

J. P. WOODBURY.

Car Truck.

No. 54,051.

Patented Apr. 17, 1866.

Fig. 1.

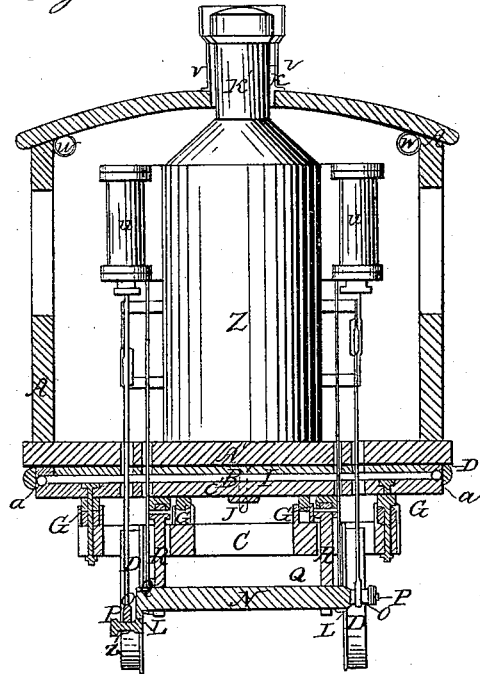


Fig. 1.

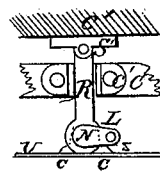
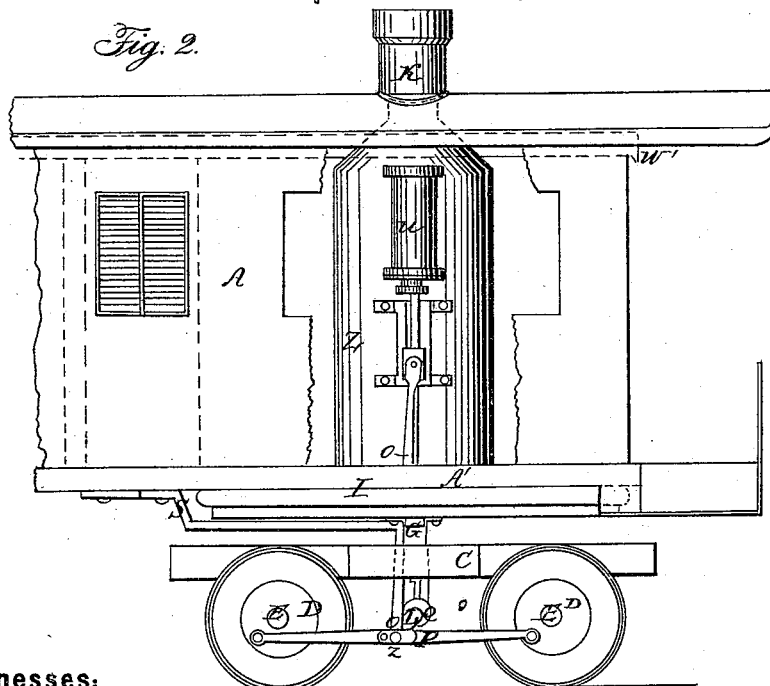


Fig. 2.



Witnesses:

Inglis Edison
Arthur Berry

Inventor:

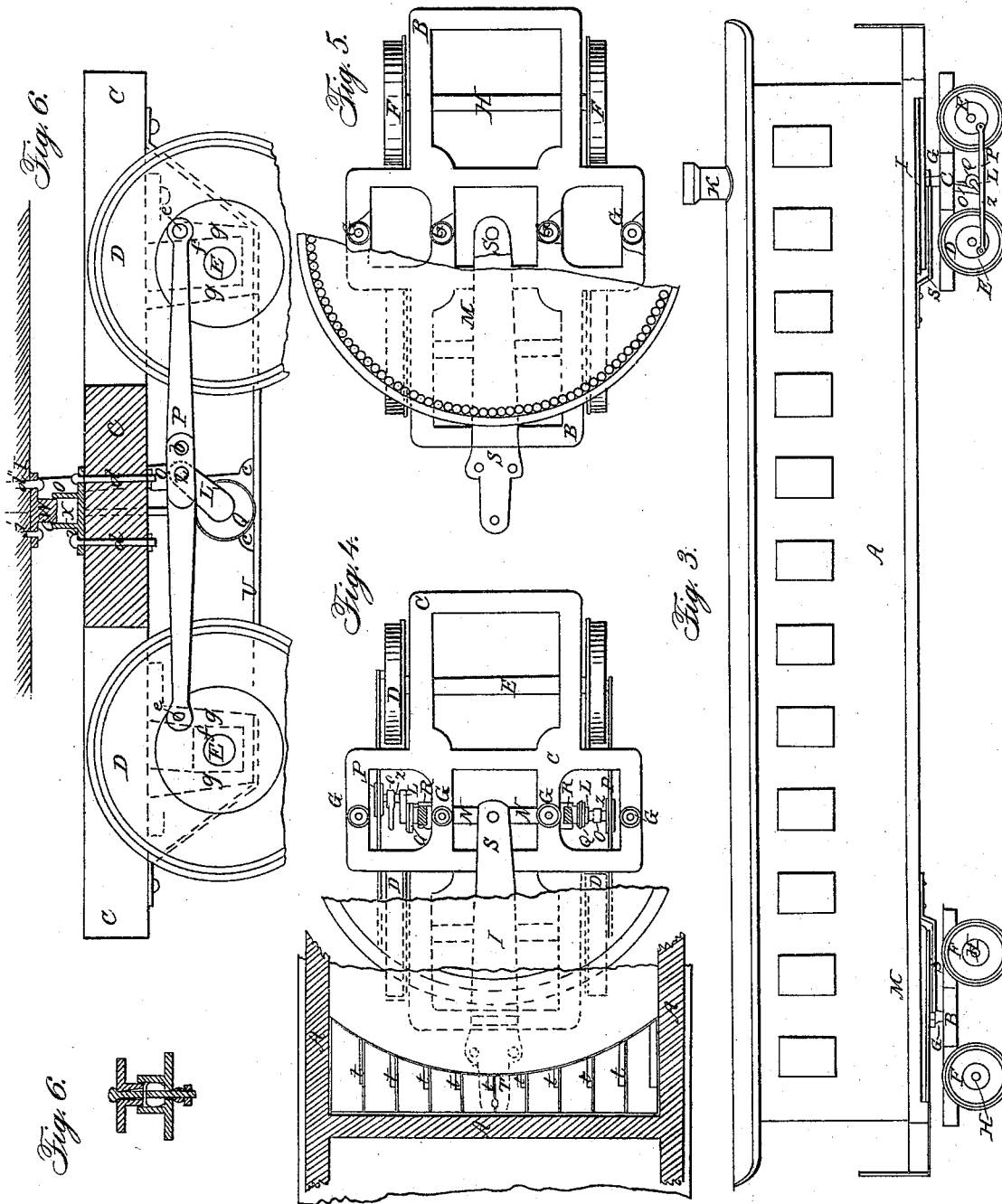
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Witnesses:

William E. Dean
A. H. B. Bury

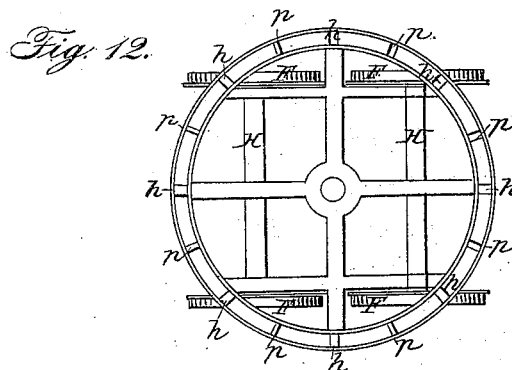
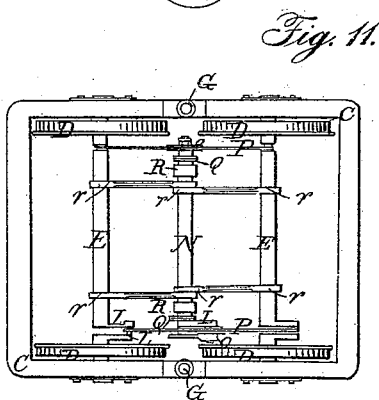
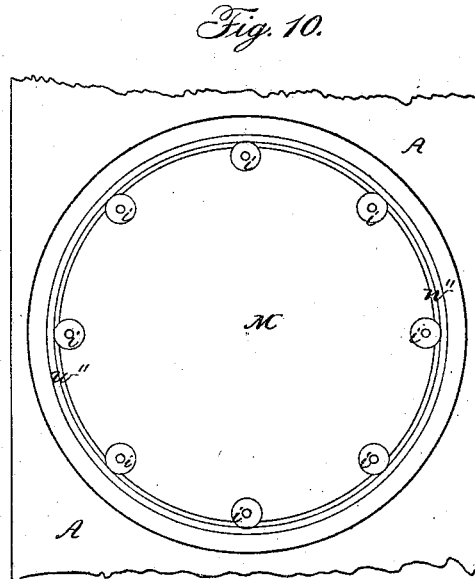
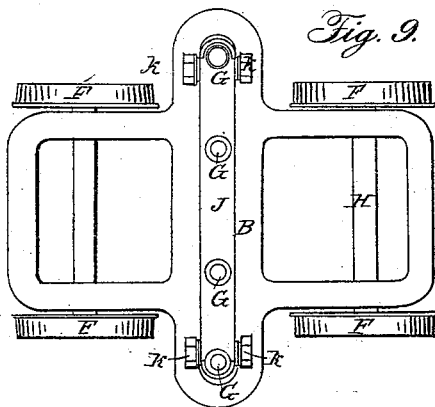
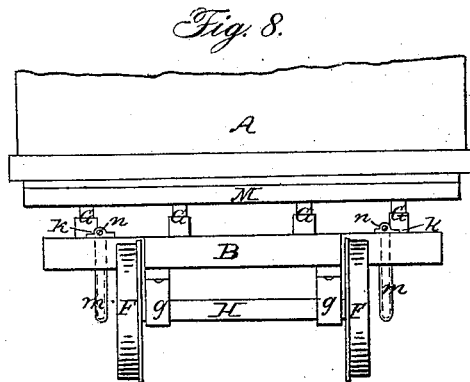
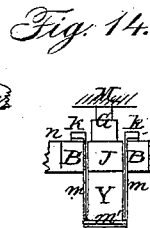
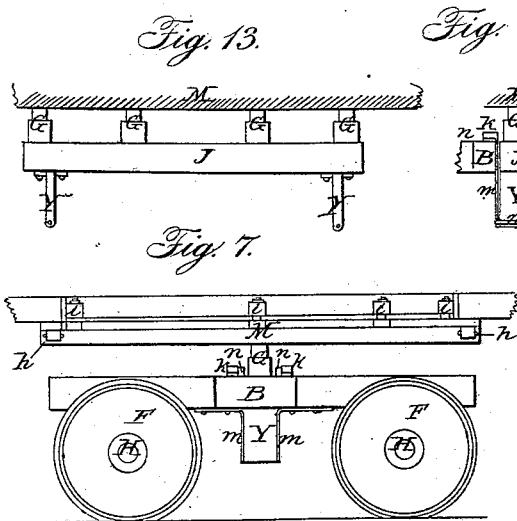
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A. H. Bury.

Inventor:

Joseph P. Woodbury

UNITED STATES PATENT OFFICE.

JOSEPH P. WOODBURY, OF BOSTON, MASSACHUSETTS.

IMPROVED LOCOMOTIVE-CAR TRUCK.

Specification forming part of Letters Patent No. 51,051, dated April 17, 1866.

To all whom it may concern:

Be it known that I, JOSEPH P. WOODBURY, of Boston, in the county of Suffolk, State of Massachusetts, have invented a new and Improved Locomotive-Car for Steam and Street Railroads; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters marked thereon.

To enable others skilled in the art to make and use my invention, I will proceed to describe its nature, construction, and operation.

The nature of my invention consists in certain improvements upon the construction of locomotive-cars as made by myself and illustrated in my patents dated January 24 and May 30, 1865, and entitled "improvement in street steam railroad-cars."

The principal features of improvement in my new locomotive-car are to make this car more particularly adapted to steam-railroads on short routes, and they may be enumerated thus: First, the method of connecting the truck-frame C of the engine-truck, Figures 1, 2, 4, 6, to the circular platform I of the same truck, Figs. 1, 2, and 6, by means of the four flexible and compressible hangers G, Figs. 4 and 6; second, the method of hanging the crank-shaft, Figs. 1 and 1'; third, the method of attaching the truck-frame B, Figs. 9 and 7, of the rear truck to its circular platform M, Figs. 7 and 10, by means of four flexible and compressible hangers, G, Figs. 7 and 8, in combination with the swinging bar J, Figs. 9, 13, and 14; fourth, the method of construction and position of the water-tank T, Fig. 4, so as to be convenient and at the same time give great security to the passengers in case of a boiler explosion; fifth, the method of ventilating the engine-room by means of the circular space around the smoke-stack K' is illustrated in Fig. 1; sixth, the method of constructing the smoke-stack double and having an air-space between the outside and inside stack, the outside stack being securely fastened to the roof of the car and turns with it around the inside stack whenever the engine and boiler trucks turn on curves; seventh, the method of ventilating the rear or passenger end of the car by the means of a pipe extending from the front end of the car and passing through the

engine and boiler room upon each side near the top horizontally, and with a register at the car or rear end that can be opened or closed at the pleasure of the passengers; eighth, the method of constructing the car-truck with inside connections and outside bearings, to be used on roads with wide gage, having crank-axes and parallel connecting-rod to connect each axle to the other, as shown in Fig. 11; ninth, the devices used in adjusting, supporting, and hanging the shaft N, Figs. 1 and 1'.

Having thus set forth the nature of my invention, I will proceed to describe its mechanical construction and the objects of the several parts.

The following drawings are annexed to and form a part of these specifications.

On Sheet No. 1, Fig. 1 is a vertical cross-section through the boiler, engine, circular platform, and engine truck-frame, also shows method of ventilation. Fig. 1' is a vertical section through the engine crank-shaft (see N, Fig. 1) and the crank-shaft hangers R. Fig. 2 is a side view, showing the engine and its truck and a part of the car.

On Sheet No. 2 Fig. 3 is a side elevation of the entire car. Fig. 4 is plan showing the engine-truck frame, a part of the circular platform, and a part of the floor of the car, with the water-tank. Fig. 5 is a plan showing parts of the rear truck. Fig. 6 is a longitudinal section through engine-truck.

On Sheet No. 3, Fig. 7 is a side elevation of the rear truck. Fig. 8 is an end elevation of the rear truck. Fig. 9 is a plan of rear truck. Fig. 10 shows one method of arranging the guiding-rollers for the circular platform to which the truck is attached. Fig. 11 is a plan showing the method of arranging the crank-shaft in case it is desirable to use inside connections. Fig. 12 is a plan showing the radial rollers upon which the platform revolves, and is fully described in my patent dated January 24, 1865. Fig. 13 is a longitudinal section through the swinging bar J. Fig. 14 is a cross-section of the same.

The body of my car may be constructed in any of the usual methods of constructing passenger-cars. It is obvious that in some respects the body of my car would vary from those of ordinary make, as the method of at-

taching and the constructing of my engines and truck are radically different from any others made.

Fig. 3, Sheet No. 2, represents, in general, the appearance of my car as I now propose to build.

Figs. 1 and 2, Sheet No. 1, show generally the form and fashion of construction of the boiler Z and engines *u u*. No particular description of the engines need be made, as the details will vary as experience may dictate, but is to be made for the present after the best plans now in use among engineers.

I attach my engine (using the word, in the general sense, to include the boiler, the engines, and engine-carriage) to my car in this manner: To the under side of the floor A', Fig. 1, of the car I firmly attach a circular track, D', Fig. 1. This track rests or moves upon small iron balls *a a*, Figs. 1 and 5, which roll in a groove made in upper side of the circular platform, Fig. 1. Instead of balls small rollers may be used, as I have already described in my patent dated January 24, 1865, and as illustrated in Fig. 12. The object of these balls or rollers is to allow the truck, which is attached to the circular platform, to turn freely about its center point. Figs. 7 and 10 is an illustration of another method of forming and attaching the circular platform to the bottom of the car.

W'' is an iron circular frame, which is securely bolted to the opening in the car-body, and with a projecting tongue on the inner side of the circle and a corresponding groove in the vertical rollers *i* to fit the circular tongue, and being so made that when the platform turns on curves the rollers revolve against the flat surface of the inner side of the iron circular frame and tongue at the same time, keeping the platform at all times parallel with the bottom of the car-body. This iron circular frame also has a flange formed on the lower side, which serves for an iron way for the radial rollers to roll against in supporting the car-body on circular platform.

S, Figs. 2 and 4, is a strong piece of iron firmly attached to the floor of the car, bent and arranged as shown in Fig. 2, so that one end reaches to the center of the circular platform and holds the lower end of the center-pin.

J' J', Fig. 1, is a center-pin which passes through the bar S, to which it may be secured by a key or screw-nut. By this method of attaching my platform to the car I leave the truck in absolute freedom to swing to any extent in going around curves or through switches, and it is also held by the vertical rollers, as shown in Figs. 7 and 10.

Method of attaching the truck-frame C, Figs. 1 and 2, to the circular platform I, Figs. 1 and 2.—G G G G, Fig. 8, show four flexible hangers, which connect the truck-frame B, rear truck, or C, Figs. 1 and 2, engine-truck, with the circular platforms I and M, Figs. 1 and 8.

G in Fig. 6 shows one of these hangers in detail, of which V represents a short stout cylinder with a flange, through which strong screw-bolts *d d* are passed to screw the same to the truck-frame. In this cylinder a piece of rubber, X, is placed.

W is a short plunger entering a little way into the cylinder V and resting upon the rubber X. The plunger W is screwed to the circular platform by the bolts *d' d''*. A bolt, *x'*, Fig. 6, passes through the whole length of the hanger. The ends of the bolt *x'* are loosely screwed to the upper and lower ends of the hanger in such a manner that it securely holds the parts together, but does not interfere with its flexibility. The cylinder V is made slightly elliptical to allow the plunger W to vibrate freely within it.

The connections already described between the truck-frame, the circular platform, and the car are common to both the front or engine truck and the rear truck; but the rear truck is provided with an additional appliance to enable it to adjust itself to the irregularities of the track. The rear truck-hangers, already described, are not connected directly with the truck-frame, but are all secured to the swinging bar J, Figs. 9, 13, and 14. The swinging bar J is connected with the truck-frame by means of the rigid pieces Y Y, Figs. 7, 13, 14, and the iron hangers *m m*, Figs. 7 and 14. The hangers *m m* are screwed to the rigid pin Y of the swinging bar J by the pins *m' m'*, Figs. 7 and 14, and to the truck-frame by the journals *n n*, working in the boxes *k k*, Figs. 7 and 14.

Method of connecting the crank-shaft N, Figs. 1 and 1', to the circular platform.—R in Figs. 1 and 1' is a strong piece of iron suspended from the circular platform by the pin *s'*, and made to maintain a relative position in regard to the truck-frame and wheels by the guard *e'*, which is bolted to the frame C. The pin *s'* is in the line about which the flexible hangers G G bend, so that no strain is brought upon any part of the truck-frame or of its connections by any oscillatory motion that may be imparted to it by irregularities of the track.

U, Figs. 1' and 6, is a strong bar passing under and connecting together the housings *g g* and *g g*. The bar U also serves to hold the box *e e*, which serves to hold the crank-shaft in position.

Means of communicating motion from the engine to the car.—O, Fig. 2, is a piston-rod connecting with the crank-shaft by means of the crank L. P P, Figs. 2 and 6, are connecting-links, which serve to communicate motion from the crank-shaft to the driving-wheels. But one of the parallel rods is connected directly with the crank L of the crank-shaft, but the two parallel rods are made to move together by the pin Z, Figs. 2 and 6.

The parallel rods P P, instead of being placed outside, as shown in Figs. 2, 4 and 6, may form an inside connection, as shown in Fig. 11. In Fig. 11, N is the crank-shaft. *rrrr*

are rods or bars connecting the axles E E with the crank-shaft, and always keeping it in a certain relative position with the axles. P P are parallel rods for communicating motion from the crank-shaft to the axles of the driving-wheels; R R, hangers, already described, and shown more fully in Fig. 1'.

This form of engine-truck is more especially adapted to broad-gage railways and street-railways.

The housings *g g*, Fig. 6, are made in any of the usual methods, with this difference: the inner braces of the housings upon which the boxes *ff* slide are curved surfaces, with a common center of curvature at the center of the crank-shaft. The object of curving these faces is that the center E of the wheels may preserve a uniform distance from the center of the crank-shaft, although the springs may be much compressed by the heavily-loaded car.

The water-tank T, Fig. 4, is made in plan, as shown, and as high as the car will conveniently admit of, being so formed as to admit of the ventilating-pipes and bell-rope to pass clear from it. It is made of strong wrought-iron plates and divided by vertical wrought-iron partitions *t t t t*, &c., Fig. 4. These partitions are not made water-tight, but are perforated, so that the water in all the compartments will maintain the same level. The object of these partitions is twofold: first, to check the water from suddenly washing or dashing from one side of the tank to the other, and, second, to give additional strength and stability to the tank.

Ventilation is secured in the engine-room by the arrangement of smoke-stack K', Fig. 1, and its hood K in such a manner that an annular space is left between them. This being constantly open, and leading, as it does, from the interior to the exterior of the engine-room, admits of and urges a most perfect ventilation for the engine-room.

The passenger or rear part of the car is ventilated by the pipes *ww*, Fig. 1, (also shown by dotted lines in Fig. 2,) which have an opening, *w'*, Fig. 2, at the front of the car for the purpose of taking in fresh air. This fresh air is conveyed by the pipes to the front of the passenger-apartment and there delivered. When the car is in motion the amount of air sent in is amply sufficient for perfect ventilation, although the car may be crowded with passengers. Other ventilation may be provided in the common way. As the ventilating-pipes pass through the warm engine-room, the air delivered from them in the winter will have a mild temperature, thus causing no inconven-

ience to those passengers who may be near the front end of the car.

There should be an ash-pit formed by making an opening entirely through the circular platform under the boiler of sufficient size to allow the ashes to be freely discharged from the grate-bars into an ash-pan which is suspended below the circular platform. This ash-pan may be surrounded by a thin metallic plate at a sufficient distance to afford a free draft of air to the fire, and which will come down low enough to entirely conceal the fire, and thus prevent the frightening of animals.

It is obvious that, instead of an engine in which steam is used, I may use an engine propelled by superheated steam, compressed or hot air, gas, springs, or, in fact, any contrivance for communicating or generating power.

Having thus described and set forth my invention, I make the following claims:

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

1. The construction and support of the circular platform I, Fig. 1, of the engine-truck to the truck-frame by means of the four flexible and compressible hangers G, Figs. 4 and 6, substantially as described, and for the purpose set forth.
2. The construction of the flexible and compressible hangers shown in detail in Fig. 6, substantially as described, and for the purpose set forth.
3. The devices used in adjusting and hanging the crank-shaft N, Figs. 1 and 1', substantially as described, and for the purpose set forth.
4. The combination and arrangement of the hangers G, the swinging bar J, the truck-frame B, and the circular platform M of the rear truck, Figs. 7, 8, and 9, substantially as described, and for the purpose set forth.
5. The combination of the grooved rollers *ii* and circular iron track *w''*, Fig. 10, substantially as described, and for the purpose set forth.
6. The combination of the ventilating-pipes *ww*, Figs. 1 and 2, with the engine-room and passenger part of the car, for the purpose of conducting the cool and fresh air from the front end of the car through the heated space of the engine-room to the passenger end of the car, substantially as described, and for the purpose set forth.

JOSEPH P. WOODBURY.

Witnesses:

WILLIAM EDSON,
A. HUN BERRY.