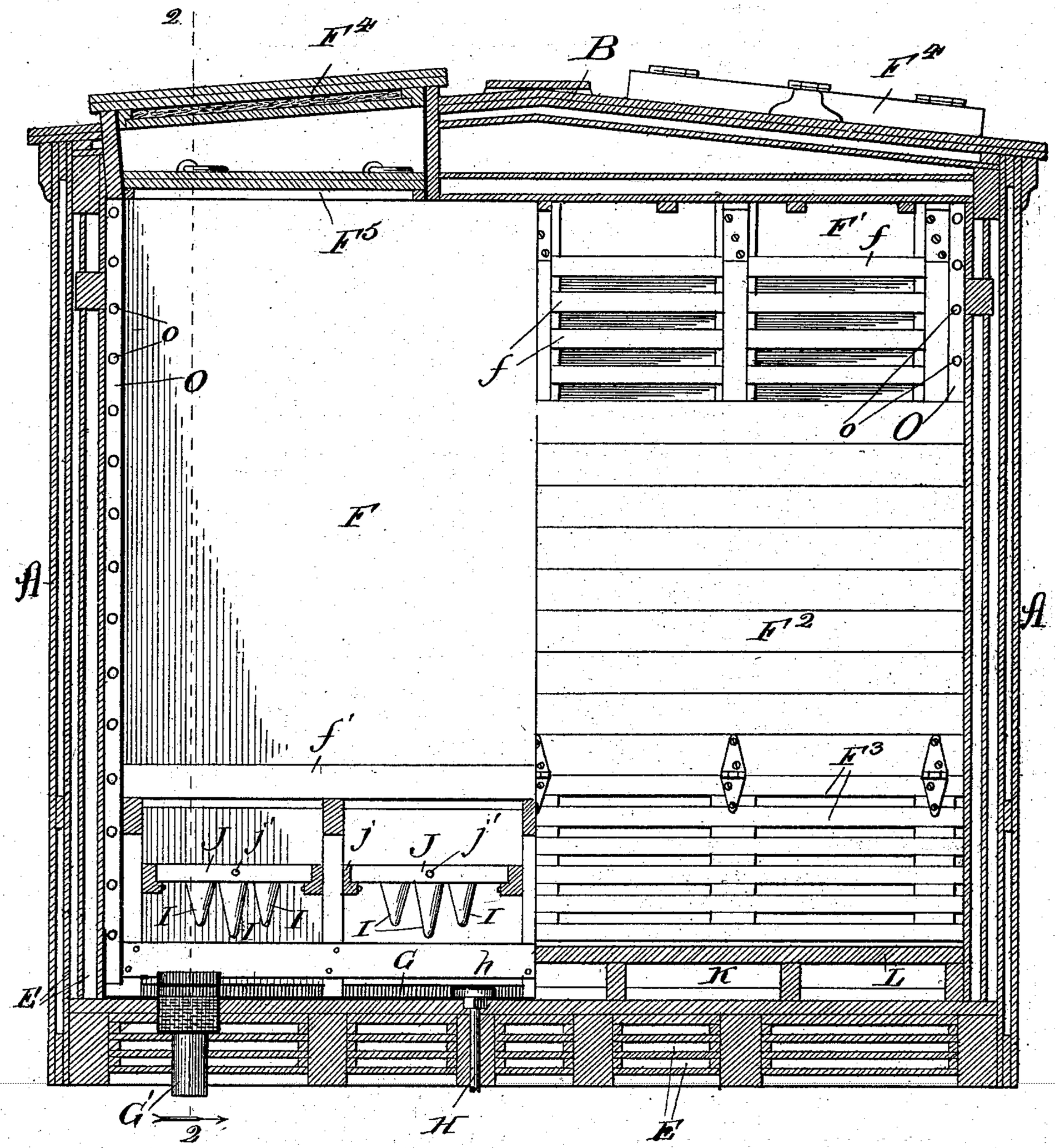
(No Model.) 5 Sheets—Sheet 1.

# J. PLAYER.

## REFRIGERATOR CAR.

No. 503,772. Patented Aug. 22, 1893.

Fig. 1.

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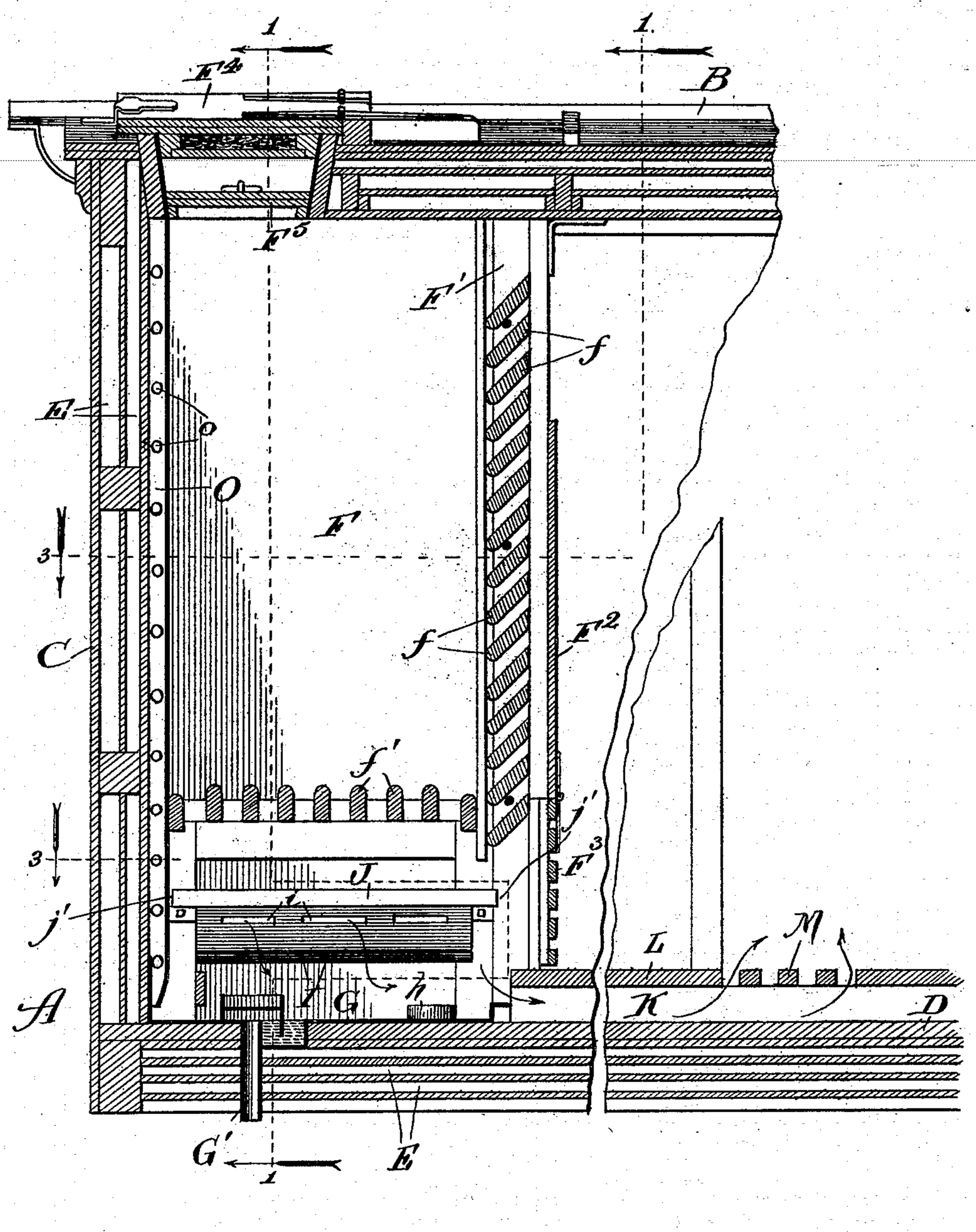
(No Model.) 5 Sheets—Sheet 2.

# J. PLAYER.

## REFRIGERATOR CAR.

No. 503,772. Patented Aug. 22, 1893.

Fig. 2.

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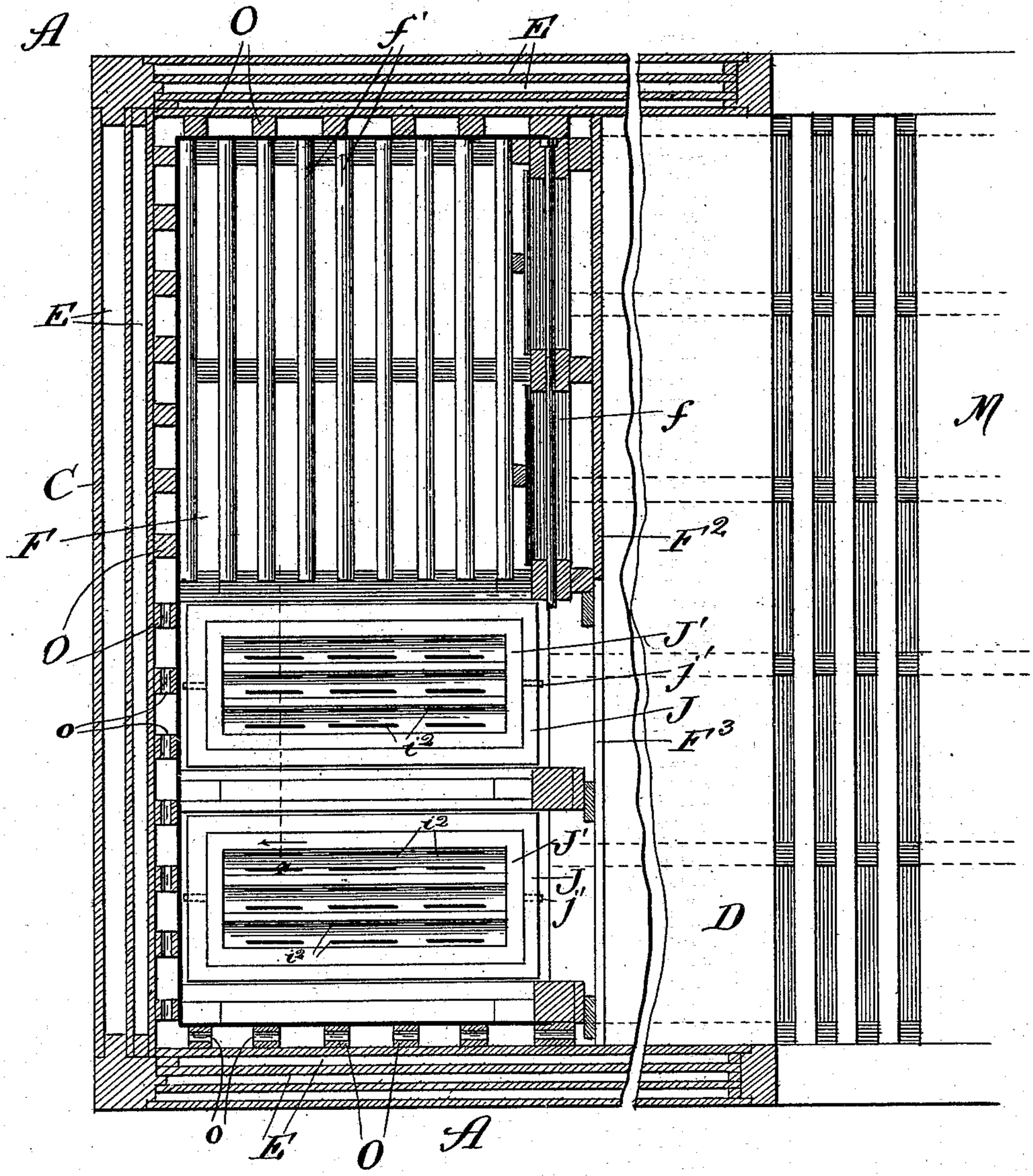
(No Model.) 5 Sheets—Sheet 3.

# J. PLAYER.

## REFRIGERATOR CAR.

No. 503,772. Patented Aug. 22, 1893.

Fig. 3.

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(No Model.) 5 Sheets—Sheet 4.

# J. PLAYER.

## REFRIGERATOR CAR.

No. 503,772. Patented Aug. 22, 1893.

Fig. 4.

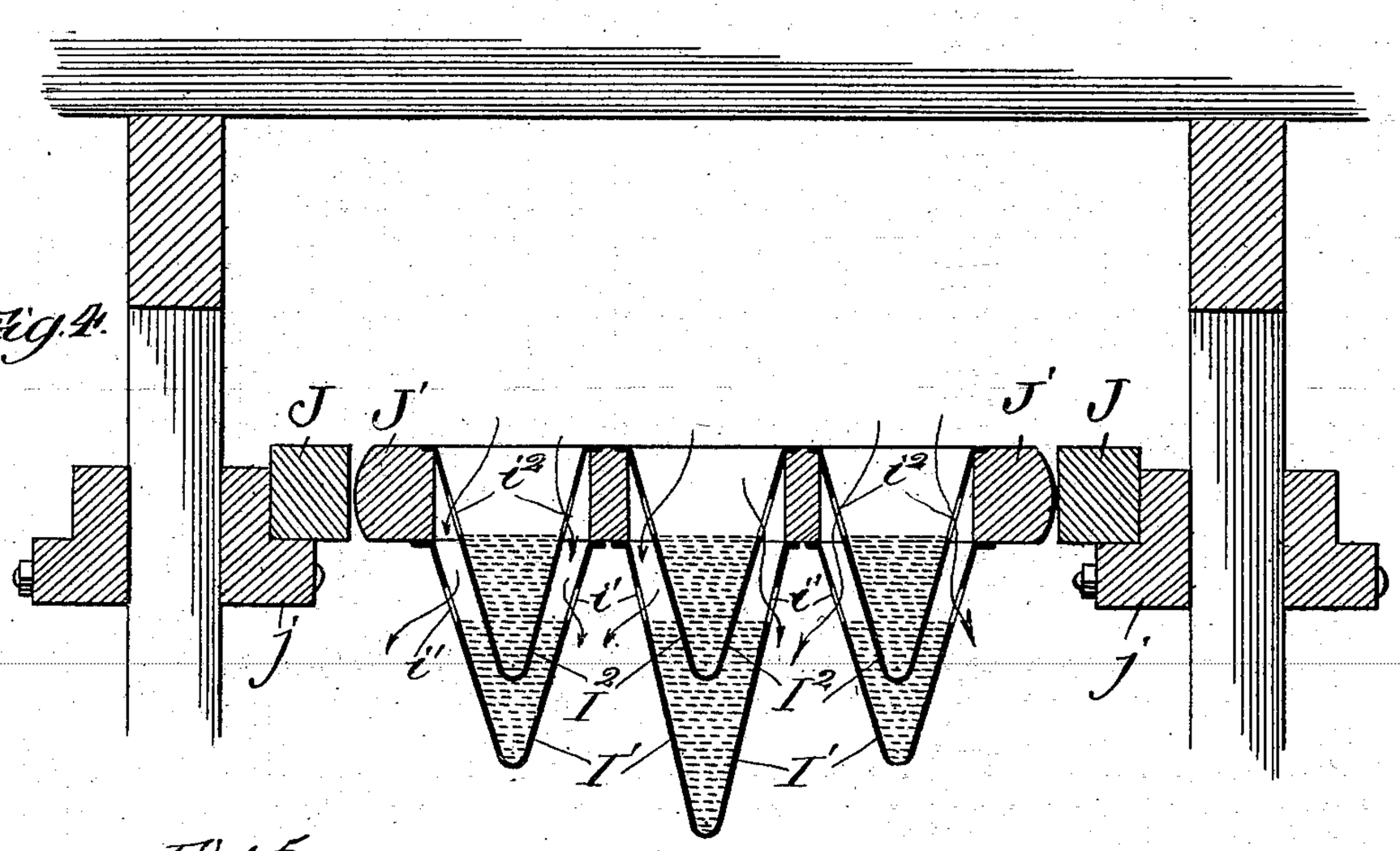



Fig. 5.

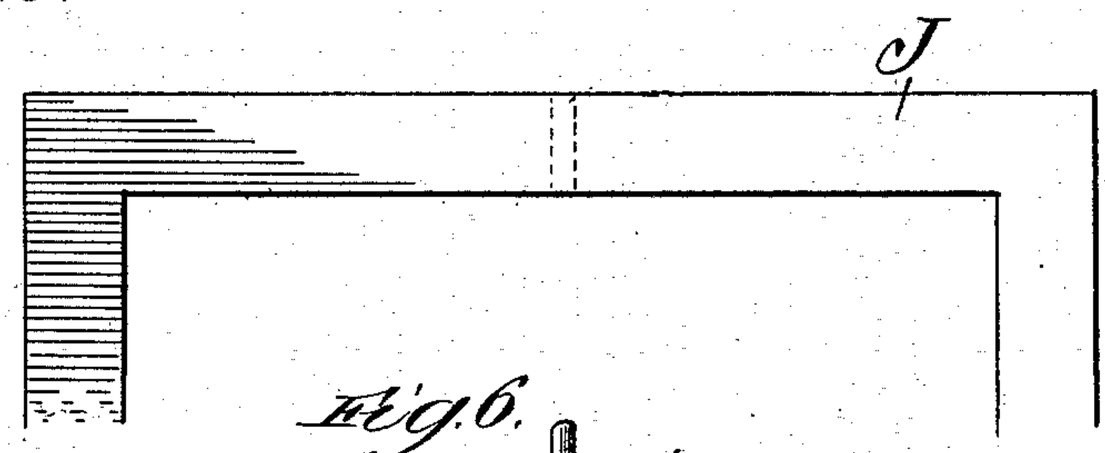
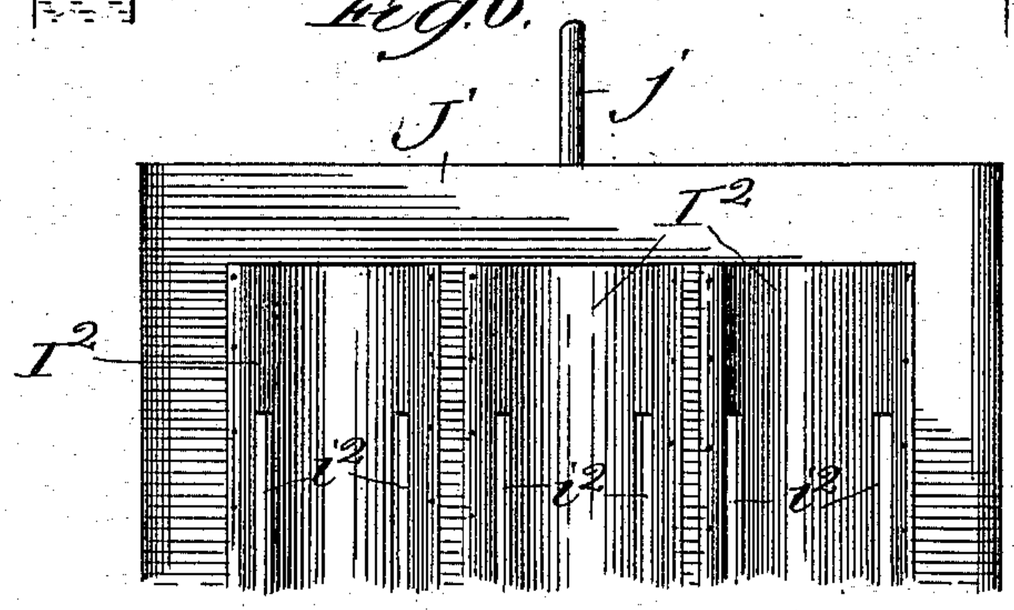



Fig. 6.

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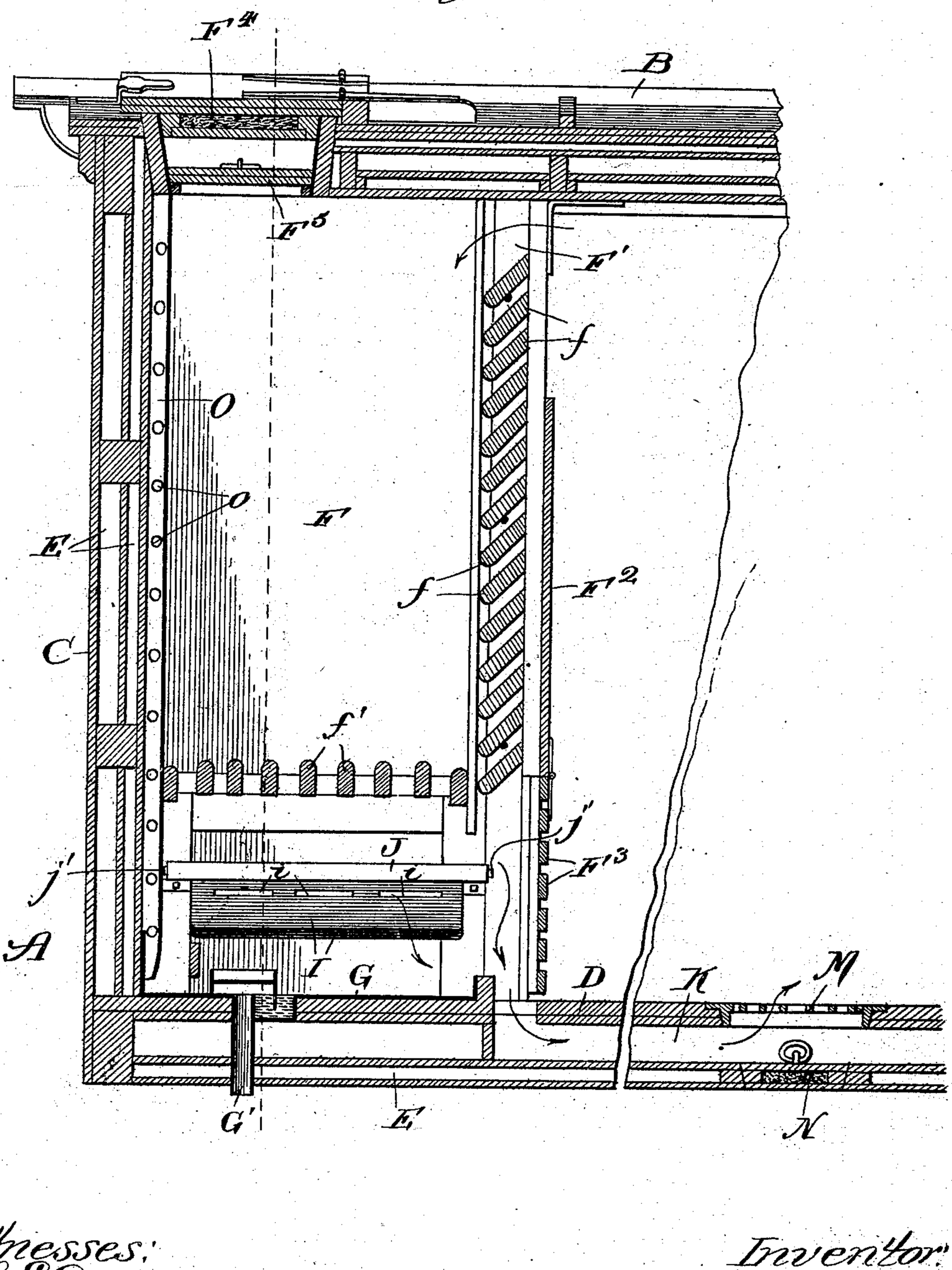
(No Model.) 5 Sheets—Sheet 5.

# J. PLAYER.

## REFRIGERATOR CAR.

No. 503,772. Patented Aug. 22, 1893.

Fig. 1.

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# UNITED STATES PATENT OFFICE.

JOHN PLAYER, OF TOPEKA, KANSAS.

## REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 503,772, dated August 22, 1893.

Application filed February 2, 1893. Serial No. 460,712. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN PLAYER, of Topeka, Kansas, have invented certain new and useful Improvements in Refrigerator-Cars, of which the following is a specification.

These cars, many forms of which are in constant operation over the various lines of railroads in this country, are, as is well known, intended and adapted for the purpose of transporting perishable articles, or articles which are likely to be impaired by heat, from one point to another. The two most important objects to be attained are the maintenance of a sufficiently low temperature within the car, and—depending to some extent upon the first requirement—the prevention of the admission of outside air to the interior of the car, where it would raise the temperature. Under ordinary conditions, those portions of the car which are at and adjacent to the ice box or boxes would be colder than those portions of the car more distant from such ice boxes. Of course, the tendency of the colder air would be to fall, and thus start a certain amount of circulation through the car. Inasmuch as this circulation is very important for the maintenance of the requisite degree of temperature, another important point to be attained in the construction of these cars is to provide means whereby this circulation may be created and promoted in the simplest, most direct and efficient manner.

The object of my invention is to provide a car which shall attain the above advantages and provide an efficient system of internal circulation. This car is further provided with means for prolonging for as great a time as possible the contact of the refrigerant with the air, thereby avoiding waste and increasing the distance which the car can travel without a fresh supply of ice, or other cooling medium employed.

It is further my design to simplify and improve upon various details of the construction of the car, as will be hereinafter made apparent from the specific description.

My invention, therefore, consists in the features, details and combinations hereinafter described and claimed.

In the drawings, Figure 1 is a vertical cross section of a car provided with my improvements, taken on lines 1 1 of Fig. 2, one half of the section being upon each of these lines; Fig. 2 a vertical longitudinal section of one half of a car, taken on the line 2 of Fig. 1, and partly condensed by breaking out a portion of the car in order to show a grating located at or near the center of the car, as hereinafter described; Fig. 3 a cross section on line 3 3 of Fig. 2, one half of the section being taken upon each line; Fig. 4 a section upon line 4 of Fig. 3. Figs. 5 and 6 are details of construction; and Fig. 7 is a sectional view similar to that shown in Fig. 2, but illustrating a modification—all of the sections being taken in the directions indicated by the respective arrows; and Figs. 4, 5 and 6 being upon an enlarged scale.

The car proper, that is, its walls A, roof B, ends C and flooring D, is made in most particulars, except as hereinafter indicated, in any of the desired forms; and I do not desire to limit the application of my particular improvements to the special general construction shown in the drawings. The walls, flooring, and roof of the car are preferably made double, treble or quadruple, with any desired number of air spaces, E, between the separate portions of the wall, which air spaces may, if desired, be filled with any suitable material which will serve to insulate the interior of the car. This car is provided with one or more ice tanks, made substantially in the form shown in Fig. 2, there being preferably one of these tanks at each end of the car. In the preferred construction, the front wall of the tank is made of inclined slats, *f*, and the bottom of horizontal slats, *f'*, an opening, F', being preferably left above the slats in the front. To protect this tank, I prefer to provide a sheathing, $F^2$, the lower part of which is made in the form of a slatted door, $F^3$, adapted to be raised and lowered when it is desired to obtain access to the space beneath the ice box. This ice box is provided with the usual opening through the roof for the admission of ice, which is closed by a door, $F^4$ and a plug, $F^5$, which fits closely against the beveled sides of the opening, as shown in Figs. 2 and 7. Beneath this ice box, on or near the floor of the car, is arranged a pan, G, for catching the water as it falls from the melting ice, and which is provided with a

discharge pipe and trap G′, preferably so constructed as to provide a water seal to prevent the entrance of air into the car. To cover the stay bolts, H, and to permit access to them when desired, I provide the pan with caps, *h*, which fit over the heads of the stay bolts, but which may be removed when it is desired to take out any of these bolts. (See Fig. 1.)

In order to prolong as much as possible the use of the refrigerant, I interpose between the pan G, and the bottom of the ice box, supplementary pans or troughs, I. The construction of these troughs and their supports is more particularly shown in Figs. 4 to 6, inclusive. A frame, J, is supported in any suitable manner, as by means of blocks, *j*, at any desired point beneath the bottom of the ice box. In this frame, a frame J′ is supported upon trunnions, *j′*, in such manner as to be free to rotate or revolve in the frame J. It is in this latter frame that the troughs or pans, I, are supported. These troughs are preferably made of sheet metal, of any desired dimensions, and preferably, though not necessarily, in two parts, I′, I², the latter being smaller than, and supported inside of the former, with a space between them, as shown in Fig. 4. These troughs are each provided with orifices, lettered respectively, *i′*, *i²*. There may be any number of these troughs desired. In the drawings, I have shown two sets containing three double troughs each running beneath the ice tanks lengthwise of the car. While I have, in Fig. 3, shown but two frames, J′, with the troughs supported thereby, it will be obvious that in actual operation I should prefer to have two more sets placed beside the two shown beneath the slats *f″*; but these two latter sets have been omitted for the sake of clearness in the drawings. This number of sets, however, may be diminished or increased, and they may be swung transversely to the car as desired, and the number of the troughs in each set, and their arrangement, may be varied as desired. For example, there may be three troughs, one within the other, instead of two, and so on. This portion of my invention operates as follows: The melting water which flows from the ice box first enters the trough or troughs, I², (in any case the innermost trough or troughs, no matter how many be used); it rises in these troughs, I² until it reaches the openings *i²*, then passes through these openings into the trough or troughs I′, in which it rises until it reaches the openings *i′*, when it passes through these openings and falls into the pan G, from which it passes out of the car through the trap G′. In this way, a constant quantity of ice water is maintained in the auxiliary troughs, and the use of the refrigerant is prolonged, thereby increasing the efficiency of action of the car. When it is desired to empty these troughs, they may be rotated on their trunnions, and the water discharged through the openings *i′*, *i²*, after which the troughs may be again swung back into their normal position. When more troughs than two are placed one within the other, the water passes from one to the other throughout the series. When only one is used, it passes directly from this trough to the pan G.

To provide for and facilitate the production of suitable air currents, I prefer to construct the car with an air duct or ducts under its floor, communicating with the space beneath the ice box; and opening at or near the center of the car. This object may be arrived at in a variety of ways, of which I have shown two. In Figs. 1 and 2, I have shown this air space, K, as formed by means of a supplementary or additional flooring, L, placed within the car and supported a desired distance above the main flooring D. The channel thus formed opens into the space beneath the ice box, as indicated by the arrow in Fig. 2, and also communicates with the interior of the car by means of a suitable grating, M, placed at or near the center of such car, which may be made to open as desired. This construction is best adapted to remodelling or adding my improvements to old cars.

In Fig. 7 the air duct or ducts, K, are shown as located beneath the main floor, D, being formed by means of an additional supplementary flooring—this flooring being shown as one of the insulated floorings already referred to. In this construction, the grating M is preferably made in the form of an iron casting, adapted to be lifted out when desired; and the lower flooring is closed by means of a plug, N, similar in construction to the plug which closes the opening into the ice box. When the grating has been removed, this plug may be lifted out, thereby affording access to the air space for cleaning out the same. This manner of construction is well adapted for use in building new cars containing my improvements. The operation of this part of my invention will probably be obvious from the drawings, but may be briefly stated. As the air becomes chilled by contact with the ice, or other refrigerant used, it will fall in the ice box and enter the passage or passages, K, beneath the floor. Warmer air is then drawn in through the opening F′, and the air in the ducts passes through the grating into the car, to replace that which has entered the ice box. In this way, a continuous and efficient circulation is promoted and maintained in a very simple manner. To assist in the circulation, I prefer to provide the furring strips or timbers, O, with holes, *o*, through which the air currents can pass.

By means of the above construction, I am enabled to provide a car of the highest efficiency in operation, combined with great simplicity of construction; and, while I have described more or less precise forms, I do not intend to unduly limit myself thereto, but contemplate all proper changes in form, propor-

tions, and the substitution of equivalent members, as may be desirable or necessary.

I claim—

1. In a refrigerator car, the combination of an ice box, a stationary pan at the floor of the car beneath such ice box, and a trough rotatably supported at a point beneath such pan and ice box, substantially as described.

2. In a refrigerator car, the combination of an ice box, a series of troughs arranged one within the other and supported beneath the box, such troughs communicating with each other, whereby as the water escapes from the box it will pass successively through the various troughs in the series before escaping from the car, substantially as described.

3. In a refrigerator car, the combination of an elevated ice tank having a bottom provided with openings for the escape of water, a pan beneath such tank, and a series of double troughs supported between such bottom and the pan and communicating with each other, whereby the water which passes from the tank passes through the series of troughs before reaching the pan, substantially as described.

4. In a refrigerator car, a series of troughs placed one within the other, open at their tops, and provided with discharge orifices in their sides, whereby the water falls into the first trough, accumulates therein until it reaches the orifices in its sides, then passes into the next trough, similarly accumulating therein until it reaches the discharge orifices, out through which it passes substantially as described.

5. In a refrigerator car, a series of substantially V-shaped troughs placed one within the other, the innermost trough in the series being open at its top and provided with discharge orifices in its sides, the remainder of the series of troughs being all provided with discharge orifices, whereby the water will accumulate in each successive trough until it reaches the discharge orifices through which it will pass from one trough to another throughout the series, thereby maintaining one or more bodies of cold water within the car substantially as described.

6. In a refrigerator car, the combination of an elevated ice-box, and a series of communicating troughs placed one within the other and carried by a frame pivoted beneath such box, substantially as described.

7. In a refrigerator car, the combination of an elevated ice box communicating with the car, a duct beneath the floor communicating with the space beneath the ice box and the space within the car, and a series of troughs placed between the bottom of the ice box and the floor of the car to maintain a body of cold water at this point, whereby the air passing into the duct is brought into contact with the troughs, substantially as described.

8. In a refrigerator car, the combination of an ice box, a stationary frame placed at a point beneath the bottom of this box, another frame rotatably mounted in the stationary frame, and a series of communicating troughs supported in the rotating frame, substantially as described.

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