

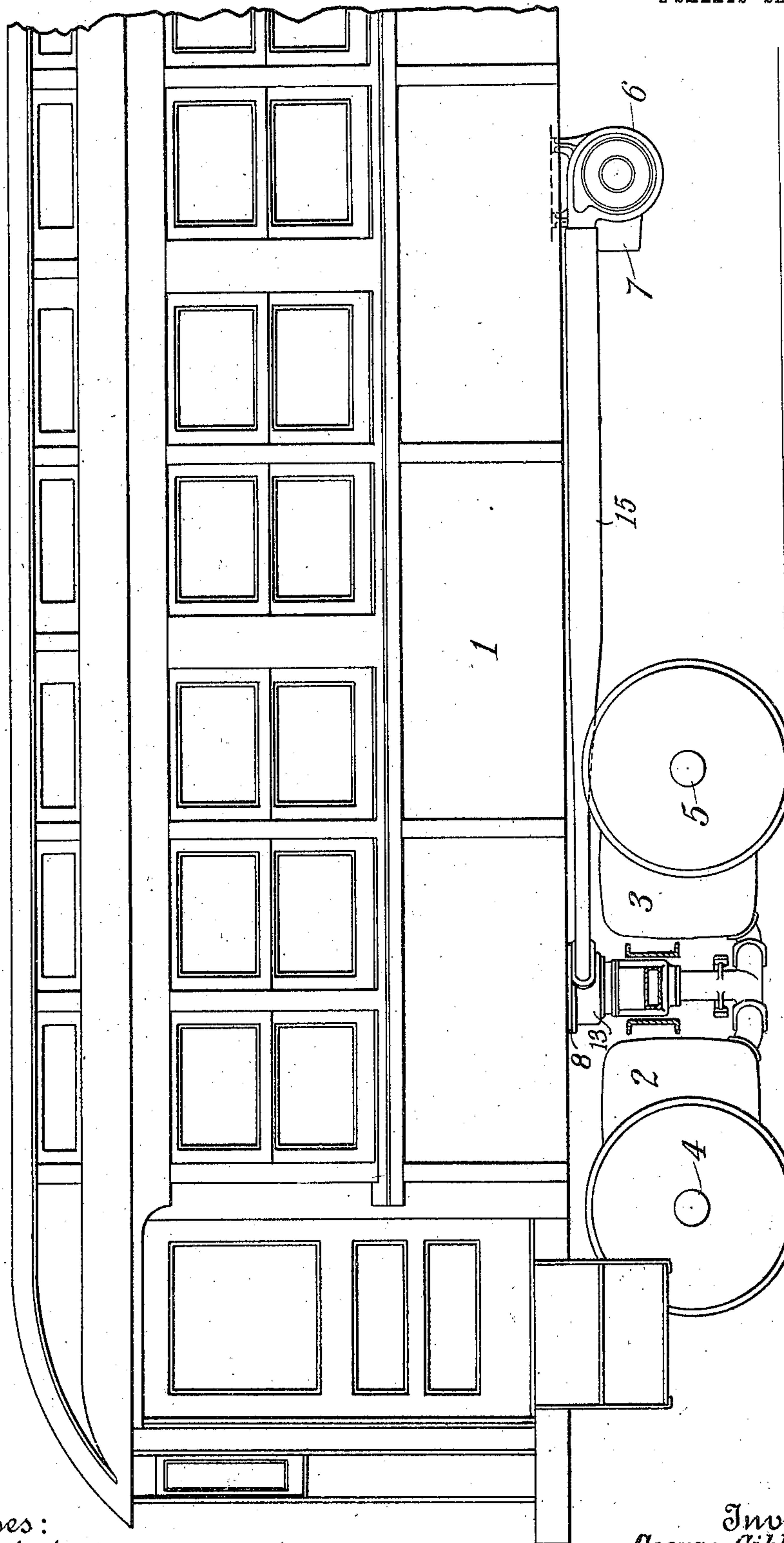
G. GIBBS.

VENTILATION OF ELECTRIC RAILWAY MOTORS.

APPLICATION FILED JULY 24, 1907.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:  
*Raphael Ketter*  
*A. S. Dunham*

Inventor  
 George Gibbs  
 By his Attorneys  
*Kerr, Page & Coopers*

G. GIBBS.

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2 SHEETS—SHEET 2.

Fig. 4

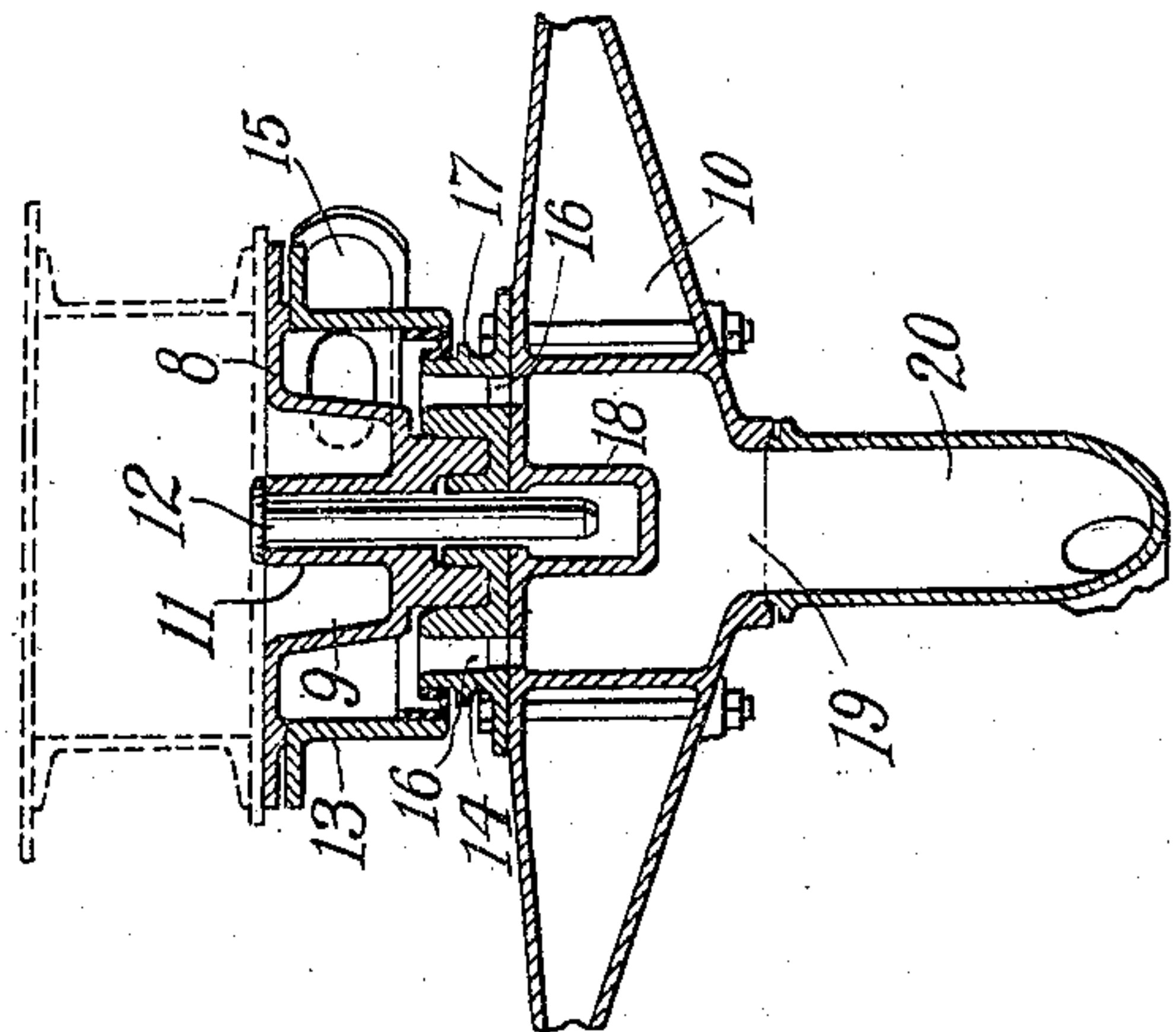


Fig. 2

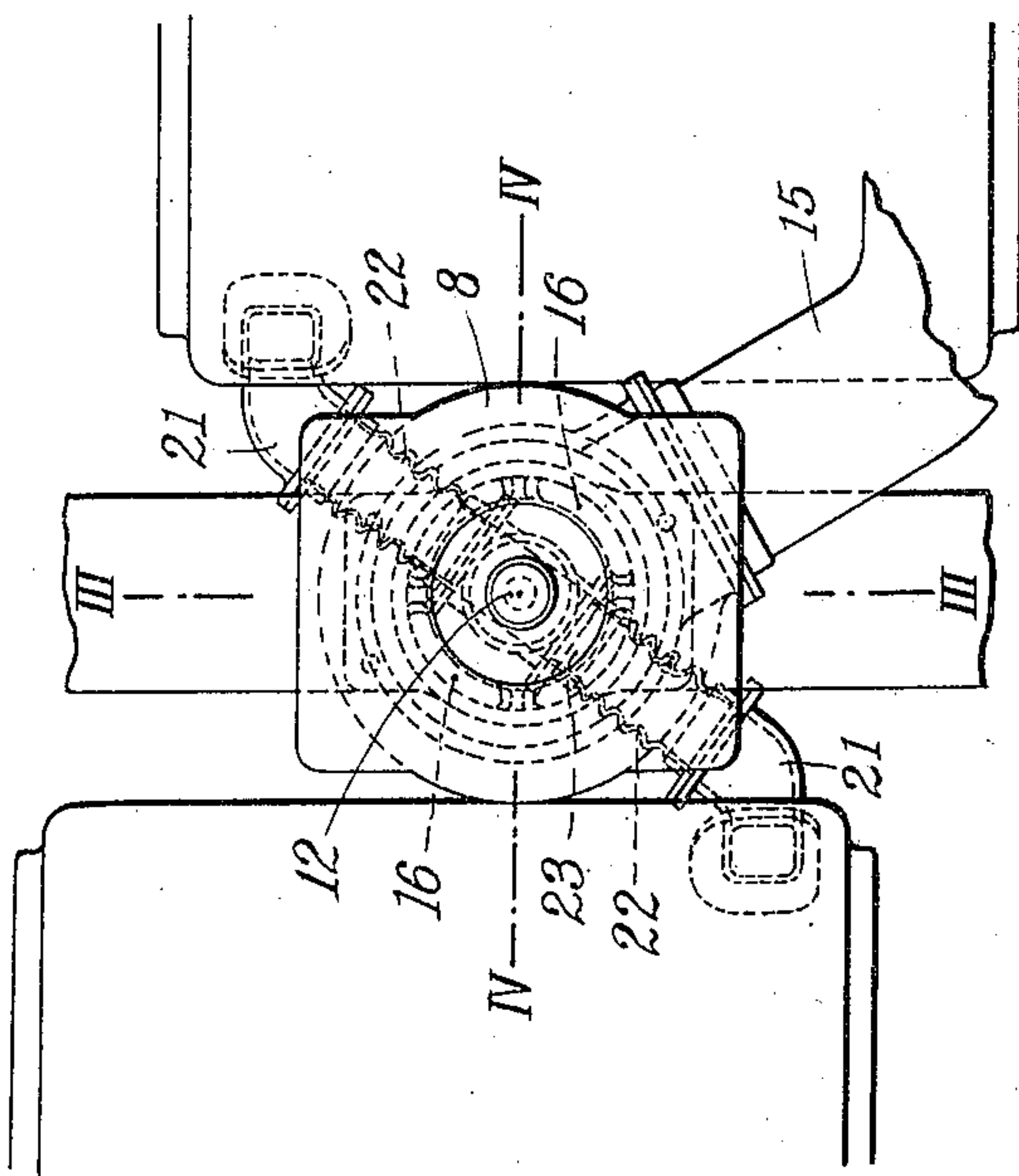
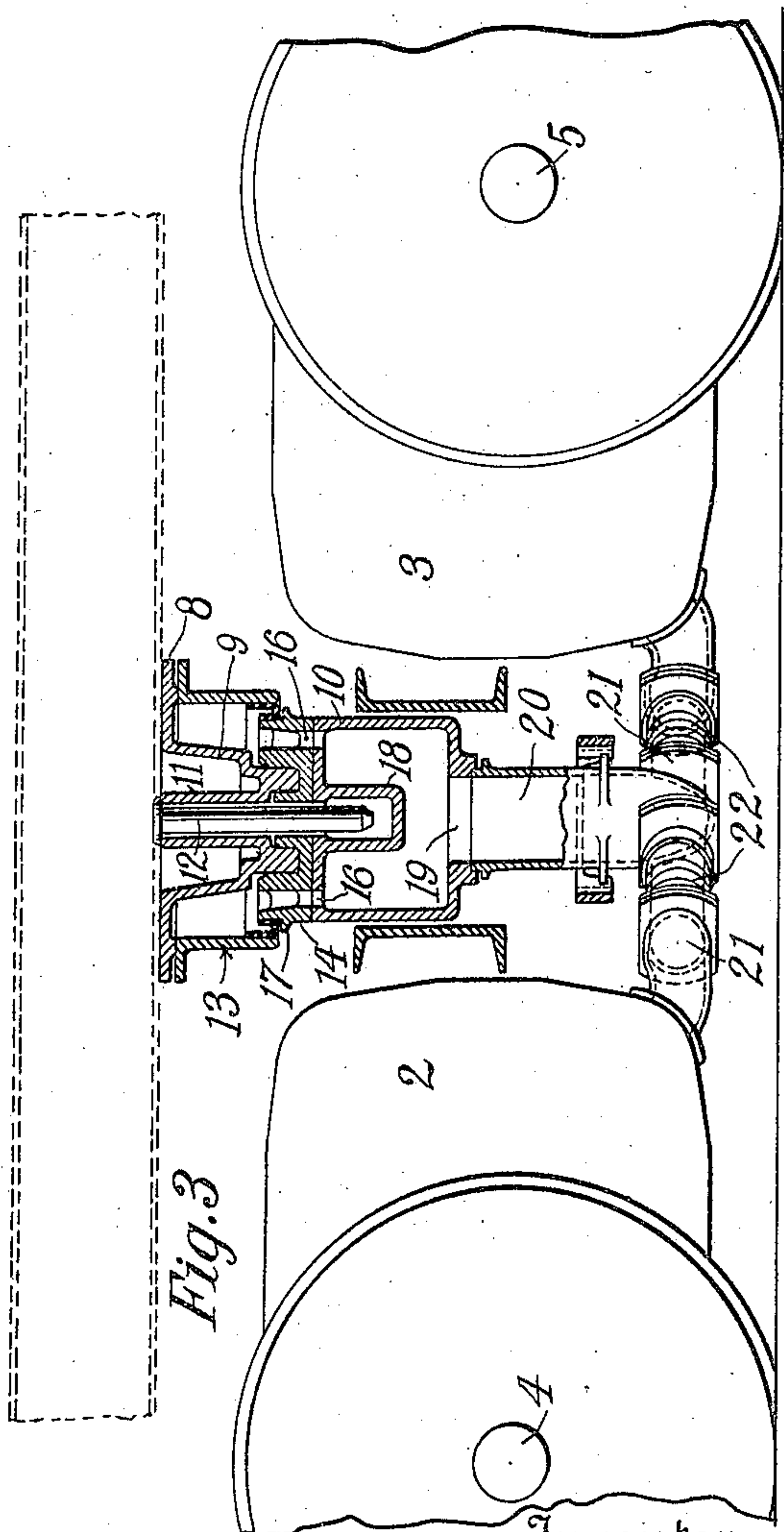


Fig. 3



Witnesses:  
*Raphael Better*  
*S. S. Dunham*

Inventor  
 George Gibbs  
 By his Attorneys  
*Rev. Page & Cooper*



# UNITED STATES PATENT OFFICE.

GEORGE GIBBS, OF NEW YORK, N. Y.

## VENTILATION OF ELECTRIC RAILWAY-MOTORS.

No. 875,061.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed July 24, 1907. Serial No. 385,381

*To all whom it may concern:*

Be it known that I, GEORGE GIBBS, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Ventilation of Electric Railway-Motors, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

My invention relates to the ventilation of electric railway motors, more particularly motors mounted in swivel trucks.

As is well known, one of the difficulties of high-speed electric traction is the danger of overheating the motors. This follows from the fact that by reason of the restricted space available on the car for the motors the latter must be small in proportion to the power which they are required, at times at least, to develop. The result is that the motors are liable to become overheated, with consequent injury. Modern practice in the design of electric motors provides for ventilation thereof, to a limited extent, by a fan action of the motor and by air-ducts in the structure of the motor. But experience has shown that these provisions are not sufficient to keep the motor at a safe temperature in high speed work. I have therefore been led to devise my present invention, which has for its object to provide a simple and effective system for ventilating the motor by directing thereon a blast or current of air, which will absorb and carry away the heat generated in the motor.

To this end the invention consists in the novel features of construction and combinations of elements hereinafter described and more particularly set forth in the claims.

The preferred embodiment of the invention is illustrated in the annexed drawings, in which,

Figure 1 is a side view of one end of a motor car having my invention applied thereto. Fig. 2 is a sectional plan view of a portion of one of the trucks showing the connections and arrangements of the various air passages. Fig. 3 is a section substantially on line III—III of Fig. 2. Fig. 4 is a section substantially on line IV—IV of Fig. 2.

Referring now to the drawings, 1 is the car body, and 2 3 are the customary outer casings of two driving-motors, mounted in the usual way on the axles 4 5 respectively. Suspended from the bottom of the car is a fan or blower 6 of any suitable type, actuated

by a motor 7, connected therewith in any convenient and suitable manner.

8 is the body center-plate on the bottom of the car, provided with a downwardly extending pivot-member 9, the end of which fits a corresponding bearing on the hollow truck bolster 10. Extending vertically within the pivot-member 9 is a central bearing 11, registering with a central aperture in the top of the truck-bolster 10, to receive the usual center pin 12.

Concentric with the pivot member 9 is an annular casing 13, extending preferably below the top of a flange 14 around the bearing, on the truck-bolster, of the pivot member 9. The annular chamber thus formed concentric with the center plate pivot-member is connected with the blower 6 by an air duct 15, so that the current of air from the blower will be delivered into the chamber mentioned.

Inside the flange 14 the top of the truck-bolster is provided with one or more air openings 16, through which the air from the casing 13 passes into the hollow bolster. In order to prevent escape of air between the casing and the flange I prefer to employ a suitable packing or air-seal which will permit the necessary movement of the bolster relative to the casing, instead of trying to make a close fit between the parts themselves. A convenient and effective packing for the purpose is shown in Fig. 3, and consists of a ring of U-shaped cross-section, made of leather, spring-metal, or other suitable resilient material, and interposed between the overlapping portions of the casing 13 and flange 14. This ring yields freely to the motion of the truck and in all positions of the latter fits closely the inner and outer surfaces of the casing and flange respectively, while the effect of the slight air pressure inside the casing is to press the upstanding sides of the ring into closer engagement with their cooperating surfaces. To obviate any possibility of the ring being forced out of position the flange 14 may be provided with an outwardly extending rib 17 below the ring, substantially closing the space between the flange and the casing.

In order to prevent escape of air from the bolster around the center-pin the bolster may be provided with an inner depending cup 18, which incloses the center-pin aperture. Only a negligible amount of air, if any, can escape between the pivot-member 9



and its bearing on the truck-bolster, since these parts grind themselves to a close fit, as will be readily understood. From the truck-bolster the air passes downward through an opening 19 into a depending conduit 20 fitted thereover, from which branch pipes 21 lead the air into the motor casings. From the latter the air escapes through suitable apertures, not shown.

10 In order to permit movement of the motors, due to the swiveling of the truck, and the up-and-down motion due to the car-springs, the branch pipes 21 have flexible portions 22, in bellows form. The bellows  
15 may be made of light material; such as rubber; and to prevent the bellows from collapsing, interior sleeves 23 may be provided, carried by the rigid portions of the pipes.

The rear end of the car is not shown in Fig. 1; but it is clear that if motors are provided for the rear axles these motors may be ventilated, and thereby cooled, in the same manner, the air therefor being supplied by the blower 6, or by an independent blower,  
25 not shown.

It will now be seen that the system of ventilation provided by my invention is simple and effective. With suitable modifications it may be applied to existing types of motor trucks other than that illustrated, without  
30 material change in the trucks themselves.

What I claim is:

1. In a system for the ventilation of electric railway motors, the combination with a  
35 car, a truck swiveled thereto, and one or more motors carried in the truck, of a blower carried by the car, a casing carried by the car, concentric with the swivel connection of the car and truck and providing an annular  
40 chamber, an air duct connecting said chamber with the blower and a pipe or pipes carried by the truck, in communication with said chamber and directing the current of air therefrom upon the motor or motors, as set  
45 forth.

2. In a system for the ventilation of electric railway motors, the combination with a car, a truck swiveled thereto, and one or more motors carried in the truck, of a blower  
50 carried by the car, an annular casing carried by the car, concentric with the swivel connection of the car and truck, an air-seal interposed between the casing and the adjacent portion of the truck, an air-duct leading from the blower and discharging air into  
55 said casing, and means carried by the truck for leading air from said chamber to the motor or motors, as set forth.

3. In a system for the ventilation of electric railway motors, the combination with a  
60 car, a depending pivot-member carried on the bottom thereof, a truck having a bearing for said pivot-member and provided with air-passages outside said bearing, and one or  
65 more motors carried in the truck, of a blower

carried by the car, a casing carried by the car, inclosing the said passages and forming an air chamber in conjunction with said pivot member, an air-duct leading from the blower into said chamber, and means, for  
70 leading air from the said air passages, outside of the said bearing, to the motor or motors as set forth.

4. In a system for the ventilation of electric railway motors, the combination of the  
75 depending pivot-member of a car, a truck having a hollow bolster provided with a bearing for said pivot-member, and with air-passages outside of said bearing and leading to the interior of the bolster, a casing con-  
80 centric with the pivot-member, extending downward into juxtaposition to the said air-passages of the bolster to inclose the same, and an air-pipe leading from the hollow bolster, as set forth. 85

5. In a system for the ventilation of electric railway motors, the combination with the swivel connection of a car and a truck, comprising a pivot-member carried by the car and a bearing therefor carried by the  
90 truck; of a casing concentric with said swivel connection, stationary relatively to one of the parts thereof and forming in conjunction with the swivel connection an air chamber, and means for leading air from the  
95 said air-chamber to one or more motors carried in the truck, as set forth.

6. In a system for the ventilation of electric railway motors, the combination with the swivel connection of a car and a truck,  
100 comprising a pivot member carried by the car and a bearing therefor carried by the truck; of a casing concentric with the said swivel connection, stationary relatively to one of the parts thereof and forming in con-  
105 junction with the swivel connection an air-chamber, an air-seal interposed between the casing and the relatively movable part of the swivel connection, and a pipe for leading air from the said air-chamber to one or more  
110 motors carried in the truck, as set forth.

7. In a system for the ventilation of electric railway motors, the combination with the swivel connection of a car and a truck, comprising a pivot member carried by the  
115 car and a bearing therefor carried by the truck; of a casing concentric with the swivel connection and stationary relatively to one of the parts thereof, and an air-seal interposed between the casing and the rela-  
120 tively movable part of the swivel connection, comprising a member of U-shaped cross-section having its sides engaging the adjacent portions of the casing and the swivel connection, as set forth. 125

8. In a system for the ventilation of electric railway motors, in combination, a pivot member depending from the bottom of a car and having a socket for a center-pin, a truck  
130 having a hollow bolster provided on its top



with a bearing for the pivot member, with  
an aperture for the center-pin inside said  
bearing, and with air-apertures outside said  
bearing, a cup within the bolster and in-  
5 closing the center-pin aperture, a casing con-  
centric with the pivot-member, stationary  
relatively thereto and extending into prox-  
imity to the truck bolster, a flange extend-  
ing upwardly from the latter outside of its  
10 air-apertures and into the said casing, and a  
packing interposed between the flange and  
the casing, as set forth.

9. In a system for the ventilation of elec-

tric railway motors, the combination of a  
car, a truck, a swivel connection between the 15  
car and the truck, one or more motors car-  
ried in the truck, a blower carried by the car,  
an air chamber concentric with and outside  
of the swivel connection, an air-duct con-  
necting the blower and said chamber, and 20  
means for leading air from the chamber to  
the motor or motors, as set forth.

GEORGE GIBBS.

Witnesses:

W. L. MURRAY,  
S. S. DUNHAM.