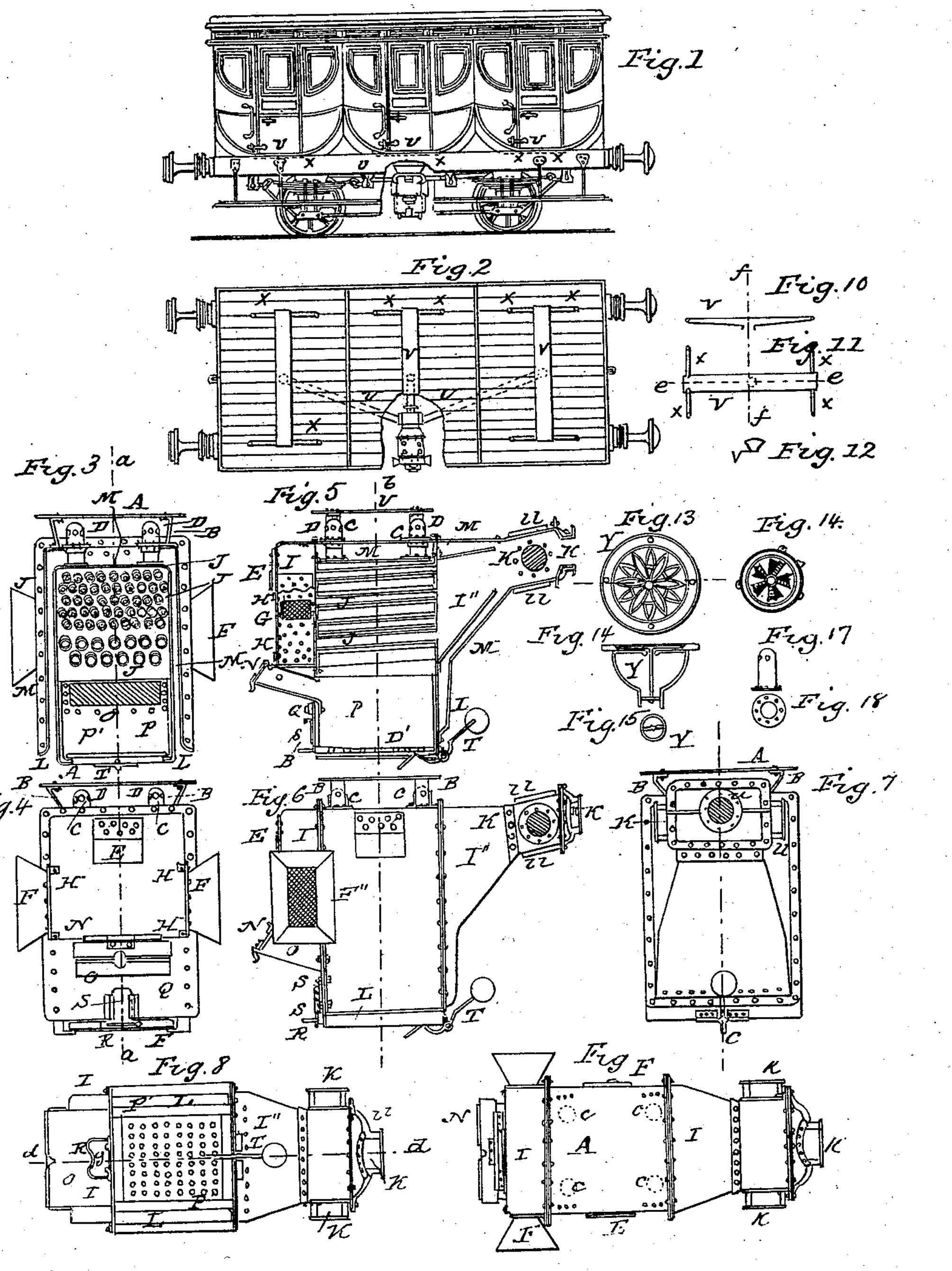
P. GRANDJEAN.

Railroad Car Heater.

No. 108,702. Patented Oct. 25, 1870.



Witnesses

Inventor

UNITED STATES PATENT OFFICE.

PIERRE GRANDJEAN, OF PARIS, FRANCE.

IMPROVEMENT IN RAILROAD-CAR HEATERS.

Specification forming part of Letters Patent No. **108,702**, dated October 25, 1870.

To all whom it may concern:

Be it known that I, PIERRE GRANDJEAN, of Paris, in the Empire of France, have invented a new and Improved Apparatus for Warming and Ventilating Carriages and Boats; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which drawings—

Figure I represents a front view of my apparatus, showing it in working position under the floor of a railroad-car. Fig. II is a plan or top view of the same. Fig. III is a transverse vertical section of the apparatus detached, the line *b b*, Figs. V and VI, indicating the plane of section. Fig. IV is an elevation of the same, showing the front of the apparatus. Fig. V is a longitudinal vertical section of the same, taken in the plane *a a*, Figs. III and IV. Fig. VI is a side view of the apparatus. Fig. VII is an end view of the same. Fig. VIII is an inverted plan of the same. Fig. IX is a top view of the same. Fig. X is a longitudinal section of a foot-warmer in the plane *e e*, Fig. XI. Fig. XI is a plan or top view of the same. Fig. XII is a transverse section of the foot-warmer in the plane *f f*, Figs. X and XI. Figs. XIII, XIV, XV, and XVI represent different detached views of the air-holes and registers. Figs. XVII and XVIII are detached views of the chimneys.

Similar letters indicate corresponding parts.

This invention relates to an apparatus for warming and also for cooling and ventilating carriages and boats, particularly railroad-cars; and I will here remark that in the following description particular regard has been taken to the application of my apparatus to railroad-cars, with the distinct understanding, however, that the same is applicable to carriages of every description, and also to steamboats or other vessels.

My apparatus consists of a box capable of being attached to the bottom of a railroad-car, and provided with funnel-shaped air-spouts facing in opposite directions and communicating with an air-chamber, from which the air passes through pipes into the distributing-chamber, which communicates with the interior of the car. The air-spouts are provided with doors, which open and close automatically, according to the direction in which the car moves. The pipes leading from the air-chamber to the distributing-chamber are situated over a fire-grate, so that the air, while passing through said pipes, can be heated. The distributing-pipes communicate with boxes let into the bottom of the car as foot-warmers when hot air is introduced, or as distributing-boxes when cold air is introduced. With the fire-grate is combined an automatic shaking device operated by the motion of the car. The products of combustion are carried off by suitable chimneys projecting from the top of the heating-chamber, and situated under a protecting-plate to prevent the heated gases from coming in direct contact with the bottom of the car.

In the drawings, the letter A designates a metal plate, which is interposed between the top of my apparatus and the bottom of the car, to protect the latter against the injurious effects of the products of combustion issuing from the chimneys C. Said protecting-plate rests on supports B, and the chimneys C are provided with lateral discharge-openings D for the products of combustion. Suitable brackets, E, serve to secure the apparatus to the bottom of the car.

Near one end of the apparatus, and on opsite sides thereof, are the air-spouts F, which are protected by net-work F″ against the entrance of dirt and rubbish, and which communicate with the air-chamber I. Each of the air-spouts is provided with a door, G, hung in hinges H and opening inward, so that the door on the spout facing the direction in which the car moves will open, while the other closes automatically by the action of the air. The air, which rushes through one of the spouts into the air-chamber, strikes a perforated partition-plate, I′, whereby it is caused to spread, and it then passes through a series of pipes, J, to the distributing-chamber I″, (see Fig. V,) whence it is carried off through pipes K, leading to the interior of the car. The pipes J are situated over a fire-box, P, which is supplied with fuel through the feed-channel O. In the bottom of said fire-box is the perforated plate or grate P′, which is subjected to the action of a loaded lever, T, so that when the car is in motion a shaking motion is imparted to said grate to keep the fire clear and free from dirt. The fire-box and

the distributing-chamber are provided with a double jacket, M, which communicates through holes L with the external atmosphere, so that the air passing in through these holes will be heated by coming in contact with the sides of the fire-box. The apertures K of the distributing-chamber communicate by means of pipes U (see Fig. II) with boxes V, let into the bottom of the car, and serving as foot-warmers in winter time, and which are provided with registers Y, through which the air is admitted into the car. Said boxes are also provided with distributing-pipes X, to carry the air under the seats of the car.

The foot-warmers may be constructed of any suitable size, and their bottom parts are protected by means of felt or other suitable material, to prevent loss of heat by radiation.

The registers represented in Figs. XIII, XIV, and XV are arranged so that by closing the aperture communicating with the interior of the car another aperture is opened, which allows the air to escape in the open atmosphere. By these means the apparatus is prevented from getting overheated.

What I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for heating and ventilating carriages and boats, constructed with an air-chamber, I, a series of pipes, J, and a distributing-chamber, I″, substantially as shown and described.

2. The combination of the fire-box P with the air-chamber I, pipes J, and distributing-chamber I″, substantially as set forth.

3. The shaking-lever T, in combination with the grate P′, said lever being actuated by the motion of the car, as set forth.

P. GRANDJEAN. [L. S.]

Witnesses:
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DUERO.