no air can pass backward or upward into the refrigerating-chamber nor into the tanks.

The articles that are to be preserved and transported are placed within the chamber F, either upon the floor thereof or upon transverse shelves or platforms U, or upon hooks V, or supported in any other suitable manner. The air, which is warm and is charged with moisture and deleterious matter, and also the deleterious gases, rise upwardly from the lower part of the refrigerating-chamber, or from the vicinity of the articles therein, and pass into the tanks. Here the air is cooled and the moisture is absorbed, and with the moisture are deposited the foreign matters and deleterious gases. The water which contains these foreign materials passes downward until it reaches the pipe Q, and through that passes out from the refrigerating-chamber. The air, which has been cooled and cleansed, passes from the bottom of the tank outward into the refrigerating-chamber again.

By using two or more tanks, arranged as shown in Fig. 5, results can be accomplished additional to those mentioned above. Thus the air which is the least charged with moisture, and the deleterious gases which are the lightest, will rise to the upper refrigerator-tank, and will there be operated upon, as above described, while the air which is more heavily charged with moisture and the denser gases can pass into the lower refrigerator-tanks and be there subjected to similar processes. These heavier gases and the denser moisture have heretofore, in refrigerators as commonly constructed, not been successfully dealt with, and they have a tendency to remain in the lower part of the refrigerating-chamber and stay in the vicinity of the articles from which it is necessary to remove them.

Still other advantages are attainable by an arrangement of the tanks similar to that shown in Figs. 1 and 4. In this case the air is compelled to pass through the whole series of tanks, and is prevented from escaping until it has been subjected to the greatest purifying and cooling action possible.

When devices of this character are employed there is none of the condensation upon the walls of the tank or the walls of the refrigerating-chamber or the articles therein so commonly experienced in other refrigerators.

The vertical or rear standards, K K' K², rest against, or nearly against, the side walls of the refrigerating-chamber, and therefore there is an ample space allowed behind the rear wall of the ice-tank for the upward passage of air, a free circulation of air around the tank thus being insured.

By means of doors W W in the deck J access may be had to the upper ice-tanks after they have been placed in position, and access

may be had to the lower ones through the chamber F; or, if preferred, the openings *a* in the upper tanks may be made large enough to allow smaller pieces of ice to be passed through them to the tanks below, but not so small as to permit the passage of larger pieces, which can be retained in the upper tanks; or the bottoms of the upper tanks may be left entirely open until the lower tanks are filled, after which gratings may be placed in the bottoms of the upper tanks to support the ice therein.

In this case I do not claim any other features than those specifically set forth in the following claims, as I propose to make all other patentable features the subject-matter of another application, which I am about to file as a division of this case.

In Fig. 6 a portion of an ice-tank is shown to be constructed of corrugated sheet metal, the corrugations operating in a way now well known to permit a freer passage of the air through the tank.

In constructing any of the tanks any suitable material may be employed, though I prefer galvanized iron.

I am aware that detachable ice-tanks have been supported in refrigerators by plates and frames of various constructions, and also aware that such tanks have been made of corrugated metal, and I do not claim these matters as my invention.

What I claim is—

1. In a refrigerator-wagon, the refrigerator-chamber having a door in the rear end, a chamber in the rear of the refrigerator-chamber, the detachable tank-frames adapted to be passed through said door into the refrigerator-chamber, and provided with inwardly-projecting arms or cross-pieces, and detachable fastening devices, which connect said inwardly-projecting arms, substantially as set forth.

2. The combination, with the ice-tanks, of the detachable frames composed of the uprights, the inclined braces, the cross-pieces extending inwardly from the tanks, and the detachable fastening devices for connecting the tank-frames.

3. In a refrigerator-wagon, the combination, with the ice-tank and the detachable tank-frames constructed of the uprights, the inclined braces, and the cross-pieces *m* and *m'*, of the cross-brace *O*, arranged substantially as described, to brace one tank-frame against a corresponding opposite frame, as set forth.

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

J. THEODORE GURNEY.

Witnesses:

HENRY H. PAGE,
SETH WHITTIER.