

(No Model.)

2 Sheets—Sheet 1.

C. M. SMITH.

CAR HEATER.

No. 366,517.

Patented July 12, 1887.

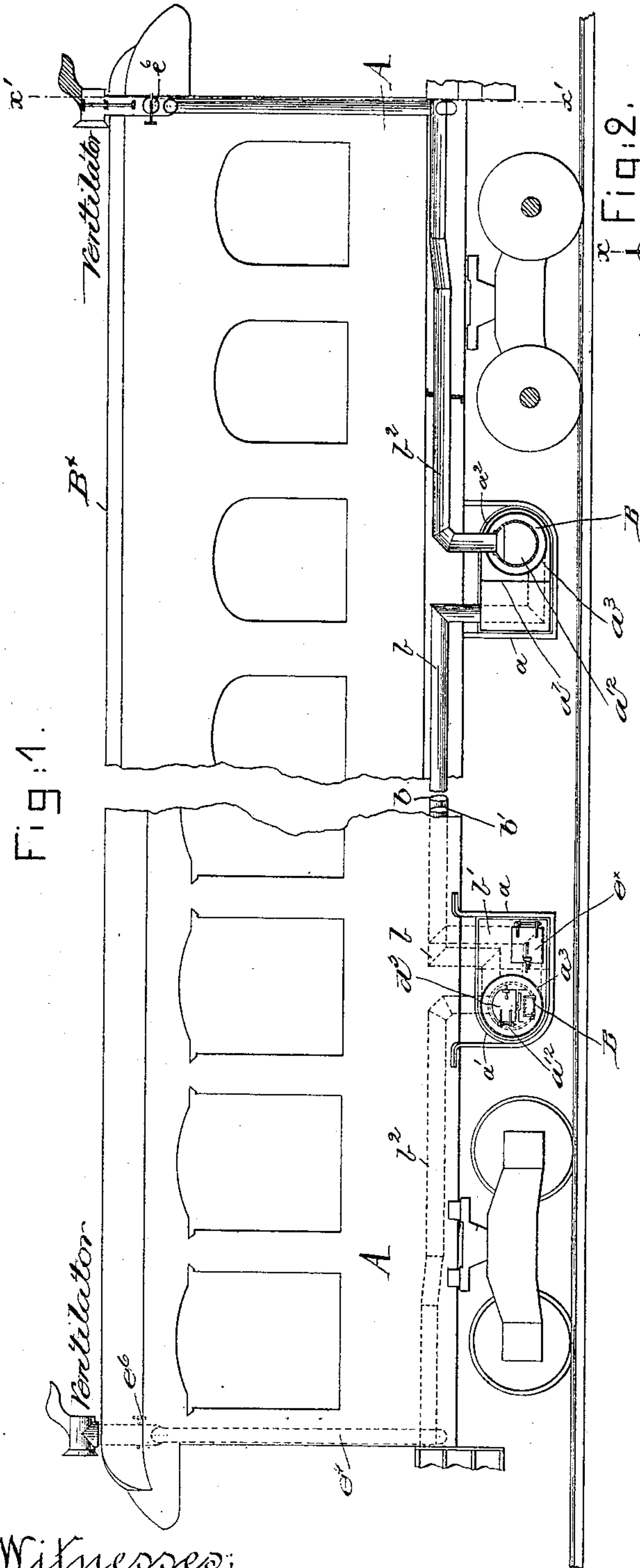


Fig: 2.

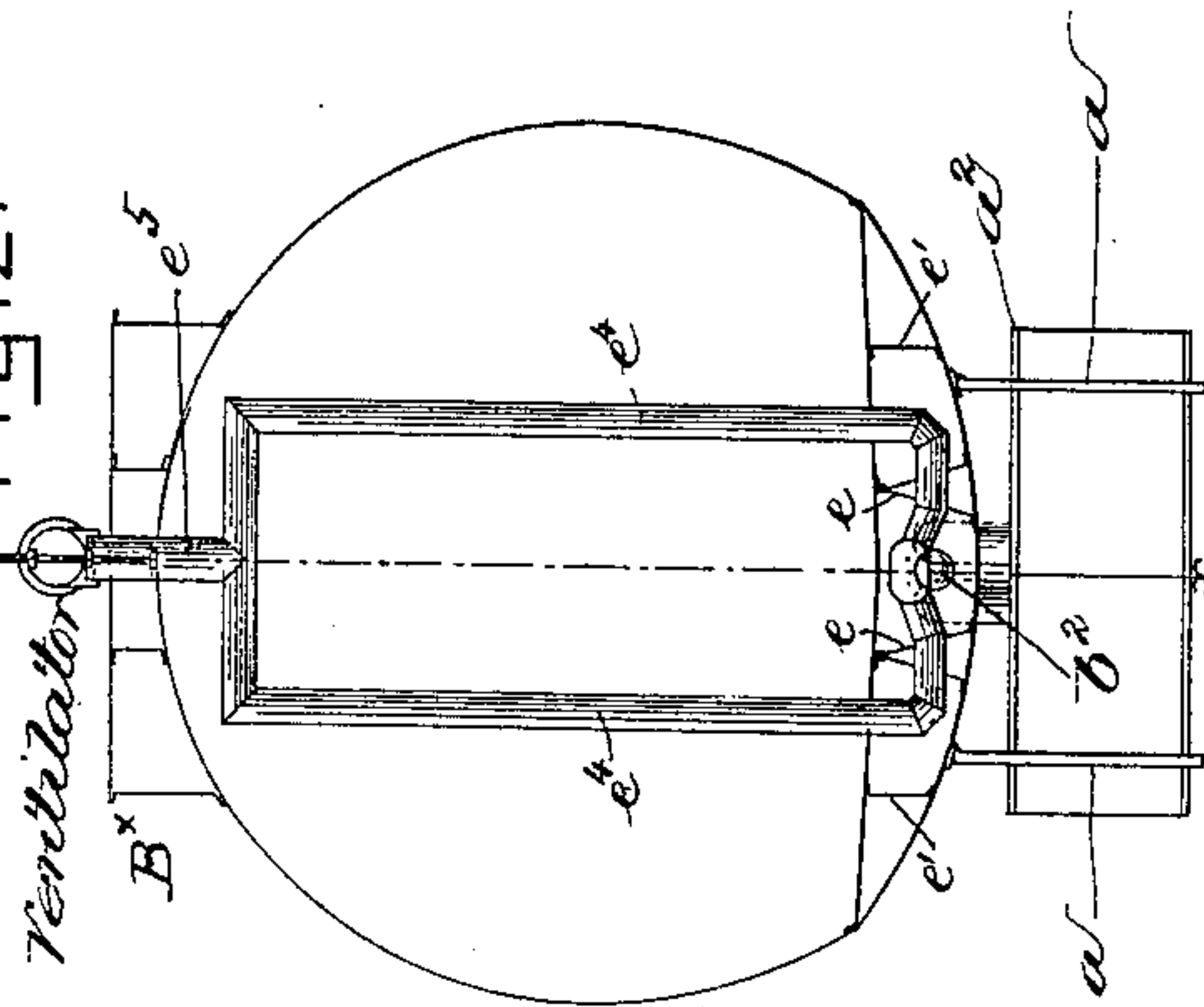
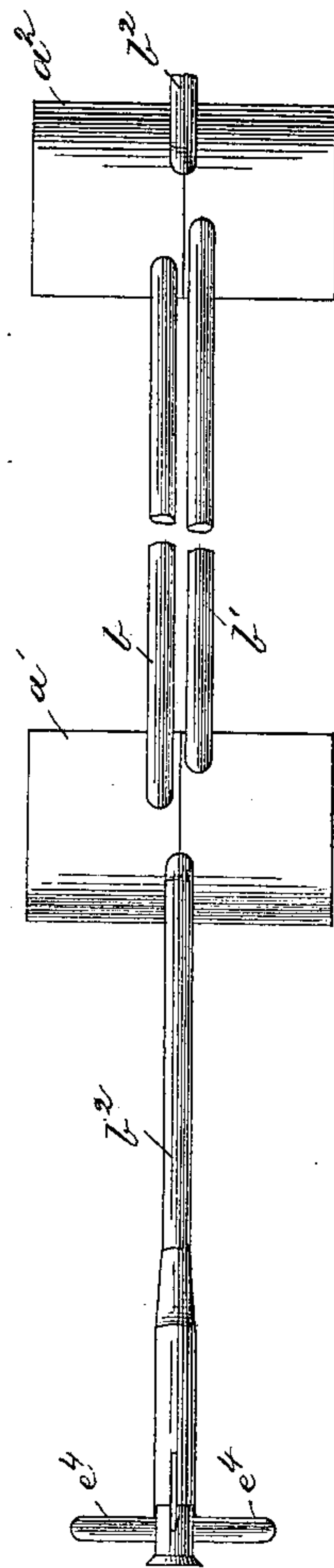


Fig: 3.



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(No Model.)

2 Sheets—Sheet 2.

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Fig: 4.

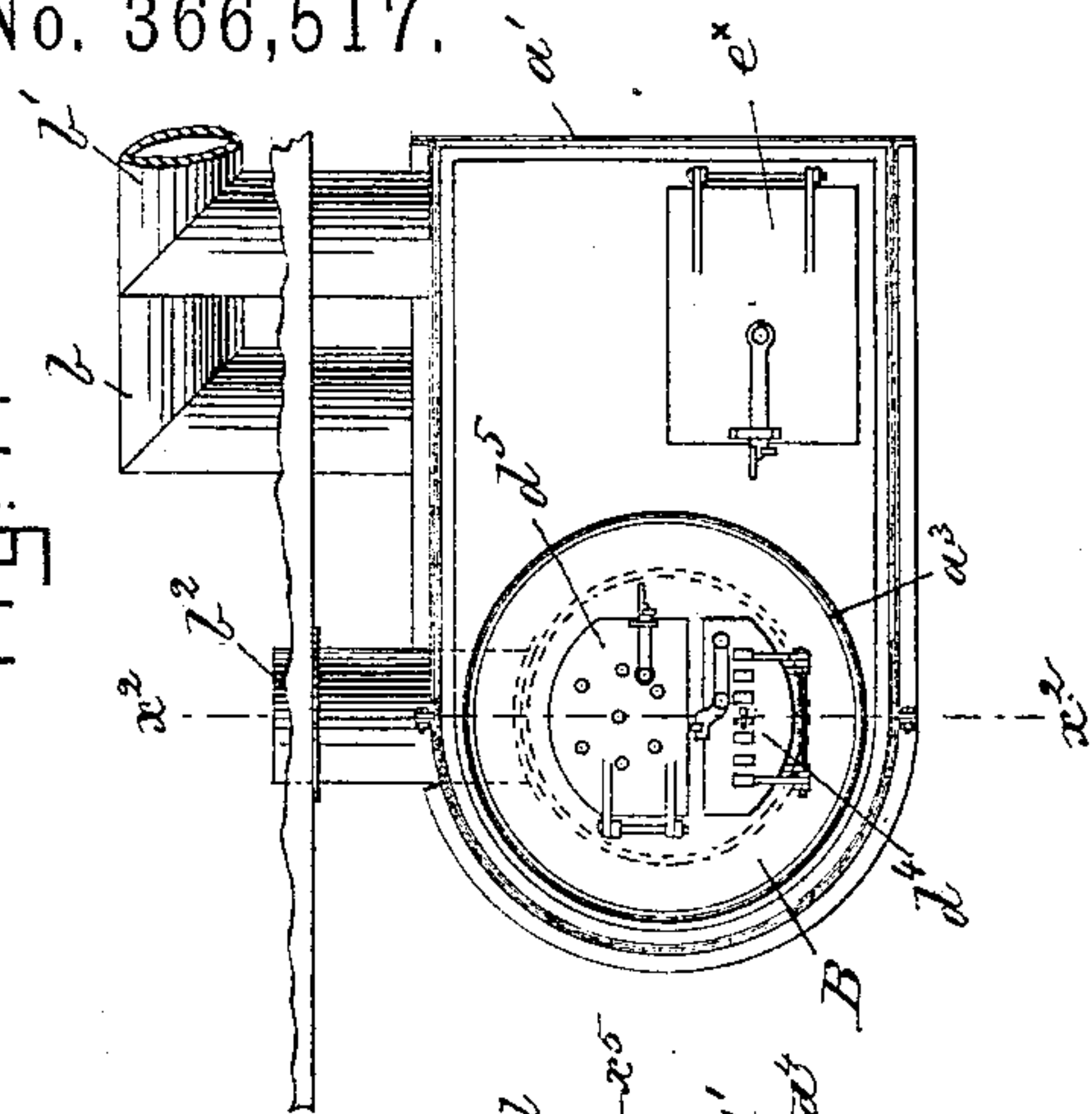


Fig: 5.

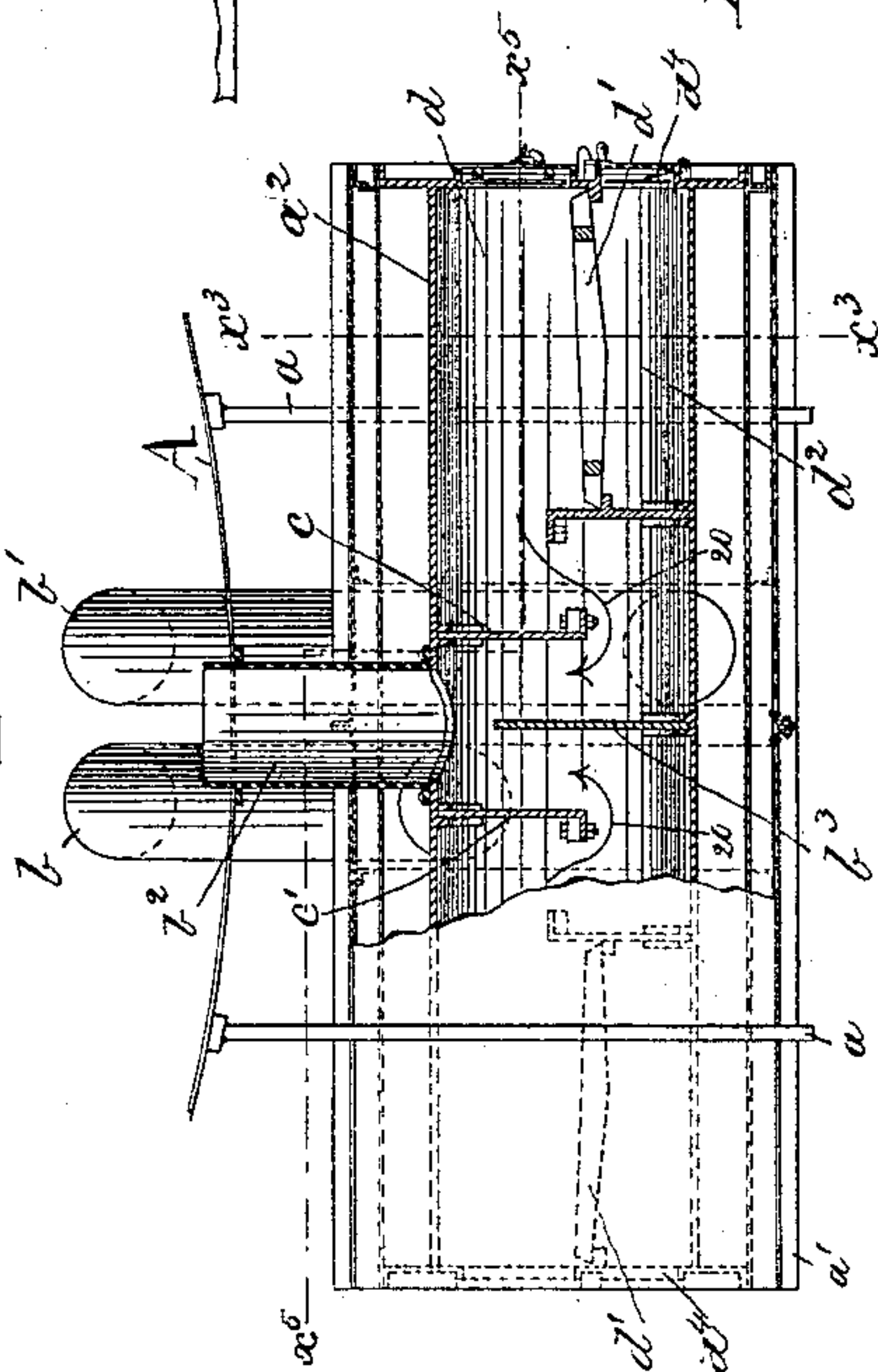


Fig: 6.

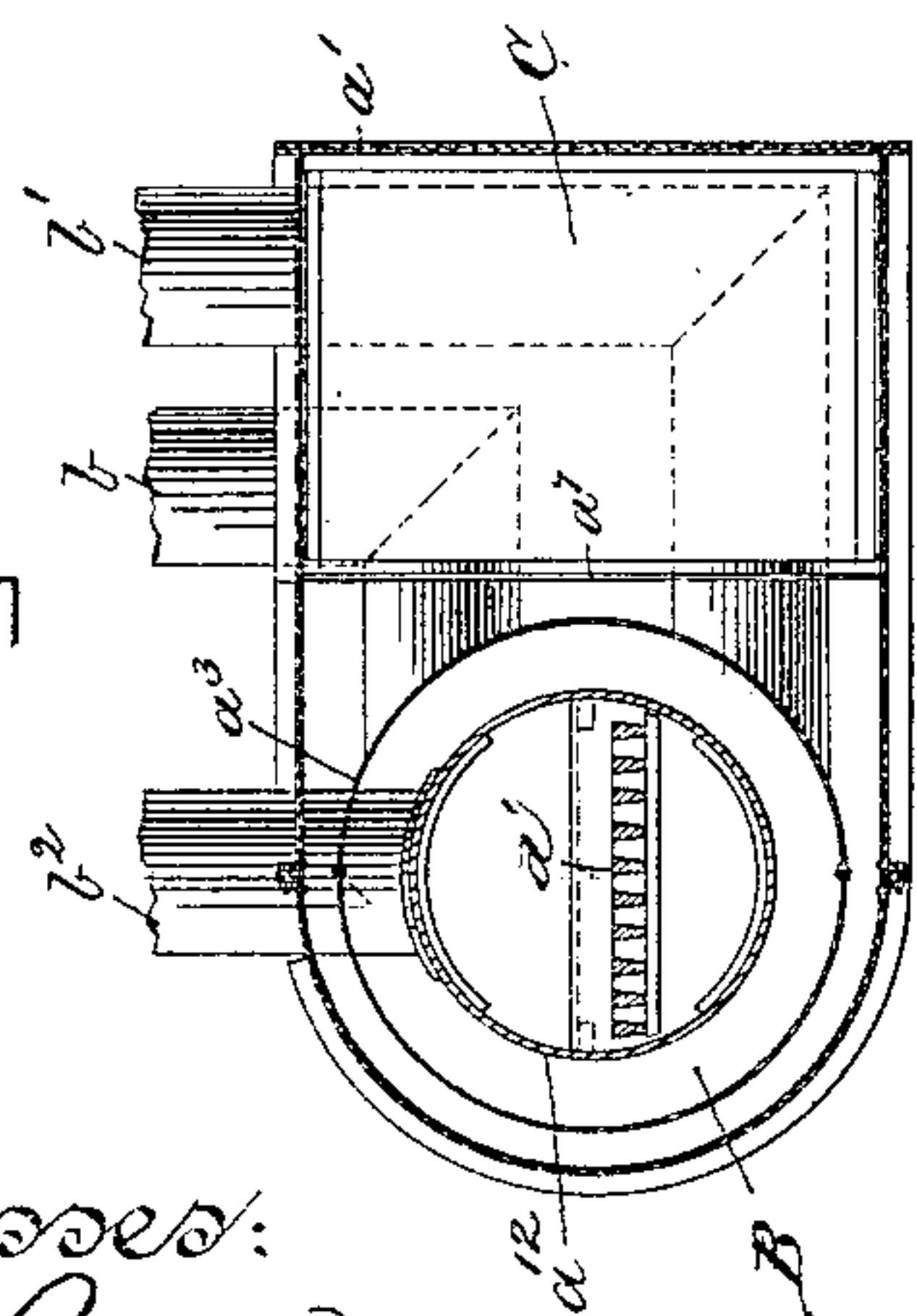
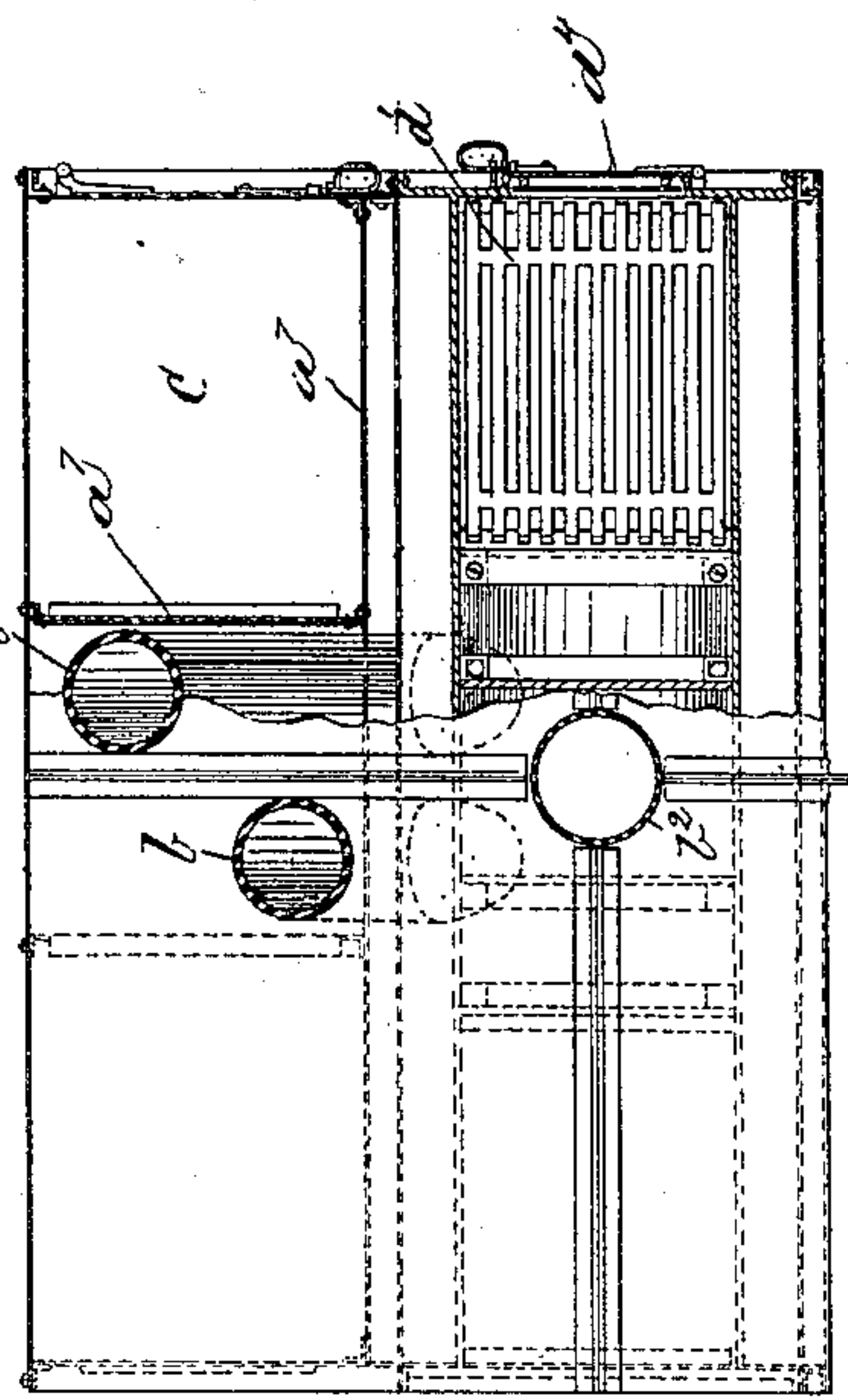


Fig: 7.



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UNITED STATES PATENT OFFICE.

CHARLES M. SMITH, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LEWIS J. BIRD, TRUSTEE, OF SAME PLACE.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 366,517, dated July 12, 1887.

Application filed September 10, 1886. Serial No. 213,237. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. SMITH, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Heating Cars, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Application, Serial No. 180,949, filed October 26, 1885, shows and describes a railway-car having its body composed of metal plates riveted together, the floor of the car being supported upon keelsons above the lower part of the car-body to form a space below the said floor for the circulation of air into the car.

This present invention has for its object to provide cars of the class referred to with heating apparatus, as will be described, whereby the air passing into the interior of the car may be heated before entering therein through suitable registers in the floor of the car.

In accordance with my invention, there is provided below the car-body one or more air-compartments provided each with one or more air inlet and outlet pipes, the said air-pipes being connected, as will be described, so as to permit of a continuous circulation of heated air through them, the air in the said compartments being heated by a furnace, (preferably one for each air-compartment,) the said furnace being surrounded by the said air-compartment.

My invention consists in the construction of car-heating apparatus, hereinafter particularly set forth and claimed.

Figure 1 in side elevation shows a passenger-car of the class referred to provided with my improved heating apparatus, one side and the central part of the car being broken away in the line $x x$ of Fig. 2; Fig. 2, a view in elevation and section of Fig. 1 looking toward the left, the section being on line $x' x'$; Fig. 3, a partial plan view of the heating apparatus detached, some of the pipes being broken out; Fig. 4, a front elevation of one of the furnaces removed; Fig. 5, a partial section and side elevation of Fig. 4, the section being on line $x^2 x^2$; Fig. 6, a section of Fig. 5 on line $x^3 x^3$; and Fig. 7, a plan and sectional view of Fig.

5, with part of the top broken off, the section being on line $x^5 x^5$ of Fig. 5.

The car-body A, composed of numerous sheets or plates of metal riveted together and provided with a monitor top, B^x, and having its floor supported on keelsons $e e'$, (see Fig. 2,) forming the bottom of the car-body, is substantially such as shown in the application above referred to. As herein shown, the car-body A has suspended from it by straps a two shells or cases, $a' a^2$. (See Fig. 1.) Each shell or case contains within it a tube or shell, a^3 , having air-pipes $b b'$ connected to it, the said tube or shell a^3 inclosing within it a preferably cylindrical furnace, a^{12} , having an outlet-pipe, b^2 , extended up through the tube or shell a^3 , the said shell a^3 thus forming an air jacket or compartment, B, around each furnace a^{12} . The outlet-pipe b^2 for each furnace is preferably located near the longitudinal center thereof, (see Figs. 3 and 5,) and the said furnace is divided centrally, as shown in Fig. 5, by a division-plate, b^3 , secured, as herein shown, to the lower part thereof, the said plate being extended upward to near the top of the said furnace.

To the top of the furnace a^{12} and at opposite sides of the pipe b^2 are secured plates $c c'$, the said plates being projected downward into the furnace a^{12} , and being extended beyond the top of the plate b^3 , as clearly shown in Fig. 5.

At each end of the furnace a^{12} is a fire-chamber, d , provided with a fire-grate, d' , supported above the bottom of the said furnace to form an ash-pit, d^2 , accessible by a door, d^4 , the fire-chamber d having the usual door, d^3 . Each shell or case $a' a^2$ is herein shown as divided longitudinally by a plate, a^7 , (see Fig. 6,) to form a coal or other fuel-bunker, C, each bunker having a door, e^x , as shown in Fig. 4.

The pipe b^2 affords an outlet for the products of combustion coming from both chambers d , the said products of combustion passing from each end of the furnace a^{12} toward the center thereof, and passing therefrom, as indicated by arrows 20, Fig. 5. The pipe b^2 of each furnace a^{12} is carried below the car-floor toward one end thereof, (see Fig. 1,) where it is joined to branch pipes e^4 , (see Fig. 2,)

passed up toward the roof of the car at the side of the usual door in the end of the car, the said branch pipes being joined above the said door to a single pipe, e^5 , provided with a
5 suitable damper, e^6 .

The pipes b b' at their opposite ends pass through the shells or cases a' a^2 and enter the shells a^3 , they thus being placed in communication with the air-compartment B, the pipe
10 b' being connected to the lower side of the compartment B, (see Fig. 6 and left of Fig. 1,) inclosed within the case a' , and to the upper side of the like compartment B in the case or shell a^2 , as at right of Fig. 1. The pipe b is
15 inversely connected, as will be seen from the drawings, so that when the said pipes and the cases a' a^2 and parts contained therein are placed in position beneath the car air is inclosed within each jacket or compartment
20 B and the pipes b b' .

When it is desired to warm or moderately heat the air which enters the car, a fire is started in one or both chambers d of each furnace a^{12} , the fire in each furnace heating the
25 air in its surrounding jacket or compartment B. As the air in each compartment B is heated, it rises and finds an outlet through the pipe b or b' , attached to its upper part. The heated air in the compartment B contained in
30 the case a' is conducted from the said compartment by the pipe b , carried beneath the car-floor, while the heated air in the compartment or jacket contained in the case a^2 is conducted therefrom by the pipe b' , the said heated
35 air imparting some of its heat to the cooler atmospheric air circulating around the said pipes below the car-floor, so that the said atmospheric air is of a considerably higher temperature when it enters the car. The air
40 passing through the pipe b enters the air-compartment B contained in the case a^2 near the bottom of said compartment, the said air on its passage from one air-compartment to the other being deprived of the greater part of its
45 heat.

By the arrangement of pipes, as described, a continued circulation of heated air is maintained below the car-floor between the air-compartments as long as heat is maintained
50 in either furnace.

As shown in Fig. 1, the pipes b^2 of each furnace serve to heat the air toward the ends of the car.

I have herein shown (see Fig. 5) the furnaces a^{12} as provided with two fire-chambers,
55 and in practice either one or both fire-chambers may be used.

It may be desirable to dispense with one of the furnaces and employ but a single furnace enveloped by an air-compartment, the said
60 air-compartment being connected, as described, with an air-compartment separate from a furnace and constituting an air-reservoir; or the said reservoir may be dispensed
65 with, and the pipes leading from the air-compartment be joined at their remote ends, the heat from the said furnace causing circulation of heated air through the said pipes.

I do not broadly claim apparatus for heating cars comprising a false bottom for the car
70 forming a heating-chamber opening into the interior of the car and combined with a furnace or stove or other heating agent connected with this false bottom; nor do I broadly
75 claim a furnace having two fire-chambers and a smoke-flue common to both; nor do I broadly claim a furnace having a surrounding air space or chamber; and, finally, I do not
80 claim car-heating apparatus provided with a chamber containing a heating apparatus at one end and a coal-bunker at the other.

I claim—

1. A railway-car having its floor raised above and supported from the bottom of the car-body and opening into the car, the furnace
85 a^{12} , carried by and beneath the car, and provided with a fire-chamber at each end thereof, the air-compartment B, surrounding each furnace, combined with the pipes b b' , and with the furnace-pipe b^2 , located near the longitudinal center
90 of the furnace and extending to the end of the car and thence opening above the car, substantially as described.

2. A railway-car having its floor raised above and supported from the bottom of the
95 car-body, the furnace a^{12} , carried by and beneath the car, and provided with a fire-chamber, d , at each end thereof, the case a^3 , surrounding the furnace and forming the air-space B, the inclosing-case a' , the pipes b b' ,
100 and furnace-pipe b^2 , combined with the plate a^7 , extended longitudinally through the case a' to form a fuel-bunker, substantially as described.

In testimony whereof I have signed my name
105 to this specification in the presence of two subscribing witnesses.

CHARLES M. SMITH.

Witnesses:

G. W. GREGORY,

JAS. H. CHURCHILL.