(No Model.) 4 Sheets—Sheet 1.

# F. S. EASTMAN.

## REFRIGERATOR CAR.

No. 257,216. Patented May 2, 1882.

Fig. 1.

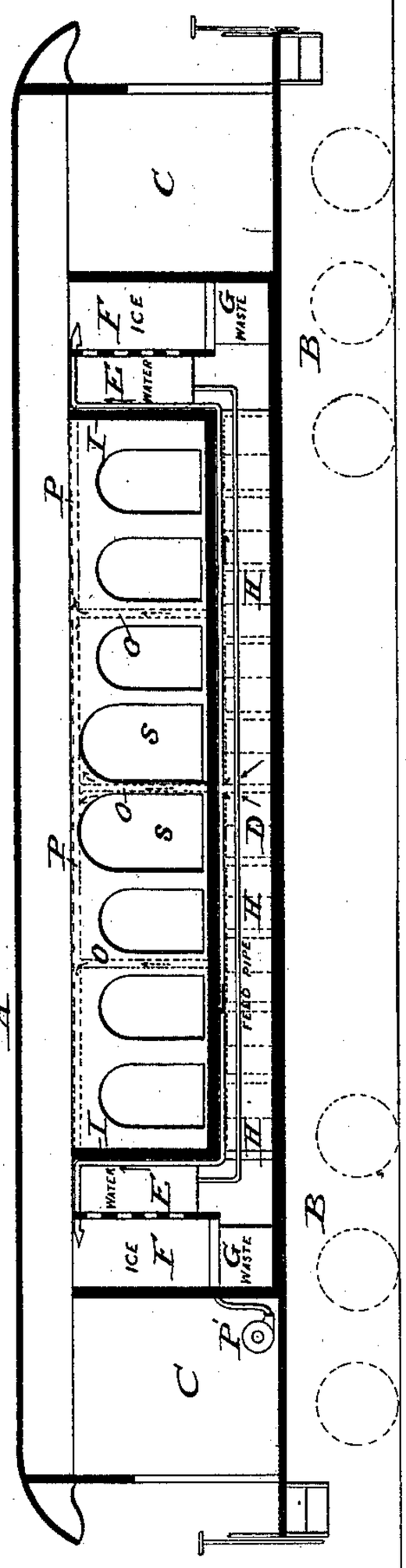
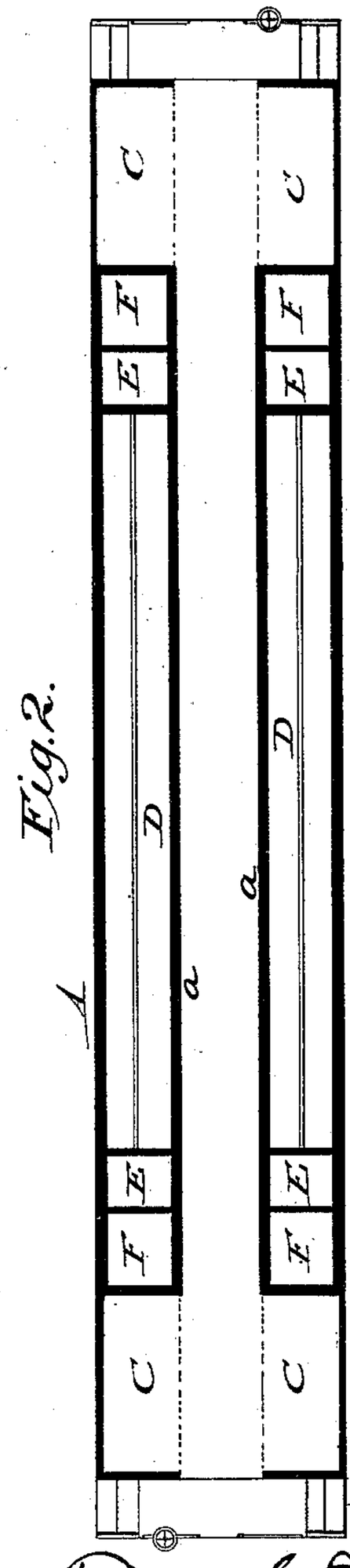



Fig. 2.




Attest.

Sidney P. Hollingsworth

Walter S. Dodge.

Inventor.

Frank S. Eastman,

by Dodges Son,

Attys.

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.)

4 Sheets—Sheet 2.

# F. S. EASTMAN.

## REFRIGERATOR CAR.

No. 257,216. Patented May 2, 1882.

Fig. 3.

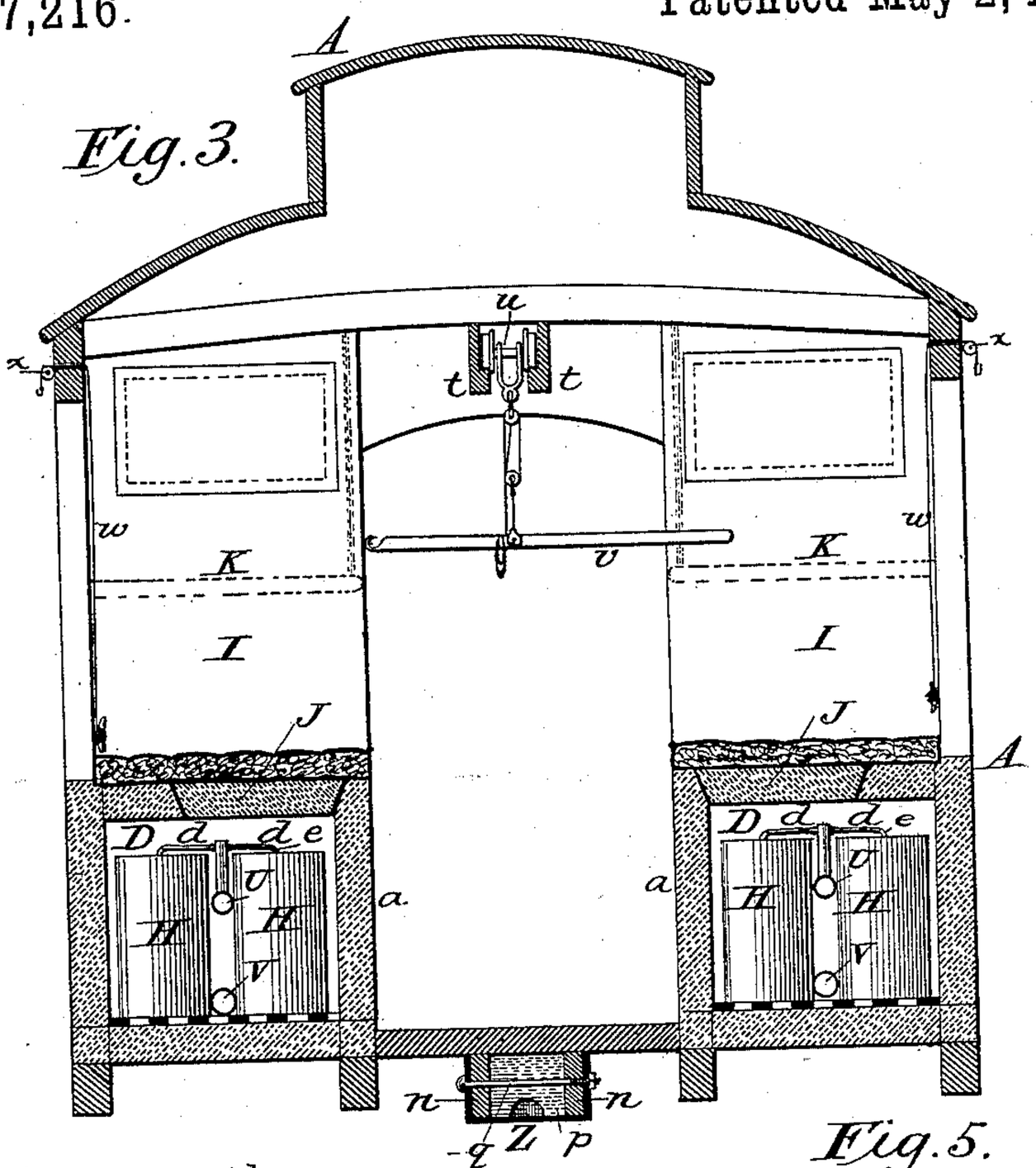
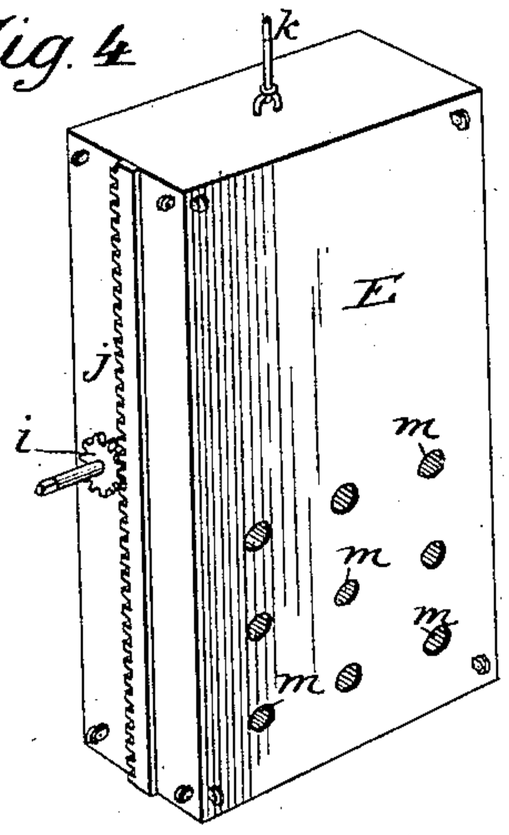
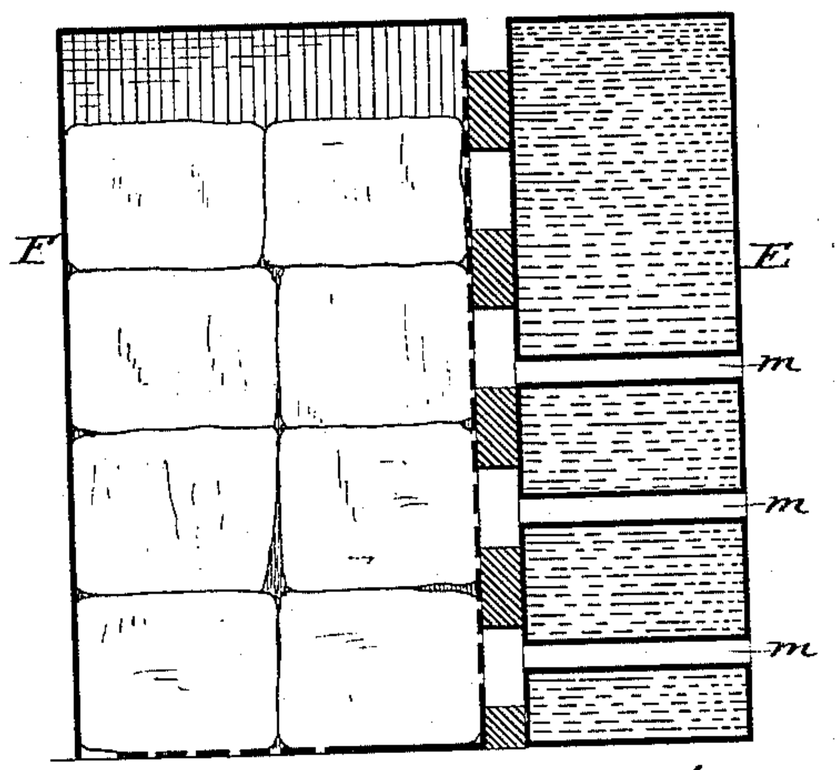
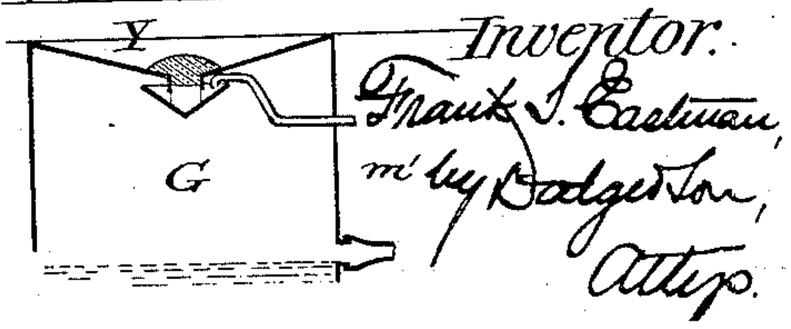



Fig. 5.

Fig. 4

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(No Model.)

4 Sheets—Sheet 3.

# F. S. EASTMAN.

## REFRIGERATOR CAR.

No. 257,216. Patented May 2, 1882.

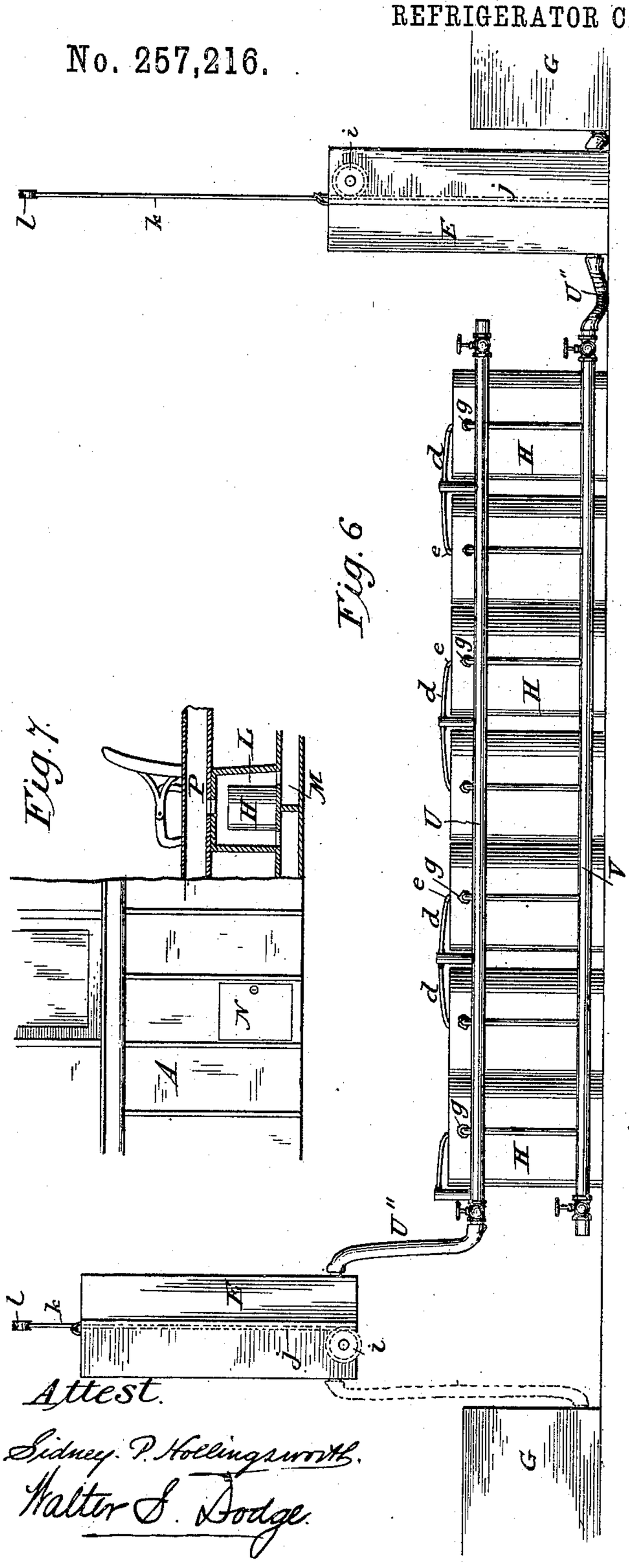


Fig. 6.

Fig. 7.

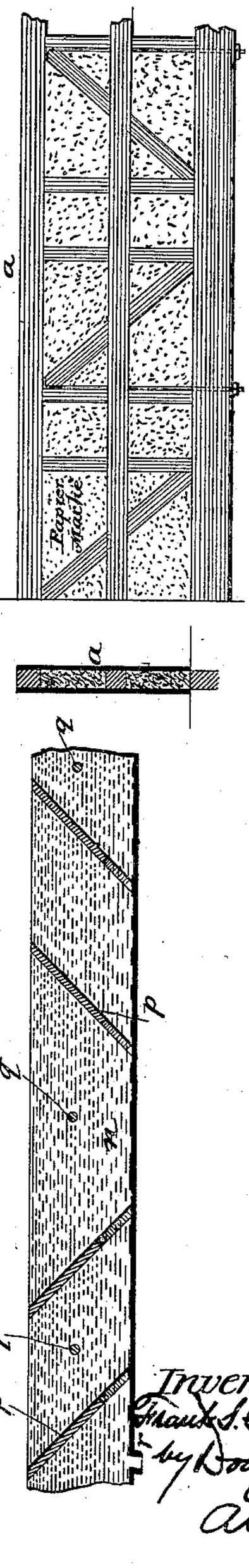


Fig. 9.




Fig. 8.

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(No Model.) 4 Sheets—Sheet 4.

# F. S. EASTMAN.

## REFRIGERATOR CAR.

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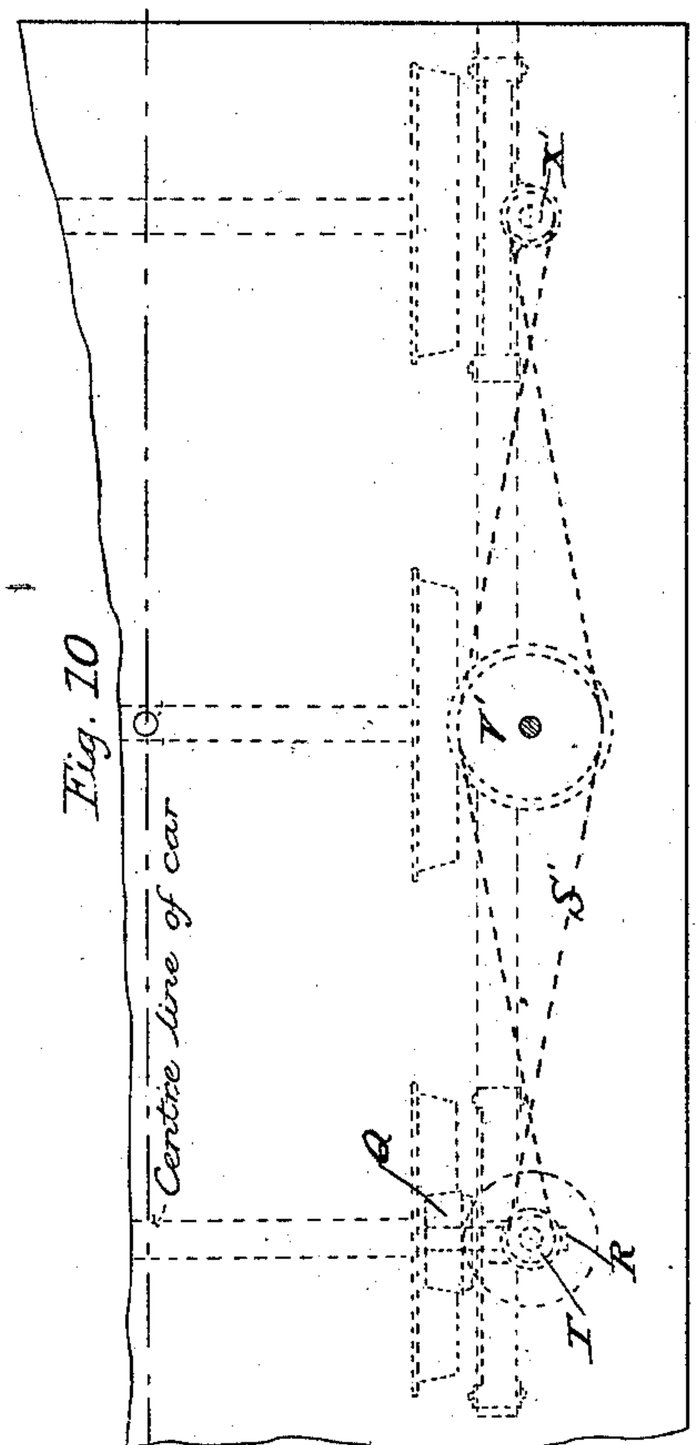


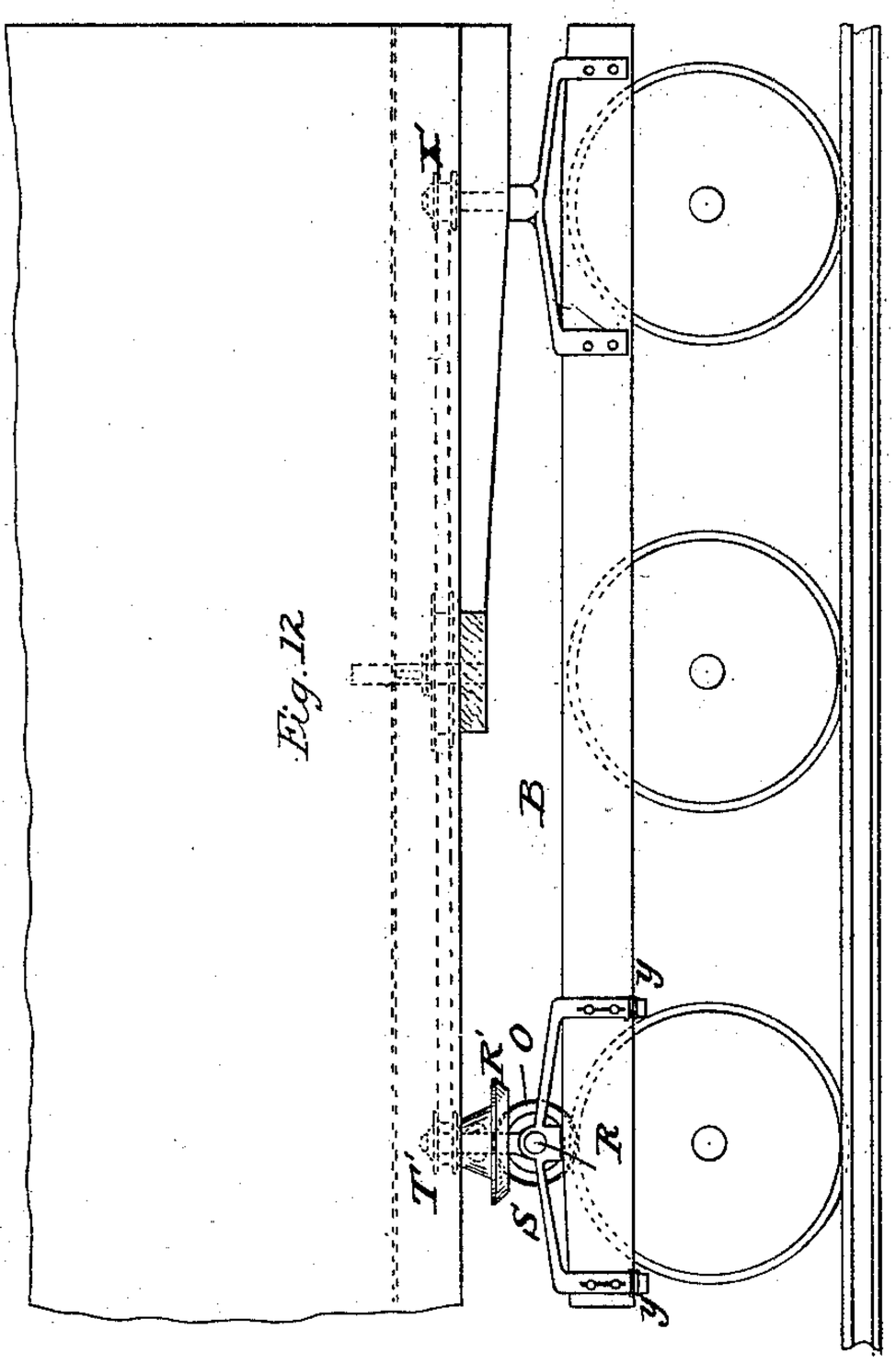


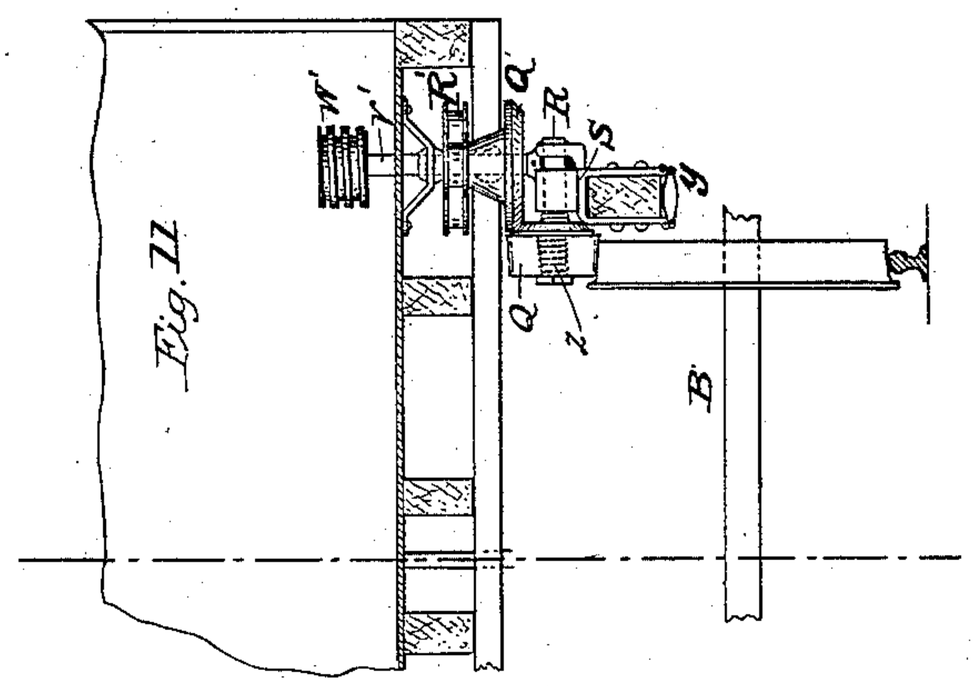


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# UNITED STATES PATENT OFFICE.

FRANK S. EASTMAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

## REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 257,216, dated May 2, 1882.

Application filed March 7, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK S. EASTMAN, of Washington, in the District of Columbia, have invented certain Improvements in Refrigerator-Cars, of which the following is a specification.

My invention relates to cars for the transportation of perishable matters, and particularly such matters as require care and attention during shipment.

The invention consists in various features and details of construction, hereinafter fully set forth, prominent among which may be mentioned a novel arrangement of the cooling-chambers, whereby the weight of the load carried therein is brought down low, and the car thereby adapted to travel at a high rate of speed, and whereby, also, great economy of space is afforded, together with a saving in ice and the securing of a lower temperature than has generally been found practicable heretofore.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section through my improved car, showing the general arrangement of the interior; Fig. 2, a horizontal longitudinal section of the same; Fig. 3, a vertical transverse section; Fig. 4, a perspective view of the water-tank and its elevating and sustaining mechanism; Fig. 5, a vertical section through the ice and water chambers, showing also the drip or waste pan; Fig. 6, a view showing the arrangement of water tanks and pipes for securing circulation of the water where the same is required for preservation of matters carried; Fig. 7, an outside view of the car, partly in section, showing the invention applied to an ordinary passenger-car and the outside doors for removing articles from the cooling-chambers or interior of the car; Fig. 8, a sectional view of a supplemental water-tank beneath the car; Fig. 9, a view showing the inner trussed wall of the cooling-chamber; Figs. 10, 11, and 12, detail views of a friction driving-gear employed for operating a fan or other mechanism.

Hitherto, in the construction of cars for the transportation of perishable goods requiring refrigeration or cooling, it has generally been the custom to cool the whole interior of the car, the ice-chamber being placed in the top of the car and the cold air allowed or caused to descend and fill the interior.

The location of the ice-chamber in the roof or top of the car, and the consequent weight above the line of load, has rendered the cars top-heavy, preventing their traveling at high rates of speed, and causing the car to be racked and strained severely when traveling even at freight-rate of speed. The necessity of cooling the whole interior space of the car has also required the carrying of a large amount of ice, and since the aggregate weight of load is limited by the rules of all railway companies, it follows that just in proportion as the quantity of ice is increased the cargo of goods must be diminished. It is therefore important to reduce the quantity of ice to the lowest limit consistent with thorough and efficient refrigeration, and in doing this I effect a great saving by adapting the size of my cooling-chambers to the cargo to be carried therein, thus rendering it necessary to cool only the space actually necessary for the reception of such cargo. I further limit the quantity of ice required by a peculiar arrangement of air-conduits by which I effect a constant and perfect circulation of air.

The car which I have represented in the drawings, and which I shall proceed to describe, is especially designed for the transportation of live fish, which require to be kept cool, to be constantly supplied with fresh air, and to have a change of water either at intervals or by a constant and gradual flow or change; but I wish it distinctly understood that the invention is not confined to cars for this purpose.

Other details of the invention will be fully described in connection with the features above mentioned.

Referring now to the drawings, A represents the car, carried by suitable trucks, B, and of essentially the same construction as passenger-cars of the better class now in use, though the general construction may be varied according to the particular requirements of each case.

At each end of the car is a section, C, fitted and furnished for the convenience of officials or others connected with the service. These sections may be fitted up in any convenient

style or manner with desks or secretary for clerical work, berths for sleeping, or in whatever manner may be required. By preference, one section will be fitted up as an office-room and the other as a sleeping-apartment.

The space between the two compartments or sections C contains the cooling-chambers D, which in the present case are located at the sides of the car and extend from one compartment C to the other, the water-tank E, ice-box F, and waste-tanks G being at the ends of the cooling-chambers and next to the compartments C. The cooling-chambers are of a height sufficient only to freely receive the matters to be refrigerated, or the vessels H, in which the fish are carried when the car is designed especially for that purpose, and to afford proper space for the free circulation of air about them. The sides, top, and bottom of the chambers D are formed or provided with non-conducting material, and of proper thickness to prevent the outside air from affecting the temperature within said chambers; but it will be seen that under my construction I am required only to extend the non-conducting walls slightly above the cans or vessels H, instead of carrying them to and across the top of the car. By this change I not only lessen the cost of construction, but I also materially decrease the weight of the car, and wholly dispense with the weight above the line of load, which has been so great an objection under former constructions. As the weight of the car is thus decreased provision is made for the increased weight of the cargo without raising the aggregate weight of the car-load, and as the weight of the cargo is thus materially increased, and as the lowering of the load close to the trucks renders feasible a high rate of speed, it becomes important to stiffen and strengthen the car to adapt it to such accelerated speed, and for this purpose I construct the inner walls, *a*, of chamber D each in the form of a truss, as indicated in Fig. 9, the ends of the truss abutting against the ends of the framing or timbers of the tank and ice-box chamber I. In this way the truss is made to serve both as a truss and as a wall for the chamber, affording the necessary strength and the thickness required to render it thoroughly non-conducting, and this without occupying any additional space in the car.

To render the walls and the top and bottom of the cooling-chamber D thoroughly non-conducting, and to prevent the possible formation of crevices or openings by the racking and wrenching of the timbers which necessarily occur, I preferably fill in the open spaces of said walls, top and bottom, with papier-maché in a fluid state, subjecting the same to pressure, if required, to force it into all the small crevices and openings of the wood-work or framing. When this material sets it becomes tough and hard, does not swell or shrink, and is not liable to crack or open, besides materially adding to the strength of the truss. It is therefore admirably adapted to the purpose stated.

The chambers D may be connected or not, as preferred.

The arrangement of the cooling-chambers as above leaves the interior of the car free and open for such use as may be required, and wholly unaffected by the cool air of the chambers. It is therefore admirably adapted for use as a compartment for the attendants having charge of the cargo, and will ordinarily be furnished with berths hung from the walls or the roof and adapted to fold up out of the way when not in use, and with conveniences for cooking, &c.—in other words, the car will be adapted not only for carrying the perishable matters in properly-cooled chambers, but also to carry officials, attendants, or general passengers in an ordinary atmosphere, thus overcoming a most important objection existing to the cars in use, in which the attendants were necessarily subjected to the cool air—a fault which experience shows has occasioned much sickness and injury to attendants.

In order that the attendants may properly examine and see to the fish or other cargo in the chambers D, the top of each chamber is furnished with a series of doors, J, each of sufficient size only to permit the convenient entrance or removal of one of the vessels H, which will ordinarily be arranged in two rows from end to end of the chamber, and preferably in groups of four, as indicated.

The doors J are formed with beveled sides, and suitably packed with rubber or other elastic or flexible material which will secure an air-tight joint.

The doors being at the top of the chamber, and the cool air naturally seeking a low level, it will be seen that the doors may be opened without permitting any considerable escape of cold air or any appreciable entrance of warm air. Hence the great waste of cold air in cars now in use by opening large doors at the side of the car for the entrance of an attendant is avoided, and the necessity of restoring a large volume of cold air is obviated.

The upper side of doors J will be upholstered and adapted for use as seats, thus rendering the car convenient for attendants or passengers, without further cost for chairs, though, if desired, a row of pivotal chairs, such as used in chair-cars, may be arranged in the aisle, and the chambers D may be formed with offsets to permit a more ready passage through the car and by the chairs.

K represents one of a series of berths above the seats.

In many cases, and for the transportation of matters requiring merely to be kept cool, the invention may be embodied in ordinary passenger and sleeping cars, suitable chambers, L, being formed under the seats, as indicated in Fig. 7, each communicating with a cold-air passage, M, formed beneath the floor of the car, by boarding or closing up the lower side of the space between the sills, as shown. In order to permit the removal of the contents of these chambers expeditiously, and without in

any way disturbing the passengers, doors or openings N are formed in the wall of the car opposite each chamber, as shown in Fig. 7, through which the vessel containing these matters, or the matters themselves, may be withdrawn.

The doors will be suitably constructed to render them air-tight, and the walls of the chambers and of the air-duct will ordinarily be rendered non-conducting.

By the construction thus explained passenger-cars may be made to carry light perishable articles—such as fruits, oysters, and other delicacies, now unobtainable in many sections of the country—to any desired point with expedition and dispatch, thus avoiding the delay of freight transportation and the danger or loss from being carried in express-cars not provided with proper means for keeping them cool. This being incidental, and in addition to the usual load of passenger-cars, may be carried at a trifling expense and yet add to the revenues of the road, because it enables a class of goods to be transported successfully which hitherto it was considered impracticable to ship at paying rates.

Having described the general arrangement of the car, I will proceed to explain the details of the apparatus for effecting the refrigeration of the chambers D, and I would here remark that the cooled air may be caused to circulate by a fan or in accordance with the laws governing air-currents independently of a fan.

It being well known that cold air falls to the lowest attainable level, I place the ice-box F at a higher level than the chambers D, and thereby cause the cool air to fall to and fill said chambers naturally and without mechanical assistance. As the cool air travels through the chambers D and passes farther away from the ice it becomes gradually warmer, and has consequently a tendency to rise.

At the end of the cooling-chamber D, or at suitable points in the length and at the upper side thereof, I place upright pipes O, all communicating at their upper ends with a common air pipe or duct, P, by which the air escaping from the chamber D is carried back to the ice-box F, which it enters at the top, to be recooled and again supplied to the chambers D. This arrangement is advantageous because of its simplicity, and for the reason that the circulation continues whether the car be in motion or not.

The pipes O may be carried in the walls or boxed up to prevent the air from becoming sufficiently warm to melt the ice when entering the chamber. By passing through the ice-box the air is purified as well as cooled and all deleterious odors and gases removed. In some cases, however, especially where a very low temperature is required, a fan or blower, P′, will be employed, and this will be driven from one of the car's truck-wheels through a friction-wheel, Q. In order that the relative movements of the truck and car-body, either in turning curves or rising and falling, may not interfere with or disarrange the friction-gear, I arrange the same as shown in Figs. 10, 11, and 12, in which it will be seen that the friction-wheel shaft R is carried by a yoke or standard, S, straddling the stringer of the truck, and secured thereto by bolts passing through the slotted legs or arms of said standard, whereby a vertical movement of the same is permitted, springs *y* serving to hold the standard normally down upon the stringer, as shown.

The wheel Q slides upon the shaft R, but is prevented by a spline or feather from turning thereon. Springs *z* bear against its opposite faces, by which means a proper end-play of the wheel is secured to compensate for the play of the truck-axles.

The friction-wheel Q is formed with two friction or bearing surfaces, one to rest upon the tread of the truck-wheel and the other forming a bearing-face for a horizontal friction wheel or disk, Q′, carried upon the yoke or standard S, and provided on its upper side with a spool or pulley, R′.

The standard S and its fittings are placed over the center of either the front or rear axle of the truck, and a belt, S′, is carried about a pulley or spool, T′, on opposite sides of a like spool or pulley, U′, on a shaft, V′, carried in bearings made fast to the car-body, and provided with a worm or pulley, W′, and finally about a third spool or pulley, X′, the shaft of which is mounted upon the truck-stringer, over the axle farthest from that over which the friction-wheel is placed. From the worm-wheel motion is imparted either direct or through suitable gearing or belts to the fan P. It will be seen that by this arrangement the truck is permitted to turn, rise, or fall without interfering with or endangering the friction-gear. A lever will be provided for establishing or relieving the contact of friction-wheel Q with the truck-wheel.

I am aware that friction-wheels have been used for the purpose herein set forth; but in every case, so far as I know, a special wheel has been secured upon the axle of the truck-wheels, and motion transmitted by belting from the friction-wheel. Such construction and arrangement are objectionable, because in the event of injury to the truck-wheels a pulley must be secured upon the axles of the wheels substituted therefor, and because, also, it is impracticable to compensate for the stretching of the belts by reason of the movement of the truck in turning curves, and, finally, because the belts are liable, as heretofore arranged, to slide off and cause trouble and damage. By my plan all these difficulties are avoided.

The fan, an air-pump, or equivalent means, will be used in all cases where live fish are transported, and a special pipe will be carried therefrom to each of the cans or vessels to produce air-bubbles in the water, which are found almost if not absolutely essential in the practical transportation of live fish. In order to keep up the supply of air for this purpose when

the car is at rest, the fan or pump may be operated by hand, or a tank, X, containing compressed air, may be employed and provided with means for connecting with the vessels or cans.

The ice-boxes are arranged one on each side of the car and at each end of the chambers D, as shown in Fig. 2, and by preference they are all connected by air-pipes *b*, or only those at one end may be connected.

T represents the water-tanks employed when transporting live fish, &c., requiring water, of which four are employed, preferably placed, as shown in Figs. 1 and 2, just in front of the ice-boxes, an open grating, *c*, being interposed between the box and tank, through which cold air may circulate to cool the water in the tanks. The bottom of each tank is above the top of the cans or vessels H, so that the water will flow to them by its own gravity, a pipe, U, connecting with the lower end of each tank and passing thence between the cans or vessels from end to end of the chamber.

The pipes U are each furnished with an upright branch, from which four flexible tubes, *d*, are carried to nipples *e* on the tops or covers of the cans or vessels of each group, the tubes being furnished with suitable couplings for ready attachment or detachment, as may be required. Each can or vessel is also connected by a similar flexible tube and coupling, *g*, with a waste or overflow pipe, V, opening into a chamber or waste-tank, G, beneath the ice-chamber, said tank being furnished with a trapped or sealed escape-pipe, *h*, as shown.

As the quantity of water which may be conveniently carried is limited, and as an increase in the weight of water necessitates a decrease in the weight of cargo, I propose to use the same water over and over, which may be successfully done a number of times. For the more convenient carrying out of this object, I first allow the water to flow from one tank at the end of each chamber D through the pipes and into the waste-tank at the other end. I then lower the empty water-tank and connect the waste-pipe therewith, at the same time making connection between the water-tank at the opposite end and the supply-pipe U, by which means the water from the full tank is caused to flow into the cans and to be discharged into the empty tank at the opposite end. Flexible sections U″ are provided for making such connections. When the water is thus transferred from one to the other tank the empty one is lowered and the full one is elevated, the proper connections made, and the action repeated. In this way by the expenditure of a few minutes of labor the water is caused to flow without the aid of pumps or other circulating apparatus.

For the purpose of lowering and raising the tanks, I prefer to employ a rack and pinion, *i j*, as shown in Figs. 4 and 6, a pawl being arranged to engage with the pinion, or other means being provided to retain the tank at the proper elevation, as indicated.

Anti-friction rollers may be applied to the tanks to prevent their binding or rubbing in rising and falling.

In practice I prefer to connect the two tanks at the same end of the car by ropes or cables *k*, passing over pulleys *l*, so that as one rises the other will fall. In this way the weight of the tanks themselves will be counterbalanced, leaving only the weight of the water to be lifted.

In order to more rapidly cool the water, the tanks are preferably formed with tubular passages *m*, through which the air may circulate, as indicated. A further supply of water is afforded by the melting of the ice, a pan or collector, Y, being placed beneath the grated bottom thereof to collect such water, and a special pipe, *m*, being provided to conduct the water to the cans or vessels. A filter will be placed over or in the outlet of the drip-pan, and the outlet will be trapped to prevent any air from entering the ice-chamber from the water-tank when the waste-pan is not connected with the pipe mentioned. In making long trips, however, the combined supply from the tanks and the ice-boxes will sometimes be insufficient, and as the car is designed to travel in passenger and express trains, which cannot be expected to stop for the purpose of taking in a new supply, it becomes important to provide a still further supply, for which purpose I construct a supplemental tank, Z, between the sills *n* under the car. The construction of this tank will be understood by referring to Fig. 8, in which it will be seen that a series of grooves or rabbets are formed in the inside faces of the sills, in which are seated the ends of cross-boards *p*, set at an inclination to the length of the sills, the whole being enveloped by galvanized sheet-iron or other metal, and bound together by transverse bolts *q*, as shown. Being thus strongly braced and trussed, the sills may be made enough lighter than usual to compensate for the weight of the cross-pieces *p*.

The tanks are closed at their ends, with the exception of small outlets *r* at the lower side, which will be connected from car to car by flexible pipes or tubes in the same manner as the pipes of the common air-brake. The cross-boards *p*, besides serving to stiffen the sills *n n*, prevent the water from moving in a body from end to end of the tank, which would be dangerous in stopping and starting suddenly; but suitable passage for the water is afforded by slightly cutting away the lower side of each cross-board, as shown.

In order that cans or vessels may be conveniently taken into or removed from the car to avoid unnecessarily delaying the train at stations, I provide two doors, *s*, in each side of the car, one at each side of the center and extending from just above the truss-timbers to, or nearly to, the wall or roof plate, said doors being in the panels between the upright timbers, and consequently not interfering in any way with the truss of the car-wall. In this way I afford a convenient opening without in

any degree weakening the car—a result not heretofore attained, so far as I am aware.

To further expedite the operations of loading and unloading the cans, I provide in the middle of the car an overhead track, *t*, upon which is carried a truck, *u*, from which I suspend a block and fall, or a simple rope or rod, to the lower end of which I pivot a strong lever, *v*, having a hook at its end. By depressing the hook it may be made to engage with the bail of one of the vessels, which will be raised out of the chamber D by depressing the lever-handle. The whole may then be carried lengthwise of the car by simply shoving it ahead, the truck *u* moving on its track until opposite the window or doors through which it is swung. A rope, *w*, provided with a hook, and running over a sheave or pulley, *x*, at the top of the window, serves to lower the can or vessel to the ground or platform. The same operation will of course serve for handling any other commodities in the manner explained.

The chambers D are furnished with cross-pieces, which are seated loosely in sockets or recesses to separate the cans or vessels, but which may be removed to permit larger vessels or articles to be inserted or removed, and that portion of the top of the air-chambers D between the doors J may also be hinged to open the entire top for the same purpose.

It will of course be understood that sufficient space will be left for the circulation of air on all sides of the water-chambers or the cans or vessels, strips, slats, or blocks being interposed, if necessary to that end.

While I have described my invention as particularly designed for application to the transportation of live fish and to passenger-cars, I desire it to be clearly understood that I do not by any means limit myself to either of these matters; but as these represent the most difficult features by which the problem of such transportation is attended, it is believed that by explaining the details necessary thereto any person at all familiar with such matters will understand what to omit when transporting less perishable matters, or when, instead of passengers, express goods or freight are carried in the body or interior of the car. In such cases the water tanks, and consequently the water-pipes, will not ordinarily be required.

The car may be used to carry fish in one direction and return with a load of fruits, meat, or other product abundant in the locality where the fish are delivered.

The exact location of the chambers, tanks, &c., may be varied in all respects save as to elevation, in which particular there should be little or no deviation from the plan shown and described.

By the term "load-line" or "line of load" I mean the line below which the principal weight of the load or cargo must be kept, the term being well understood by car-builders and railway men. This line varies according to the height and weight of the car, the width of the supporting-truck, and similar considerations, and also to the speed at which the cars are to travel.

I am aware that a patent has been granted for a refrigerating-wagon in which an ice-chamber was provided to supply cold air to the meat or provision chambers, and I am also aware that such a wagon has been for a number of years in public use. I make no claim to such construction, but I believe myself to be the first to construct a railway-car with two distinct and independent compartments, one adapted for the transportation of passengers in an ordinary temperature, and the other for the transportation of perishable matter in a cooled chamber. By this construction and arrangement I am enabled to control the temperature of the two compartments independently and at will, and I provide a convenient means of transporting perishable matter in the same conveyance with attendants or passengers without injury or inconvenience to either. It is particularly to be noted that this car is designed for high speeds, and the matter of having the weight below the line of load is therefore one of great importance, whereas in wagons no such necessity exists for throwing the weight low down; nor can such wagons be properly said to contain two compartments, one adapted for the transportation of perishable matters and the other for the accommodation of passengers, since in the wagon both the driver and the non-perishable goods were placed outside and exposed to the ordinary temperature of the atmosphere.

Having thus described my invention, what I claim is—

1. A railway-car provided with one or more refrigerating-chambers isolated from the interior of the car, substantially as shown and described, whereby the car is adapted for the transportation of perishable goods and passengers without subjecting the latter to an unusual temperature or atmosphere.

2. In a railway-car, one or more chambers located below the approximate line of load, and provided with non-conducting walls, substantially as and for the purpose explained.

3. A railway passenger-car provided with refrigerating-chambers beneath its seats, said chambers being isolated from the interior of the car, as set forth.

4. A railway passenger-car provided with chambers or compartments beneath its seats, communicating with an air-duct also beneath the seats, and an ice or cooling chamber communicating with said air duct, as explained.

5. A railway-car provided with one or more refrigerating or cooling chambers isolated from the interior of the car, and one or more ice-chambers located above the refrigerating-chambers and communicating therewith.

6. The combination, in a railway-car, of one or more refrigerating or cooling chambers located below the line of load, an ice box or boxes located above the chambers and communicating therewith, and a pipe or pipes opening from the upper part of the cooling-

chambers into the upper part of the ice-chambers, whereby a constant circulation of air through the ice box and chambers is secured.

7. In combination with the ice-box F, the water-tank E, located by the side of the ice-box, and furnished with tubes *m*, whereby the water is cooled, as explained.

8. In a car for the transportation of live fish, &c., requiring water, two vertically-adjustable water-tanks, arranged substantially as described, to be alternately raised and lowered, whereby the water may be caused to flow from one to the other alternately in opposite directions.

9. In a refrigerator-car for the transportation of fish, &c., requiring water, two water-tanks suspended from common cables passing over pulleys, whereby the weight of one tank is caused to counterbalance the weight of the other.

10. In a refrigerator-car, the combination of a vertically-moving water-tank and a rack and pinion for raising and lowering the same, as shown.

11. In a refrigerating-car for transporting fish, &c., a water-tank and a water-pipe provided with flexible tubes and couplings, in combination with a series of cans or vessels having nipples to receive said couplings, as and for the purpose set forth.

12. In a refrigerator-car, a cooling-chamber located below the line of load and having its inside wall made in the form of a truss, as set forth.

13. A non-conducting wall for the refrigerating-chamber of a railway-car, having its open space filled with papier-maché, as and for the purpose explained.

14. In a railway-car, the combination, with a carrying-wheel of the truck, of a friction-wheel adapted and arranged to bear upon the tread of said wheel, and to impart motion to a fan or apparatus in the car.

15. In combination with the pulley U′, secured upon a shaft carried by the car-body, the friction-wheel Q, carried by the truck and provided with spool or pulley R′, the pulley X′, also carried by the truck, and a belt passing about said pulleys, as and for the purpose specified.

16. In combination with a car-truck, a vertically-moving standard, S, secured to the truck and carrying a friction-wheel, Q, as and for the purpose explained.

17. The combination, in a car for transporting live fish, &c., of a water-tank, a series of vessels connected with said tank by a pipe or pipes, and an air-pipe opening into said vessels, whereby the fish are supplied with fresh air and water.

18. A refrigerator-car provided with a refrigerating or cooling chamber below the side trussing of the car, and a door above said trussing extending to the roof-plate and the full width of the panel, whereby a proper opening for the entrance and removal of goods is provided without weakening the car-wall.

19. In a car provided with side doors, as shown and described, the combination of an overhead track, a truck running upon said track, and a pivoted lever suspended from said truck, whereby goods may be lifted, transported, and thrust through said side doors, as set forth.

20. In a car substantially such as shown and described, a water-tank beneath the car, provided with cross-boards *p*, as and for the purposes set forth.

FRANK S. EASTMAN.

Witnesses:
WILLIAM W. DODGE,
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