

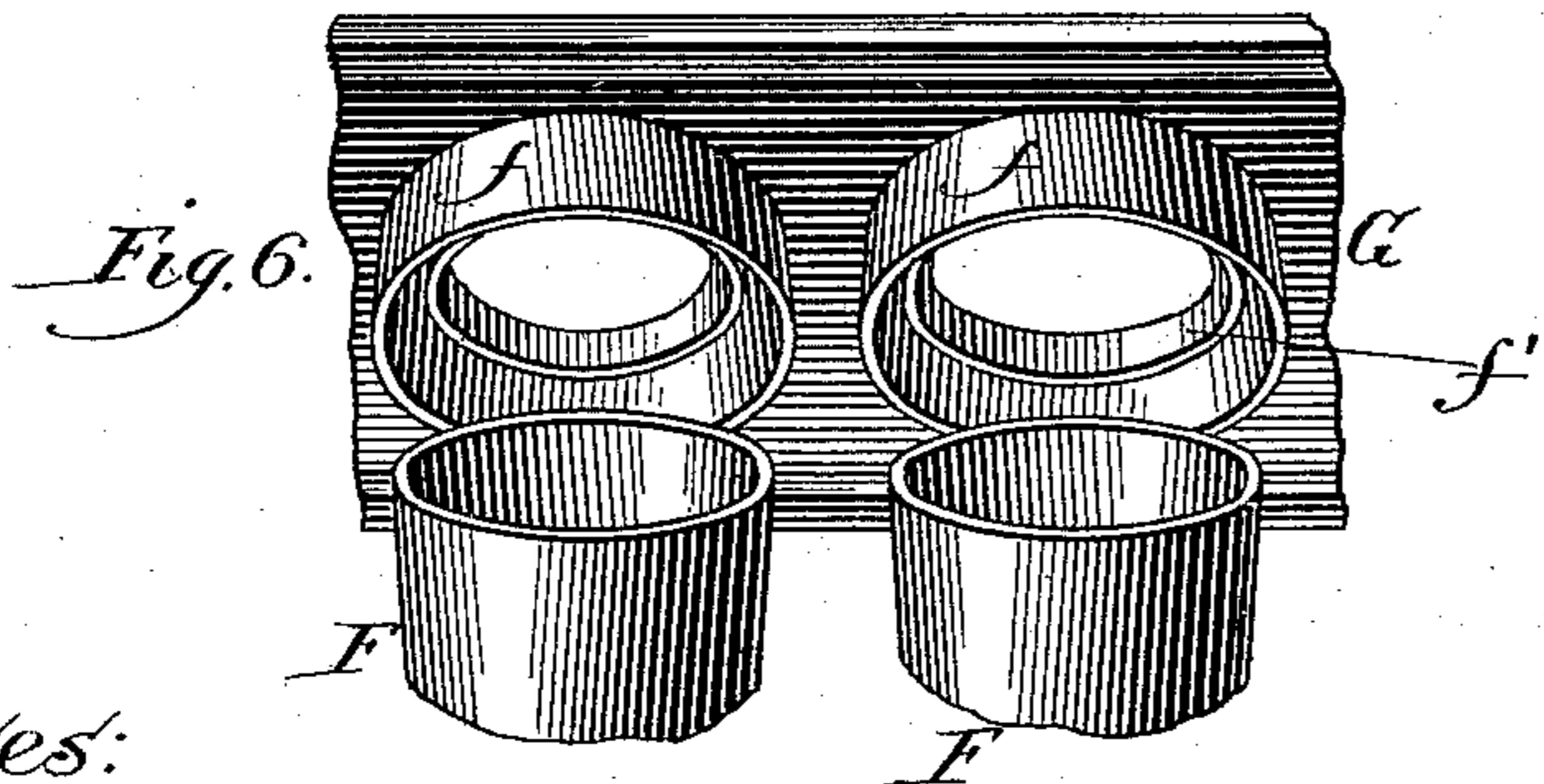
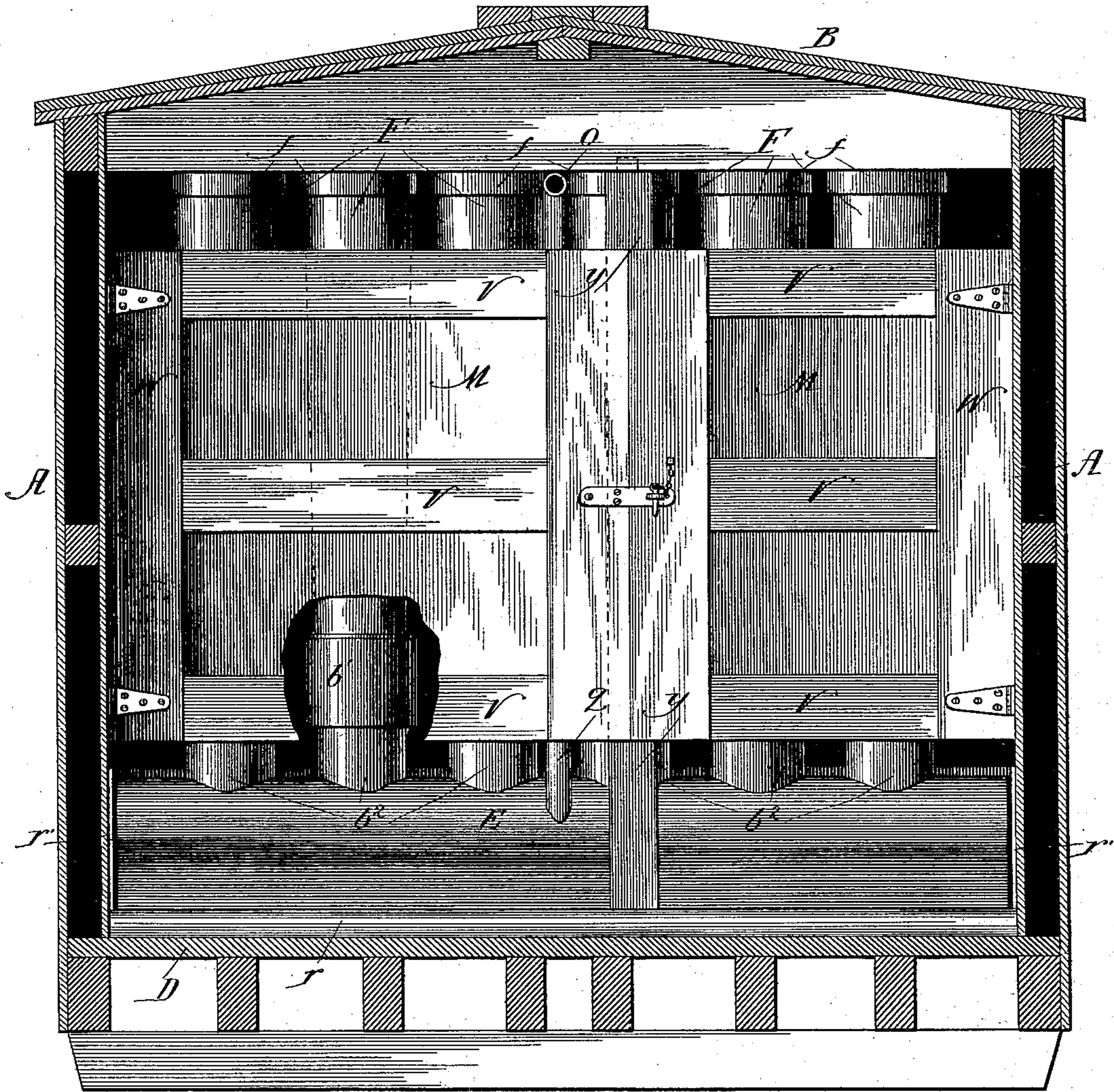
(No Model.)

3 Sheets—Sheet 1.

N. BOSMANN.
REFRIGERATOR CAR.

No. 376,024.

Fig. 1. Patented Jan. 3, 1888.



Witnesses:

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Howard B. Hallor.

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By. A. M. Stout
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(No Model.)

3 Sheets—Sheet 2.

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REFRIGERATOR CAR.

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Patented Jan. 3, 1888.

Fig. 2.

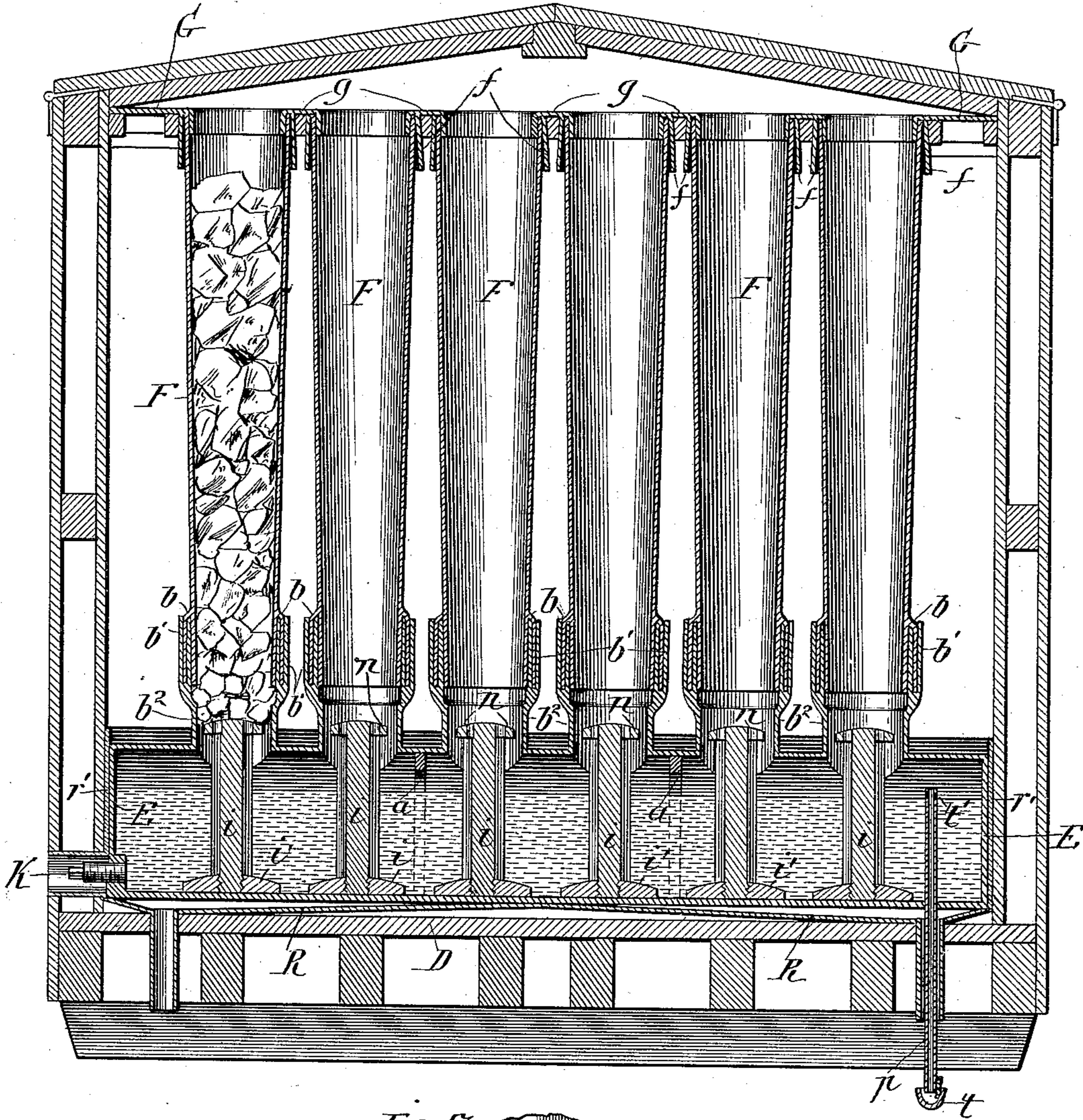
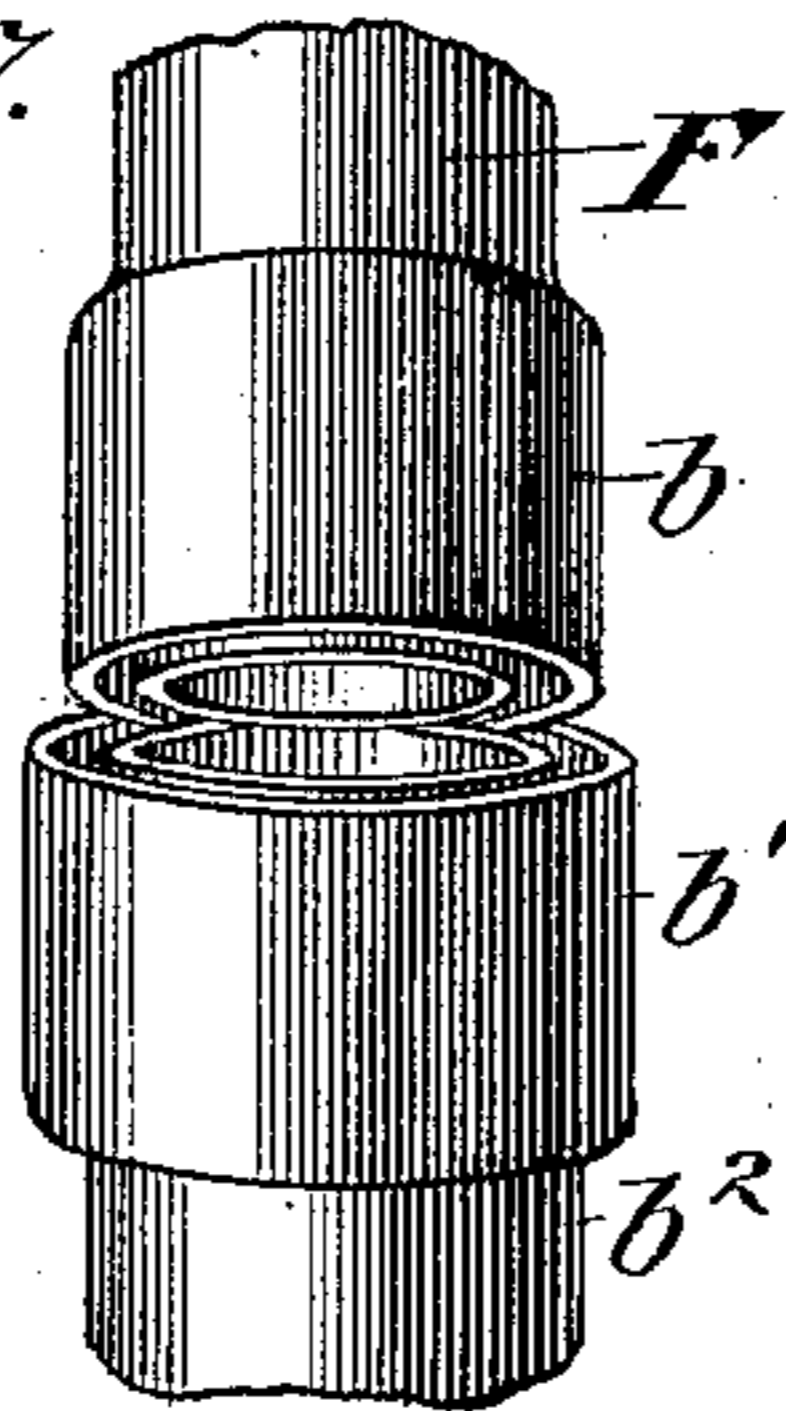


Fig. 7.



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(No Model.)

3 Sheets—Sheet 3.

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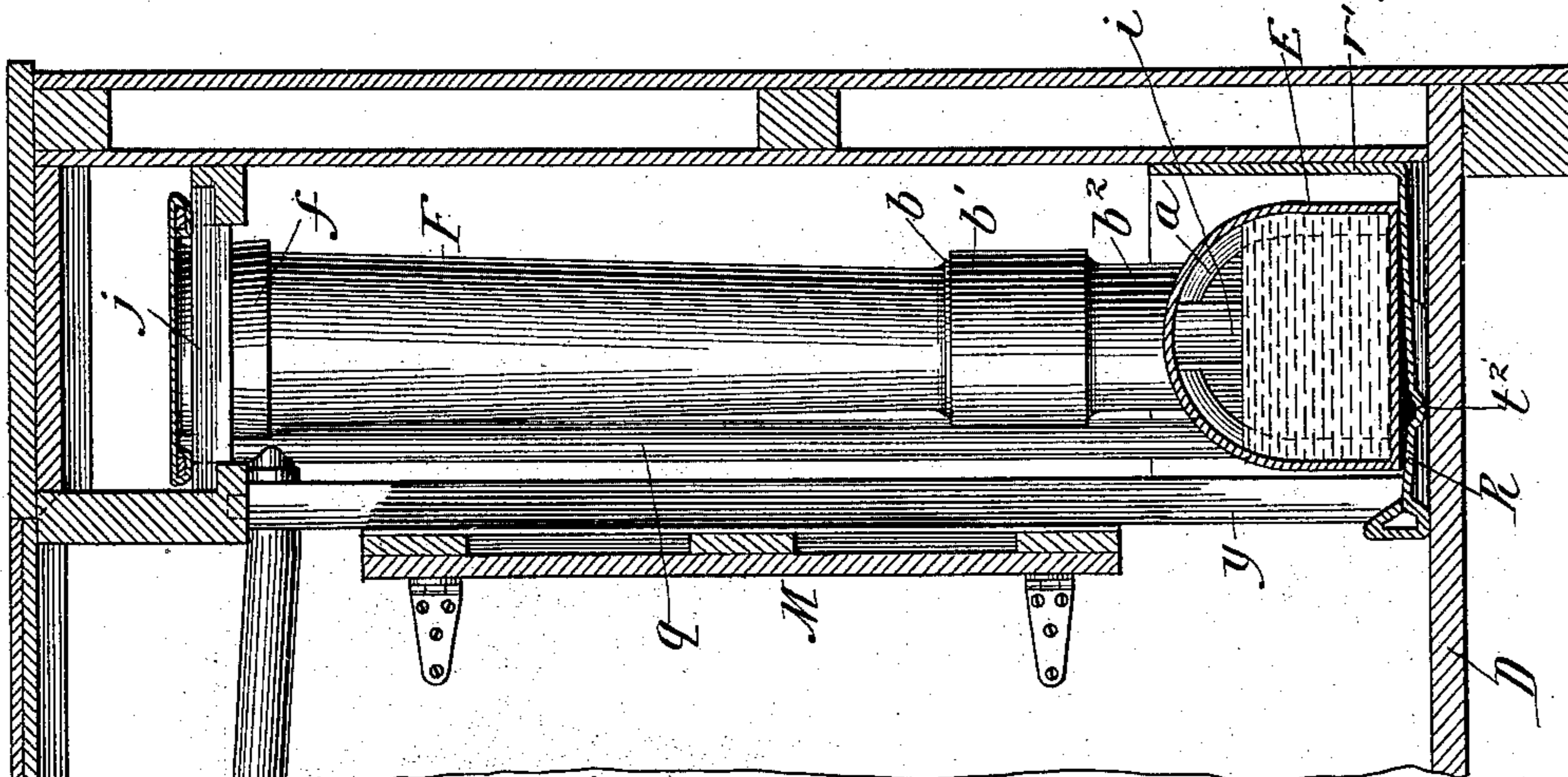


Fig. 3.

Fig. 9.

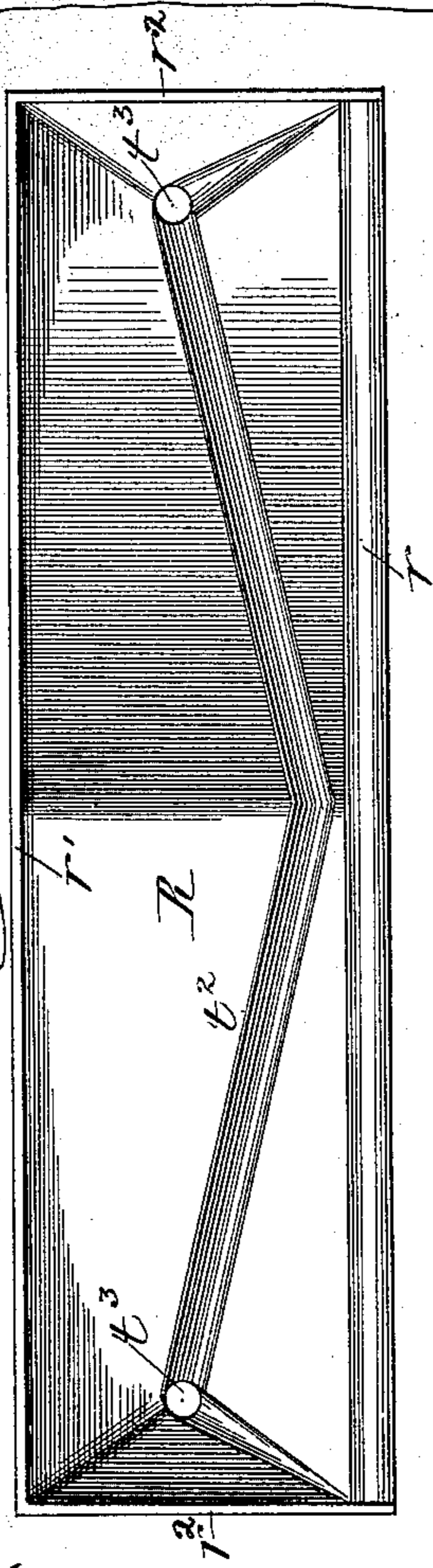


Fig. 8.

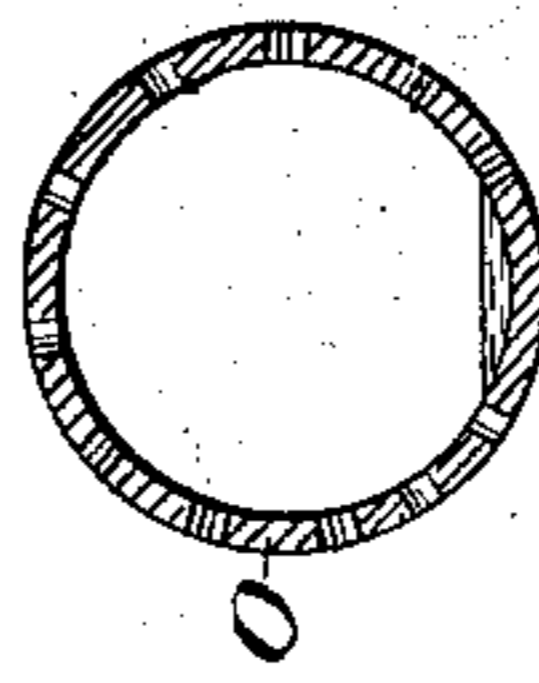


Fig. 10.

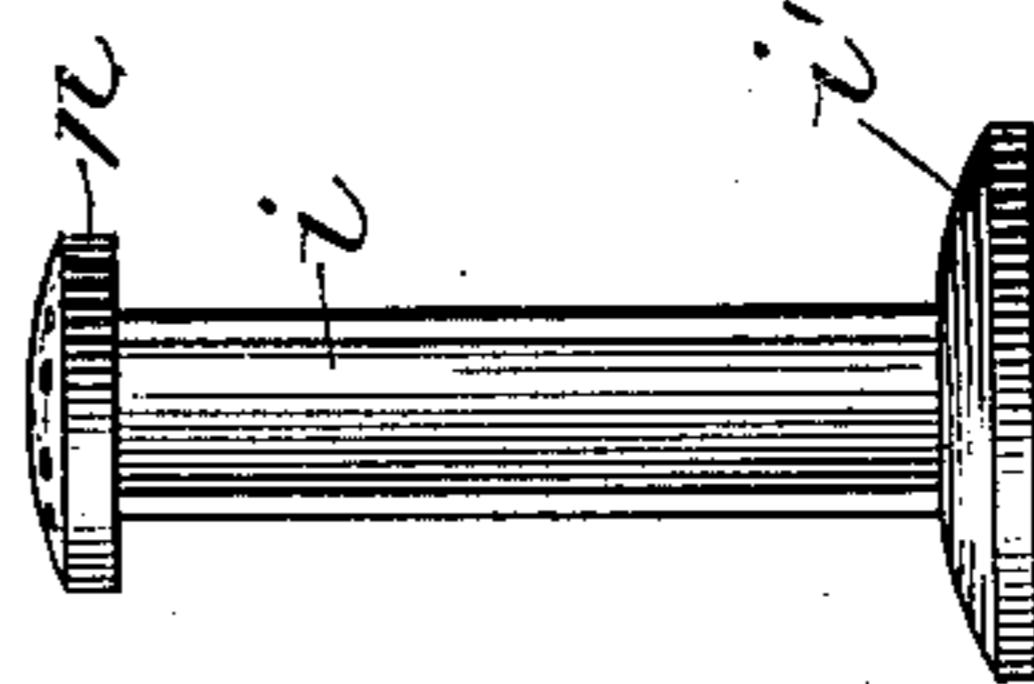


Fig. 5.

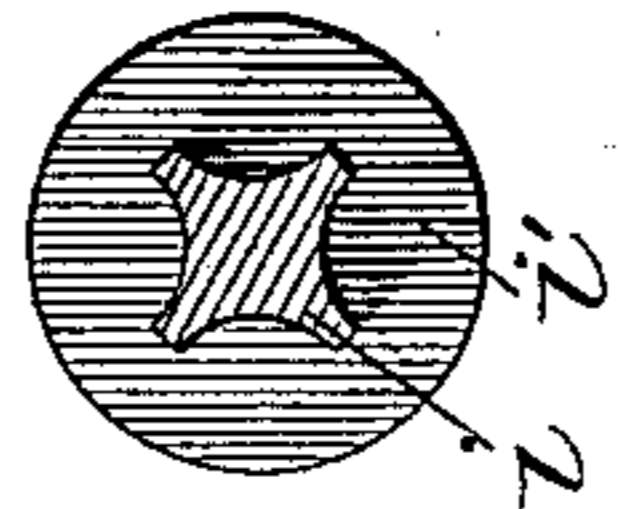
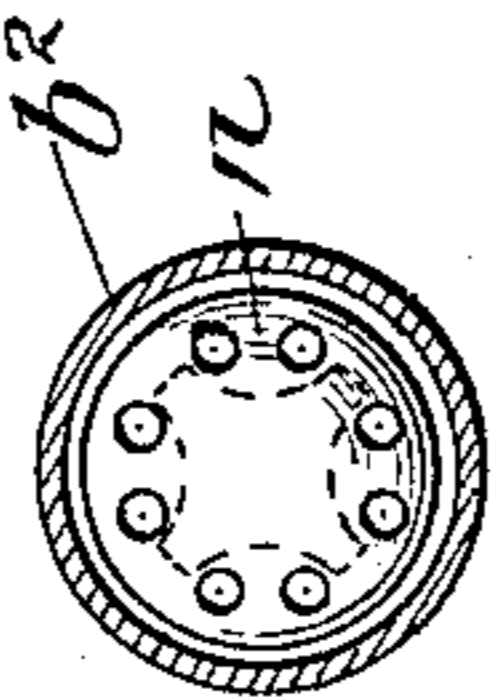


Fig. 4.



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UNITED STATES PATENT OFFICE.

NICOLAS BOSMANN, OF LAKE, ILLINOIS.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 376,024, dated January 3, 1888.

Application filed March 11, 1887. Serial No. 230,546. (No model.)

To all whom it may concern:

Be it known that I, NICOLAS BOSMANN, of Lake, county of Cook, and State of Illinois, have invented certain Improvements in Refrigerator-Cars, of which the following is a specification.

My said invention will be fully described hereinafter with reference to the accompanying drawings, in which—

10 Figure 1 represents a vertical cross section of a railroad-car provided with my improvement, the section being made just within the doors separating the ice-pipes from the interior space of the car; Fig. 2, a like section of the same made through the ice-pipes F; Fig. 15 3, a vertical central longitudinal section of about half the length of the car; and Figs. 4, 5, 6, 7, 8, 9, and 10, detail views of various parts.

20 In the drawings, A indicates the side walls of the car, B its roof, and D its floor; E, the reservoirs for the water resulting from the melting of the ice used in rendering the air cold, and they extend across the ends in the interior of the same and under the lower ends 25 of the ice-pipes F, and their bottoms rest upon the water-pans R, which have short flanges r on their inner sides, higher ones, r' , in their outer sides, and also end flanges, r'' , which 30 water-pans serve to catch and hold any water that may come into them from condensation of vapor upon the outer surfaces of the pipes F or otherwise. The bottoms of the pans stand higher midway of their length than at their 35 ends, and they are provided with channels t^2 , which are formed by depressing the material of which they are made, which may be any suitable sheet metal, and the channels lead the water into holes near each end of the pans, 40 and thence down through the floor of the car. The reservoirs E and the waste-pans R may be made of galvanized sheet-iron, or of any other suitable material of sufficient strength and thickness for the purpose in view. The 45 end walls of the reservoirs will sustain any pressure that may be properly brought to bear upon them; but to support their middle portions between their ends I have devised the arches a , made of any suitable material having 50 the form shown in the drawings, and they stand upon the bottoms of the reservoirs on the inside of the same, and are soldered or

otherwise securely fastened to the walls of the same.

The tops or covers of the reservoirs or tanks 55 E are provided with a series of cup-like projections, b^2 , of like material, extending vertically upward a few inches, and corresponding in number and form with the ice-pipes F, and around these cups b^2 are placed and fastened 60 tubes b' , of like material, the lower ends of which are fastened tightly to the cups b^2 , just above the tops of the reservoirs, while their upper ends may extend a little above the edges of the cups; but they are made so much larger 65 than the cups as to leave annular spaces between the two parts for the insertion of the rings b on the lower ends of the ice-pipes.

The ice-pipes F may be made of galvanized sheet-iron, or of any other suitable material, 70 and they are preferably made to increase in diameter from their lower to their upper ends, and their lower ends are provided with flat rings b , fastened around them, but so much larger than they are as to leave annular spaces 75 between the two parts for the cups b^2 on the reservoirs to be inserted between them, as shown in Fig. 7. The flat rings b have their upper edges made fast to the ice-pipes F by water-tight joints, so that when the pipes F 80 are connected with the reservoirs by means of the forms and construction above specified their lower ends will rest with their flat rings b within the tubes b' on the cups b^2 , while the 85 lower edges of the tubes F themselves will rest within the cups b^2 , and the upper ends of the cups b^2 will enter between the lower ends of the ice-pipes and their flat rings b , and so, by reason of the smoothness of adjoining parts and a certain degree of elasticity, close joints 90 are made between the pipes and reservoirs, and yet the pipes may be easily detached when required and as easily attached again.

The tapered tubes or pipes F are designed to be filled with broken ice from their upper 95 ends, and they are tapered, as specified, in order that their sides may in part sustain the weight of the ice in them; but for direct supports for the columns of ice in them I have provided the supports i , the lower ends of which are 100 screwed into the bases i' , which rest upon and are fastened to the bottoms of the reservoirs E by either riveting or soldering, so that they will be held steadily in position in spite of

the irregular movements of the car. Their upper ends are provided with caps *n*, which are perforated with holes, as shown, through which the water from the melted ice will pass into the reservoirs below. The broken ice will mainly be sustained by these caps. Now, in order to hold the top ends of the pipes steadily in vertical position, I have devised the cross-plates *G*, which extend across the ends of the car, and the ends of which are supported by the side walls of the same, and they are provided each with a double series of downwardly-projecting annular flanges, *f* and *f'*, corresponding in form and position with the top ends of the pipes *F*, the outer ones, *f*, large enough and adapted to fit down over and outside of them, and are flared out a little at their lower edges for that purpose, while the inner flanges, *f'*, are just small enough to fit down snugly within them, and they are a little shorter than the outer flanges, as shown in Figs. 2 and 6. The plates *G* are not designed to contain or sustain the ice used to cool the air, but merely to hold the upper ends of the ice-pipes in position. The ice-pipes themselves, however, are the receptacles for the broken ice, and they extend entirely across the ends of the car, and their weight and a portion of the weight of the ice is sustained by the arched tops of the reservoirs, and the residue of such weight is sustained by the supports *i*, which rest upon the bottoms of the reservoirs, and the reservoirs themselves and the water-pans rest upon the floor of the car. By this construction and arrangement of parts the pressure of the weight of the ice is as far removed as practicable from the top of the car. If, however, the ice were above the pipes, the car would be rendered top-heavy, and all the parts and attachments of the cooling apparatus would be subjected to great strain by the usual movements of the car while running.

As supports for the middle portions of the plates *G*, I have devised the bars *j*, the ends of which rest on proper bearings furnished by the body of the car, as shown in Fig. 3, one between each two adjoining ice-pipes.

In order to afford convenient access to the interiors of the reservoirs to clean them out, when required, or for any other purpose, I have inserted the screw-plugs *k*, of suitable size, into one end of each, having a square or many-sided outer end, to be taken hold of and operated by a suitable wrench.

In order to discharge the water from the reservoirs as fast as may be required, the pipe *P* is inserted up through holes in the bottoms of the car, the waste-pans *R*, and reservoirs *E*, and they extend nearly as high as the tops of the reservoirs, and are perforated with holes *t'* near their upper ends, in order that the water may enter them, so as to pass down and out, even if the passage of the water into them should be obstructed from above. The lower end of the pipe *P* is provided with a trap, *t*,

to prevent the wind from passing up through it from below.

The inner sides of the reservoirs, near the center of their lengths, are provided with cold-air pipes *q*, which extend up from the interior of the reservoirs through the cross-plates *G*, and from points near their upper ends another air-pipe, *o*, is connected with them. The air-pipe *o* is perforated with small holes, which begin about one-fourth of its length from each end thereof, so that the cold air from the reservoirs will be discharged through the perforations into the middle portion of the car; but in order that any water resulting from condensation of vapor may be caught and conducted into the reservoirs, the pipe *o* is bent upward near its middle, so that each end will incline downward, and about one-fourth of its lower periphery is made without any perforations at all, so that it will serve as a leading-trough to catch and carry off any water that may result from vapor, it being an important object to prevent as much as practicable the presence of water in that portion of the interior of the car designed for the storage of commodities intended to be kept cool.

In order that the ice-pipes *F* and the air-pipes *q* may be fully protected against any pressure, or even contact with the commodities contained in the car, I have devised two pairs of strong doors, *M*, one at each end of the car, to fence off the ice-pipes from that portion of the interior intended to hold commodities. Each door is composed of two vertical bars and three horizontal bars, *v*, to which are fastened on the side next the pipes *F* sheets of any suitable metal. Each door is hinged to a side wall of the car, and a pair of them at each end of the car are closed together and fastened upon a post, *y*, which extends from the floor to the frame of the roof above, as shown in Fig. 1.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a car, of a series of ice-pipes in its interior, at each end thereof, extending across the car, connected at their lower ends by detachable close joints with reservoirs for the water resulting from the melting of ice, and the cross-plates *G*, supported upon the body and frame of the car and provided with a series of double flanges, *f* and *f'*, one of which fits down over the outside of the ice-pipes and the other down within the inside of the pipes, thus forming close and detachable joints with the said pipes, substantially as described.

2. The combination, in a car, of a series of ice-pipes, *F*, extending across the same at each end in its interior, the cross-plates *G*, the ends of which are supported by the side walls of the car, and the series of bars *j*, which are furnished support by the car, and which sustain plates *G* against sagging at points between the side walls of the car, the said plates being provided with double flanges *f* and *f'*, extending down from suitable openings in the same

adapted by size, form, and position to embrace the upper edge of the pipes and form closed and detachable joints with the same, substantially as described.

5 3. The combination of the series of ice-pipes F, provided at the lower ends with rings b , the upper ends of which are permanently and securely fastened thereto by close joints, and so much larger than the pipes as to leave
10 annular spaces between the rings and pipes large enough to receive therein the cups b^2 , which project upward from reservoirs E, and the said reservoirs E, with series of vertical cups b^2 projecting upward therefrom, corresponding in form and position with and below
15 the said ice-pipes, but so much larger in diameter than said pipes as to receive the lower ends thereof within them, and also provided with tubes b' encircling them, but so much
20 larger than the cups as to leave annular spaces between the cups and tubes for the ring b , said tubes b' having their lower edges fastened permanently to and making close joints with said cups, the whole adapted to form close and de-
25 tachable connections between the pipes F and reservoirs E by means of mere friction of smooth surfaces and partially-elastic parts, substantially as described.

4. In combination with a series of ice-pipes, 30 F, the supports i , having bases i' , into which they are screwed, and perforated caps n , standing upon said bases and extending up into the lower ends of pipes F, adapted to support in part the weight of the columns of ice in the
35 pipes and receive the water from them, substantially as described.

5. The combination of the air-pipes q , having the lower ends in communication with their respective reservoirs, and their upper
40 ends to extend about five-sixths of the way up to the roof of the car, with perforated pipe o ,

which extends from one of the pipes q to the other and opens into both of them, adapted to conduct the water from condensed vapor into the reservoirs, substantially as described. 45

6. The described reservoirs E, having flat bottoms and arched tops, which are provided with series of cup-like projections b^2 , corresponding in form and position with the described series of ice-pipes, and which are also
50 provided with supports i , the bases i' of which are securely fastened to their bottoms, while the upper ends and caps n of the supports extend up through the cups b^2 , the whole adapted to receive the water from the ice-pipes
55 and to sustain the columns of ice in the same, substantially as described.

7. In combination with the described reservoirs, the waste-pan R, having side and end flanges, and having its bottom elevated about
60 midway of its length, and the ends thereof depressed, and having the channels t^2 , leading to holes t^3 , near each end of the bottom, adapted to conduct off the water from the reservoirs, substantially as described. 65

8. In a refrigerator-car, a refrigerating apparatus consisting of refrigerating-chambers at each end, formed in part by division-doors extending across the car, a series of cooling-pipes in said chambers, reservoirs below and
70 communicating with each series of cooling-pipes, air-tubes extending upward from each reservoir, and an upwardly-inclined perforated pipe communicating with said air-tubes for conveying cold air through the body of
75 the car and carrying off the water of condensation, substantially as described.

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Witnesses:

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