

No. 625,439.

Patented May 23, 1899.

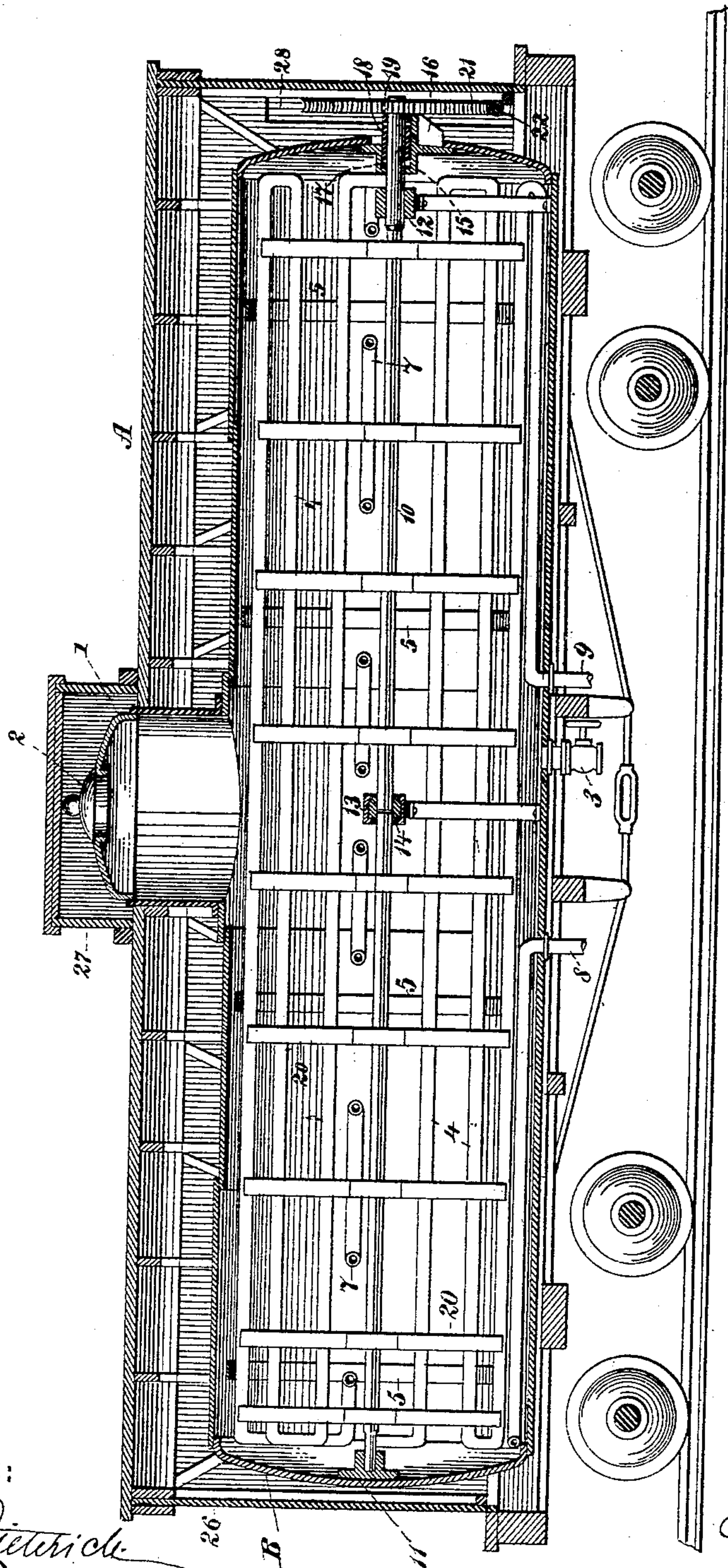
C. EFROS.
REFRIGERATOR TANK CAR.

(Application filed Oct. 30, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

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2 Sheets—Sheet 2.

Fig. 2.

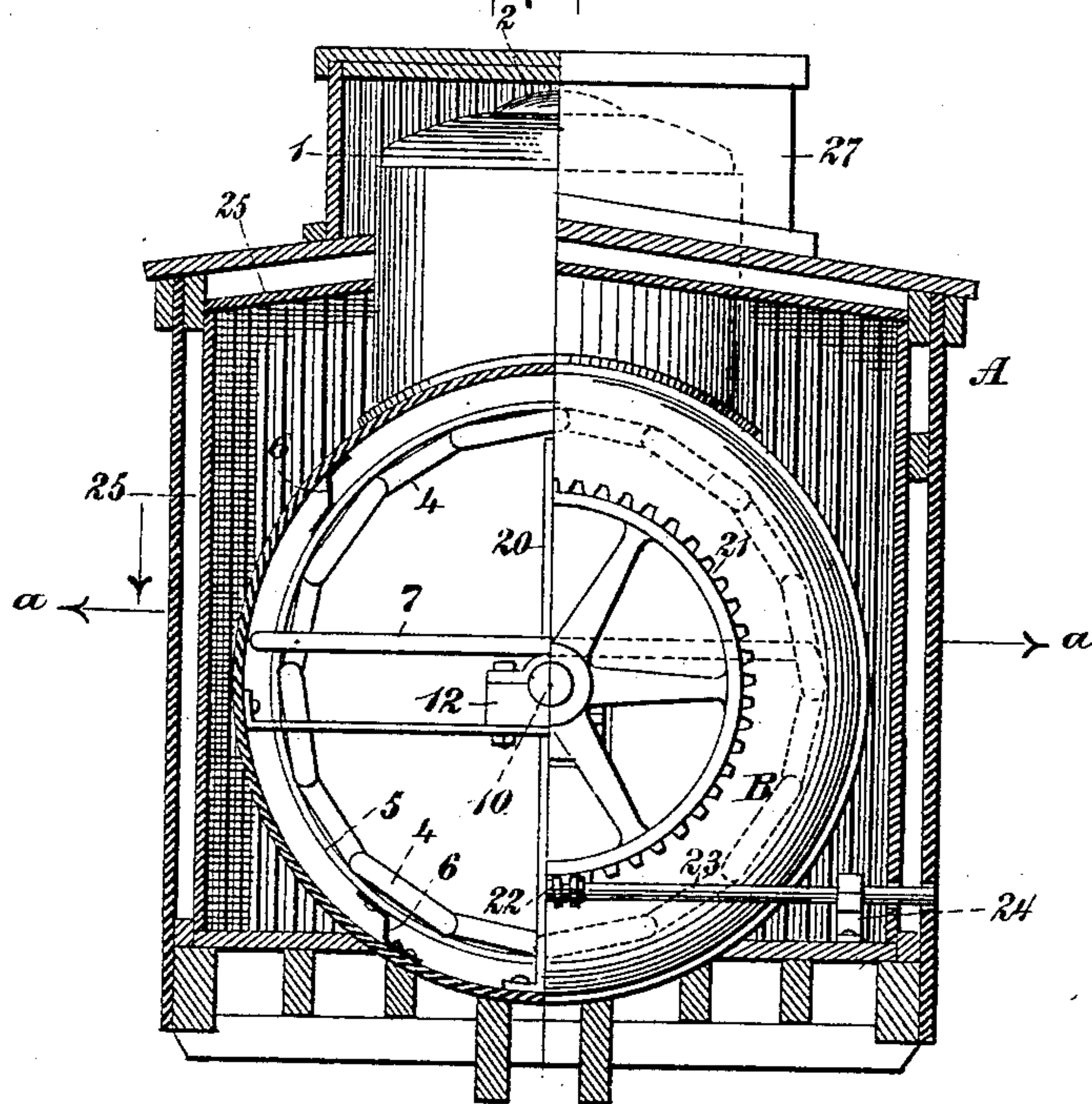
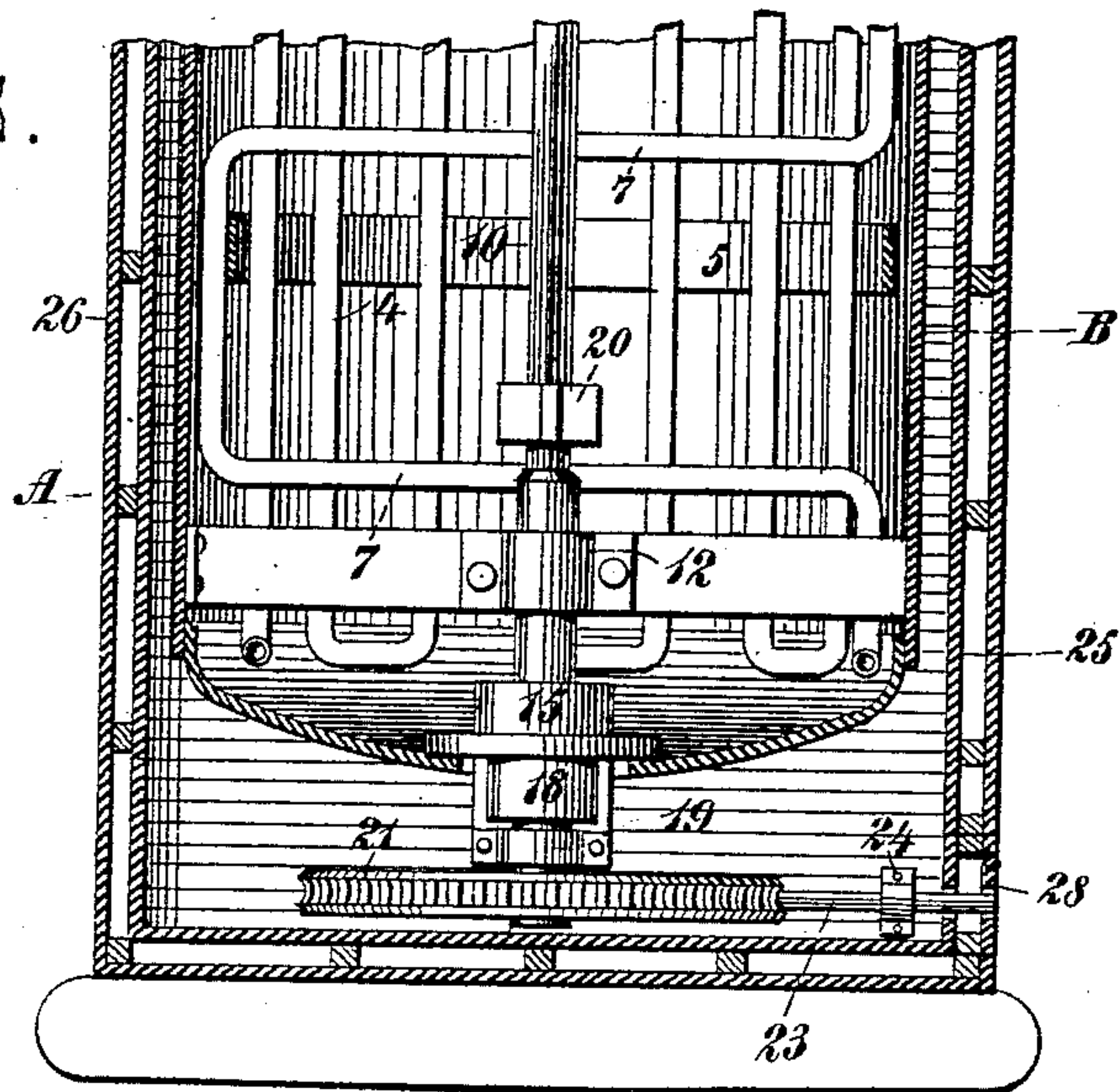


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES EFROS, OF FANWOOD, NEW JERSEY, ASSIGNOR TO THE CHARLES EFROS COMPANY, OF NEW JERSEY.

REFRIGERATOR-TANK CAR.

SPECIFICATION forming part of Letters Patent No. 625,439, dated May 23, 1899.

Application filed October 30, 1897. Serial No. 656,870. (No model.)

To all whom it may concern:

Be it known that I, CHARLES EFROS, a citizen of the United States, residing at Fanwood, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Refrigerator-Tank Cars, of which the following is a specification.

My invention relates to tank-cars, and has for its object to produce a means for transporting fluids and treating the same while in the tank-car.

To this end my invention consists in the special matters pointed out in the claims.

My invention will be understood by referring to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a car embodying my invention. Fig. 2 is an end view, partly broken away and in section; and Fig. 3 is a broken-away plan section of the same.

Before describing my invention I will say that the object for which it was devised was to enable me to run fluid into the tank, to freeze the said fluid while in the tank, to transport it in such congealed condition, and thaw it out when it reaches the end of the journey, it being readily understood that a freezing mixture is run through the pipes when freezing is to be accomplished and a thawing mixture is run through the pipes when thawing is to be accomplished.

In the drawings, A indicates the box or body of a car, and B a tank of ordinary construction contained within the car. The tank is preferably cylindrical and placed with its axis horizontal, as shown; but the invention may be employed with other forms of tanks. On top of the tank is a dome 1, provided with a filling-opening, which is closed by a cap 2, and beneath the tank is a valve 3, through which the contents of the tank may be discharged.

To cool or warm the contents of the tank, I provide a series of coils 4, supported on rings 5, said rings being carried by brackets 6, attached to the tank. The coils 4 are thus arranged in a circular series adjacent to the wall of the tank. Another series of coils 7 run back and forth across the tank horizontally in order to heat the middle portion of

the contents. As shown, these coils are continuous and the heating or cooling fluid passes into one end 8 of the system and out through the other end 9.

A shaft 10, preferably angular in cross-section, but round at ends, extends centrally through the tank. At one end it is supported in a bearing 11 and at the opposite end in a bearing 12. A central bearing 13 is also preferably provided. As shown, there is a journal 14, running in the bearing 13, and the shaft, which is made in two sections, is fitted into said journal. Additional bearings may be provided, if necessary. One end of the shaft passes through a stuffing-box 15, which is preferably integral with a bracket 16, attached to the end of the tank. The stuffing-box is provided with suitable packing 17 and a gland 18. An additional bearing 19 is also provided for the outer end of the shaft, said bearing resting on the bracket 16. At suitable intervals paddles 20 are connected to the shaft, the function of the paddles being to stir and circulate the contents of the tank. These paddles may be of any suitable form and material. These paddles are preferably located between the adjacent portions of coils or pipes 7, as shown.

Suitable means are provided for applying power to the shaft to rotate the same. This may be accomplished by mounting a gear, pulley, or sprocket wheel on the end of the shaft and arranging to turn the same from a source of power outside the car. As shown, a worm-wheel 21 is connected to the shaft and in mesh with the worm 22 upon the inner end of a shaft 23, which is carried in suitable bearings 24. The end of the worm-shaft extends to a small door 28 near the end of the car, which door can be readily removed, if desired, to operate the paddles.

In order to prevent the temperature of the contents from being changed by exposure to the atmosphere, I preferably line the box or body of the car with some non-conducting material. As shown in Figs. 2 and 3, there is a lining 25 in addition to the outer covering 26. The dome may also be covered with a housing 27, as shown in Fig. 1, to afford additional protection.

The operation will be obvious from the fore-

going description and need only be briefly re-
cited. The car is filled in the usual manner
through the opening in the dome, and fluid,
gas, or air, as the case may be, is circulated
5 through the coils 4 and 7 until the tempera-
ture of the contents of the tank is raised or
lowered to the desired degree. In order to
make the temperature uniform throughout
the mass to prevent overheating or overcool-
10 ing of any portion of it, to prevent sediment
depositing in the bottom, and for other rea-
sons, the paddles 20 are operated while the
heating or cooling medium is circulating in
the coils. As soon as the temperature has
15 reached the desired degree the door 28 is
closed, thus sealing the car, and the coils are
emptied. If the car be kept closed, the tem-
perature in the tank will change very slowly
and the material may be transported a long
20 distance without material change of tempera-
ture.

Having described my invention, what I
claim, and desire to secure by Letters Patent,
is—

25 1. The combination of a car having a closed
box or body, a tank within said box, coils
within and adjacent to the wall of the tank,

additional coils arranged transversely in the
middle of the tank, a shaft mounted in bear-
ings within the tank and extending through 30
a stuffing-box in the end of the tank, paddles
upon the shaft within the tank and suitable
means connected to the projecting end of the
shaft for turning the same, substantially as
described.

2. The combination of a car, a tank carried 35
thereon, coils within the said tank adjacent
to the wall of the tank and arranged to carry
fluid through the car in a continuous flow, ad-
ditional coils arranged transversely in the 40
middle of the tank likewise arranged to carry
fluid, a shaft mounted in the tank projecting
through the side thereof and provided with
stirrers or paddles intermediate of the addi-
tional coils and means engaging with the shaft 45
for rotating the same, whereby the contents
of the tank may be cooled or thawed by the
fluid flowing in the coils, which operation will
be facilitated by the stirring.

CHARLES EFROS.

Witnesses:

GEO. E. MORSE,
CHARLES E. SMITH.