

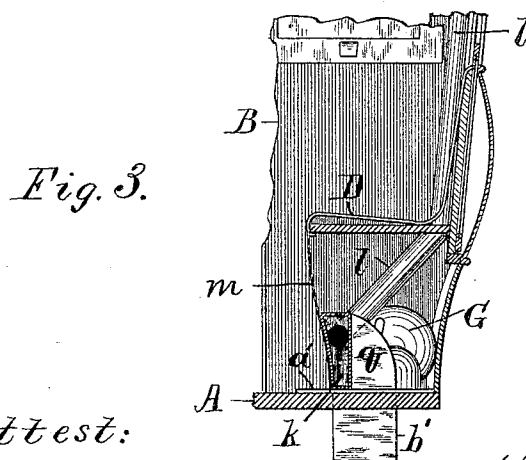
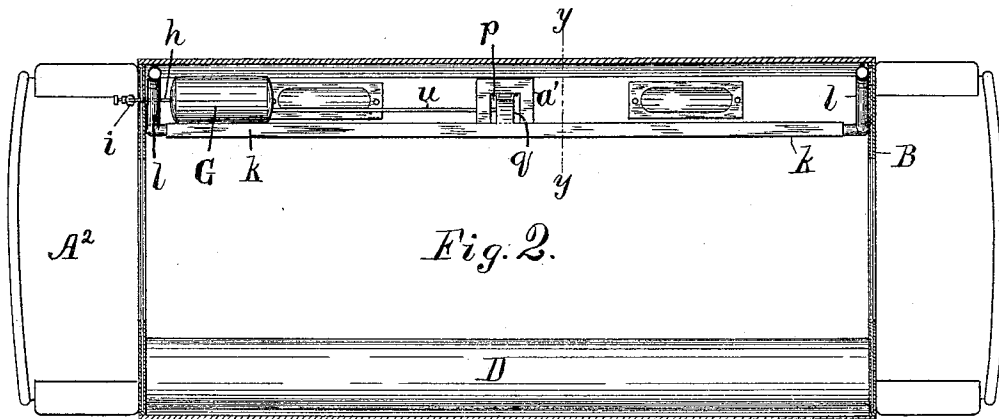
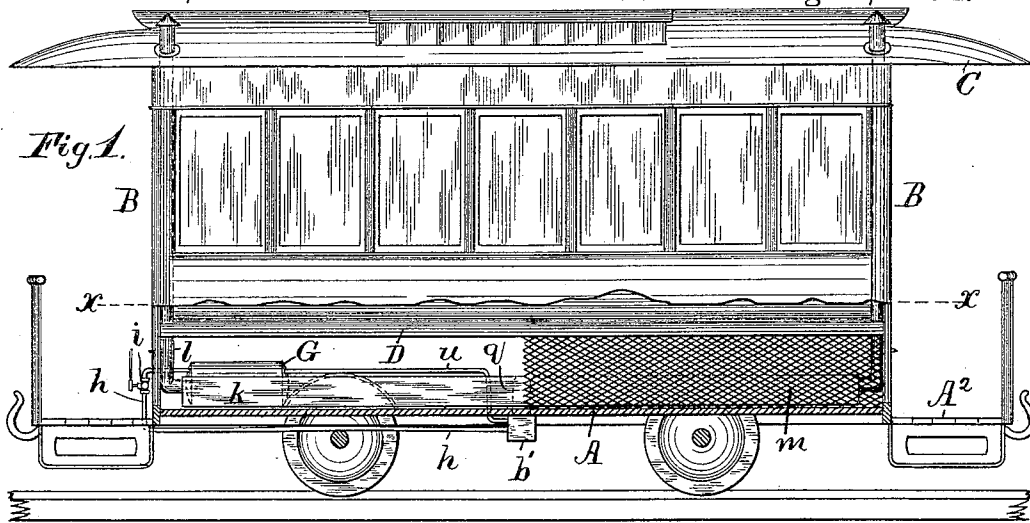
(No Model.)

2 Sheets—Sheet 1.

S. STEWART.
GAS CAR HEATER.

No. 480,216.

Patented Aug. 2, 1892.



Attest:
Frank West Jr.
Edw. P. Kinsey.

Inventor.
S. Stewart, per
Crane & Miller, attys.

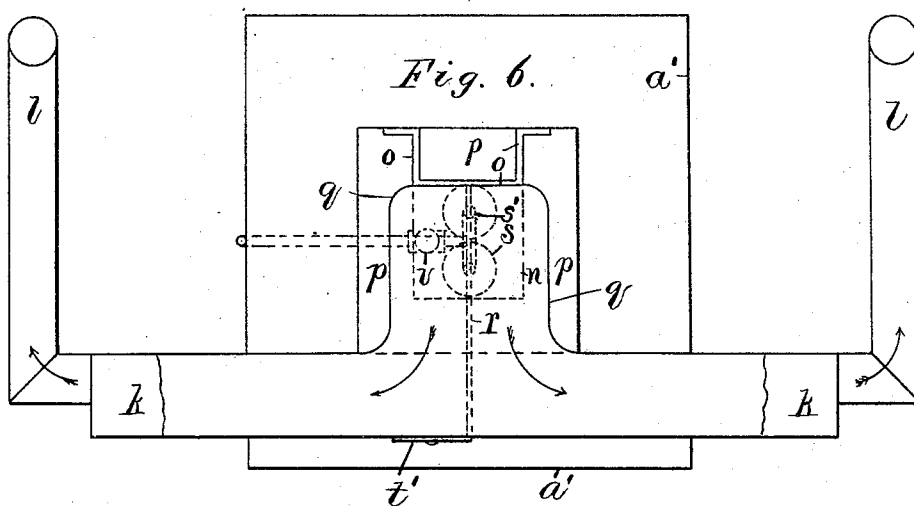
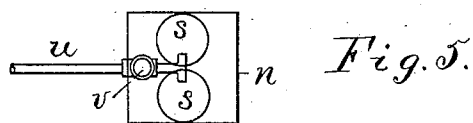
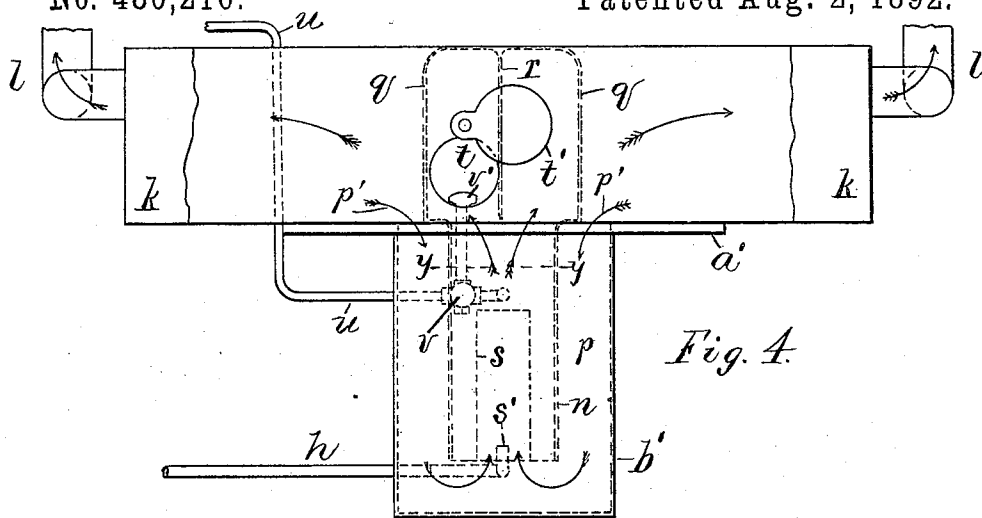
(No Model.)

2 Sheets—Sheet 2.

S. STEWART.
GAS CAR HEATER.

No. 480,216.

Patented Aug. 2, 1892.



Attest:
L. Lee.
F. C. Fischer.

Inventor.
S. Stewart, per
Crane & Miller, Atty.

UNITED STATES PATENT OFFICE.

SAMUEL STEWART, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE STEWART MANUFACTURING COMPANY, OF NEW JERSEY.

GAS CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 480,216, dated August 2, 1892.

Application filed September 4, 1891. Serial No. 404,792. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL STEWART, a citizen of the United States, residing at Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Gas Car-Heaters, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention consists in the construction and arrangement herein shown and described for a street-car-heating apparatus, and will be understood by reference to the annexed drawings, in which—

Figure 1 is an elevation of a street-car having my improvement, with the lower portion broken away on the center line and a portion of the screen *m* removed to expose the several parts of the heating apparatus. Fig. 2 is a sectional plan of the same on line *x x* in Fig. 1, with the seat above the heating apparatus removed to expose the latter in plan view; and Fig. 3 is a transverse section on line *y y* in Fig. 2 of a portion of the car-body upon a larger scale. Fig. 4 is a side view of the gas-stove with a portion of the heating-pipes. Fig. 5 is a plan in section on line *y y* in Fig. 4, and Fig. 6 is a plan of the stove with part of the heating-pipes connected thereto.

A represents the floor of the car, B the ends, C the top, and D the seats in the car, where shown.

The gas-stove is formed with a flange *a'*, resting upon the floor under one of the seats, and with a body *b'*, projecting through an aperture in the floor below the same.

G is a receiver for gas under pressure, placed beneath the seat D, and *h* is a pipe extended from such receiver to the platform *A*² and thence to the stove, a cock *i* being placed in the pipe at the platform for regulating the consumption of gas.

The stove is shown located at the middle of the car's length.

k are heating-pipes extended along the floor under the front edge of the seat D toward each end of the car, where they connect with chimney-flues *l*, which extend upward through the roof C. It will thus be seen that the heating-pipes *k* perform the function of flues in carrying off the products of combustion

in addition to that of receiving the air heated by the stove. To protect these pipes from injury, a wire screen *m* is extended in front of the same, as indicated in Fig. 1.

The body *b'* of the stove is closed at the bottom, and a chamber *n*, open at the top and bottom, is inserted in the body and supported therein in any convenient manner, as by metal bars *o*, attached to the body and chamber near the top. The bottom of the chamber, like its sides, is separated from the body by an air-space *p*, and one or more heating gas-burners *s* are fixed in the bottom of the chamber and extended upward toward the plate *a'*, with their lower ends opening through the bottom of the chamber to receive their supply of air from the spaces *p*. The top of the chamber is connected by a branch or hood *g* with the heating-pipes *k*, and a partition *r* is extended longitudinally through the hood and transversely across the heating-pipes to divide the heated air and gases that rise from the chamber and divert the same toward the opposite ends of the car into the flues *l*.

Two burners are shown in Figs. 5 and 6, arranged with their centers on a line with the partition shown in Fig. 6, so that the hot air rising from both the burners will be divided equally by such partition. The hood covers but little of the air-spaces *p*, and the air is therefore freely admitted downward from the plate *a'*, as shown by the arrows *p'* in Fig. 4, to supply the burners *s* for combustion, as required.

To light the gas at the burners when required, a hand-hole *t* is made in the front of the pipe *h* at one side of the partition *r*, with a movable cover *t'* to close the same. A permanent hole would be formed in the wire-netting at the same place.

To facilitate the lighting of the gas-stove, an auxiliary pipe *u* is extended from the receiver G into the chamber and provided with a nozzle or small aperture adjacent to the top of each burner to serve as a "pilot-burner" for the latter. A cock *v*, with handle *v'*, is provided in the pipe where it can be reached by the operator through the hand-hole *t*, and such burners may thus be lighted at any time before the car is occupied. By this construction it is only necessary when it becomes de-

sirable to use the stove in heating the car to open the cock *i* at the platform *A*², which directs the flow of gas from the receiver into the burners. Such flow of gas is immediately ignited by the jets from the pipe *u*, if previously lighted, as described above. By the provision of the auxiliary gas-jets not only is it possible to provide for the lighting of the gas-stove at any time during the trip of the car without disturbing the passengers that may occupy seats adjacent to the stove, but it forms a convenient way of lighting the main burners *s*, which would be otherwise inaccessible for this purpose. By the closing of the body *b'* at its bottom and the drawing of the air to support the combustion from the air-spaces *p*, which open within the car, the burners are not only protected from disturbance by outside drafts, but the air is also partially heated before it reaches the burners by its downward passage alongside the heated chamber *n* to enter the lower ends of the burner-tubes. The drawing of the air from the floor of the car and its discharge from the chimneys *l* also serves to maintain a positive circulation of air within the car, and to thus effect a ventilation, which it is well known is very desirable in the colder seasons of the year when the car requires heating.

The burners *s*, referred to herein, are represented as cylinders of sheet metal, with a gas-jet *s'* at the lower end, which is supplied from the pipe *h*, and such cylinder would in practice be covered at the top with a perforated plate or wire-gauze to effect a proper combustion of the gas, as is common in such constructions; but it will be understood that the particular construction of the burner is immaterial, as it forms no part of my present invention.

I am aware of the state of the art disclosed by United States Patents Nos. 27,449, 88,055, 310,948, 340,826, 374,659, and 383,316, and I hereby disclaim the constructions shown therein and all prior constructions for a car-

heater, limiting myself to the particular construction and arrangement of parts shown, described, and claimed specifically herein.

Having thus set forth the nature of my invention, what I claim herein is--

1. The combination, with a street-car, of the gas-stove set in the floor of the same and comprising the body *b'*, open at the top, and the inclosed chamber *n*, having the burners *s*, the pipes *k*, extending the whole length of the car and provided with the smoke-flues *l* at the ends, and the hood *q*, connecting the top of the chamber *n* with the said pipes, substantially as and for the purpose set forth.

2. The combination, with a street-car, of the gas-stove set in the floor of the same and comprising the body *b'*, open at the top, and the inclosed chamber *n*, having the burners *s*, the pipes *k*, extending the whole length of the car and provided with the flues *l* at the ends, the hood *q*, connecting the top of the chamber *n* with the said pipes, and a partition *r* in the hood, extending across the pipes *k* to divide the heated air and gases from the stove and direct them equally into each of the pipes *k*, substantially as shown and described.

3. The combination, with a street-car, of a receiver *G* for compressed gas, the stove set in the floor of the car and provided with the chamber *n* and gas-burners *s*, as described, the heating-pipes *k*, connected with the chamber and extended to the ends of the car, a gas-pipe extended from the receiver to the platform and thence to the burners *s*, a cock in the gas-pipe, accessible from the platform of the car, and an independent pilot-burner adjacent to the said burners, the whole arranged and operated as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAMUEL STEWART.

Witnesses:

THOS. S. CRANE,
H. H. RUSSELL.