

(No Model.)

H. C. JOHNSON.
REFRIGERATOR CAR.

No. 328,684.

Patented Oct. 20, 1885.

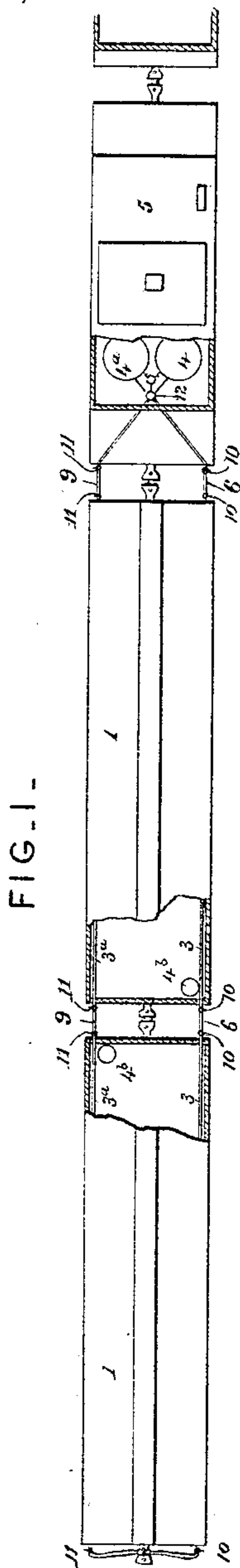
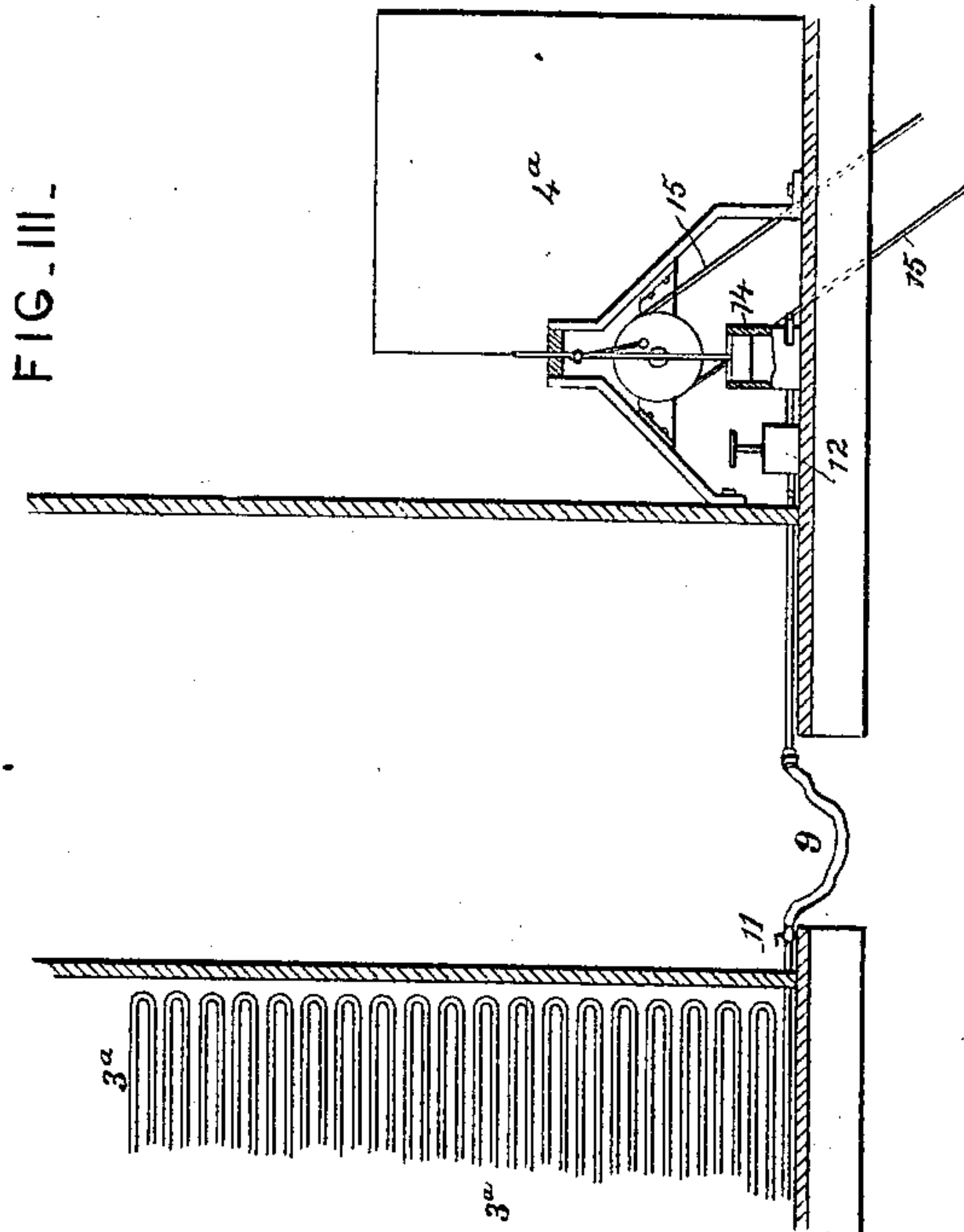
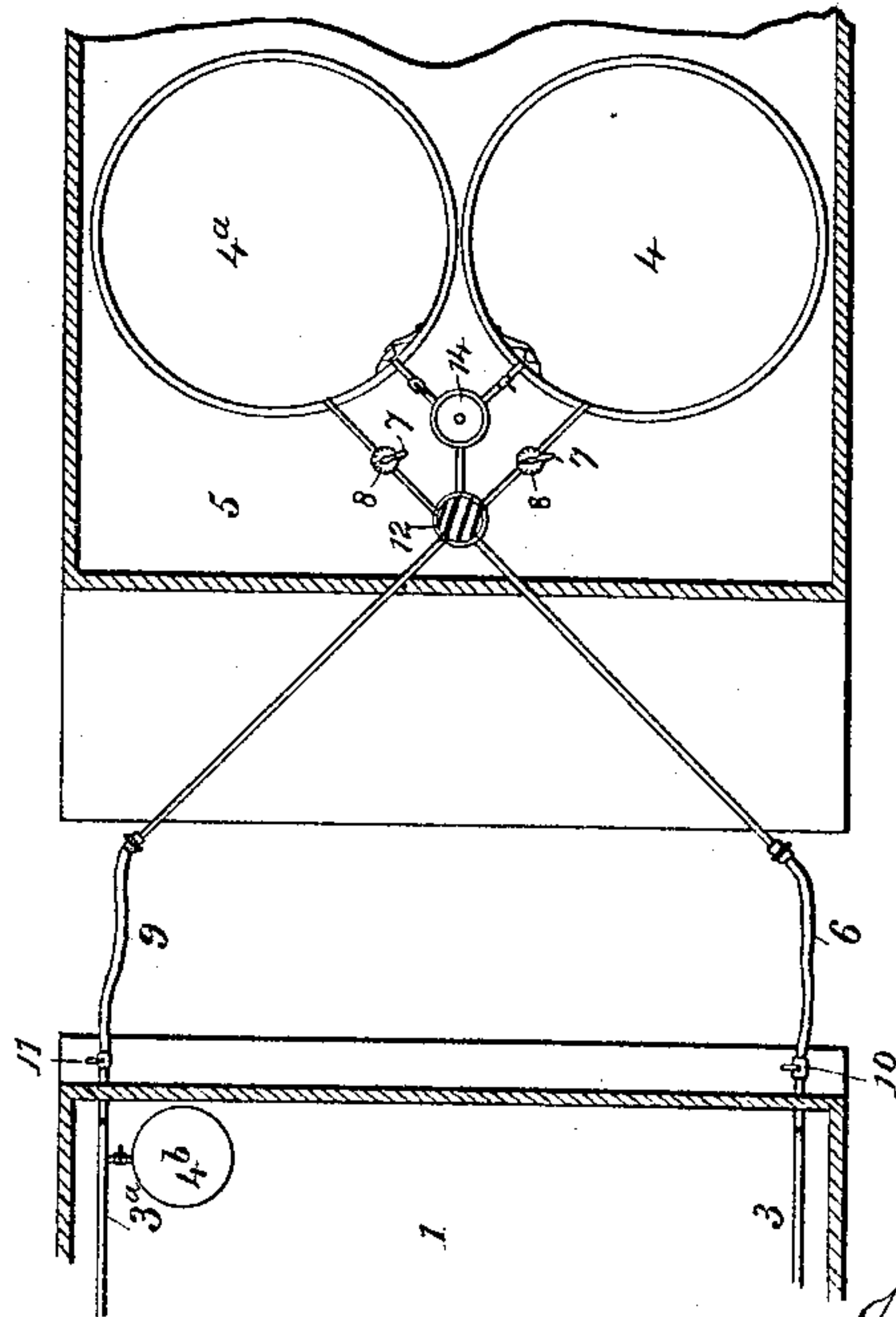


FIG. II.-



Attest:
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UNITED STATES PATENT OFFICE.

HENRY C. JOHNSON, OF MEADVILLE, PENNSYLVANIA.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 328,684, dated October 20, 1885.

Application filed January 29, 1885. Serial No. 154,321. (No model.)

To all whom it may concern:

Be it known that I, HENRY CLAY JOHNSON, a citizen of the United States, residing at Meadville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Refrigerator-Cars, of which the following is a specification.

The subject of my invention is a refrigerator-car provided with a cooling-conduit for use with ammonia, compressed carbonic-acid gas, or other cooling medium, and so constructed that any desired number of such cars may be used together in a train, the cooling medium being supplied to all the cars from one gas holder or condenser and circulated throughout the entire train, as hereinafter described.

In the accompanying drawings, Figure I is a plan, partly in section, showing the two ends of a railway-train illustrating the invention. Fig. II is a horizontal section of the car containing the generator or gas-holder and a portion of one of the freight-cars on a larger scale. Fig. III is a vertical longitudinal section of the same, also on a larger scale.

The freight-cars 1 are constructed in any usual or suitable manner, with doors at the sides or ends or in the top, as may be preferred. The refrigerating or cooling conduit may be of any desired form—as, for example, flat chambers or boxes connected together—but I prefer to make it in separate coils of pipe 3 3^a on opposite sides of the respective cars, or preferably at the top, in such a manner as not to obstruct the doors, and is exposed to the interior chamber of the cars in which the merchandise is contained. The holder or condenser from which the cooling medium is supplied is shown at 4 contained in a separate car, 5, and provided with a valve, 7, the opening of which is regulated with accuracy by means of a dial-indicator, 8. Couplings 6 are provided between the gas-holder 4 and the cooling-conduit 3 of the first car, and between this and the cooling-conduits of the following cars, as shown in Fig. I, on one side of the train, similar couplings, 9, being provided between the cooling-conduits 3^a on the other side for the flow of the gas in the opposite direction. The coupling 9 at the forward end of the front car connects the cooling-conduit 3^a and a second holder or con-

denser, 4^a, through the medium of an air-pump, 14, driven by a belt, 15, from the car-axle or from any suitable motor, so as to produce an exhaust in the return-conduit 3^a, and condense the gas in the second holder 4^a, where it is cooled for subsequent use by radiation assisted artificially, if desired.

The conduits 3 3^a are provided at their extremities with simple cocks 10 and 11 by which the cooling medium may be imprisoned between the cooling-conduits of any particular car or of any numbers of cars, when uncoupled from the gas-holders.

It will be apparent from the above description that I am enabled to produce a complete circulation of cooling medium from end to end of the train, aided by the exhaust action of the air-pump 14, by which the gas is condensed in the holder 4^a for future use; and in order to permit the repeated use of the gas as many times as desired, I reverse the action, returning it from the holder 4^a to the holder 4, and vice versa, as the holders are successively depleted. In order that a single air-pump may be used for the purpose of producing the exhaust in the required direction, I provide a five-way cock, 12, which is turned in either direction to cause the air-pump to exhaust the gas from the conduit 3 and force it into the holder 4^a, or to exhaust it from the conduit 3^a and force it into the holder 4, each of the gas-holders 4 4^a being provided with a valve, 7, and dial-indicator 8, to accurately regulate the discharge of gas from the holder from which the supply is furnished for the time being.

Each car is supplied with a separate portable gas-holder, 4^b, which may be coupled to one or both of the cooling-conduits, as illustrated in Fig. II, in the event of the car being derailed or switched off for any reason, and the cargo in this way preserved. These separate gas-holders 4^b are not required to be used in the proper operation of the apparatus throughout an entire train; but I thus provide for any emergency which may arise in any one or more of the cars in the event of accident to the machine, car, or caboose, or any other car of the train.

For convenience of description I have referred to the gas-holders and their accessories as located at the forward end of the train. It

is evident that this is not material to the invention. The said appliances may, if preferred, be located at the rear of the train or in any intermediate position with like effect.

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

1. A refrigerating apparatus consisting of cooling-conduits 3 3^a, couplings 6 9, and gas-
10 holders 4 4^a, adapted to produce a continuous circulation throughout a train of cars, as and for the purpose herein described.

2. The combination of the gas-holders 4 4^a,

cooling-conduits 3 3^a, couplings 6 9, and air-pump 14, for producing a cooling circulation 15 throughout a train, as shown and described.

3. The combination of the cooling-conduits 3 3^a, gas-holders 4 4^a, regulating-valves 7, five-way cock 12, and air-pump 14, for producing an exhaust in either conduit and recondensing 20 the gas.

HENRY C. JOHNSON.

Witnesses:

HENRY A. LOCKWOOD,
ALBERT MILLER.