

(No Model.)

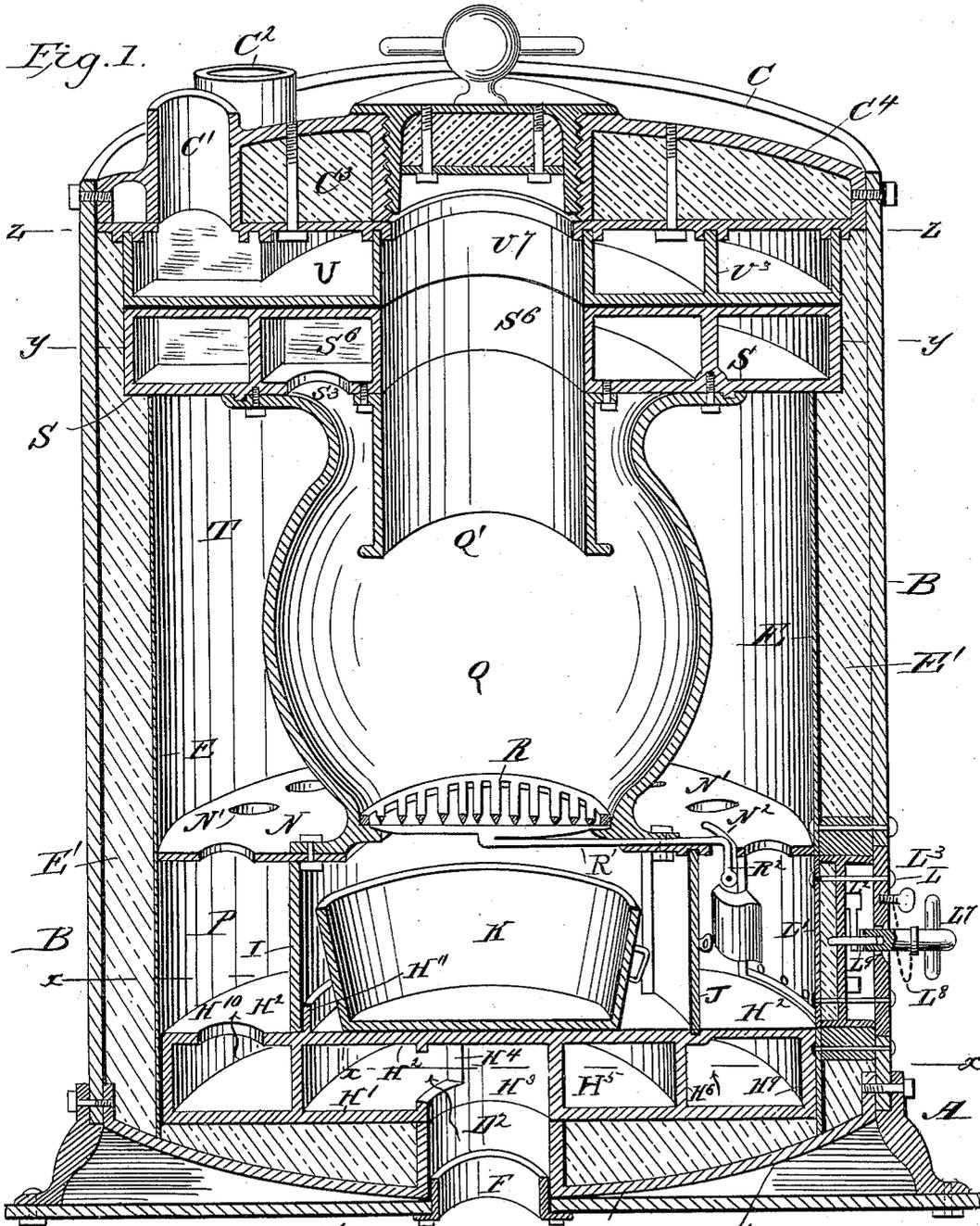
4 Sheets—Sheet 1.

J. Q. WINFIELD & B. H. STRICKLER.

CAR HEATER.

No. 395,470.

Patented Jan. 1, 1889.



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(No Model.)

4 Sheets—Sheet 2.

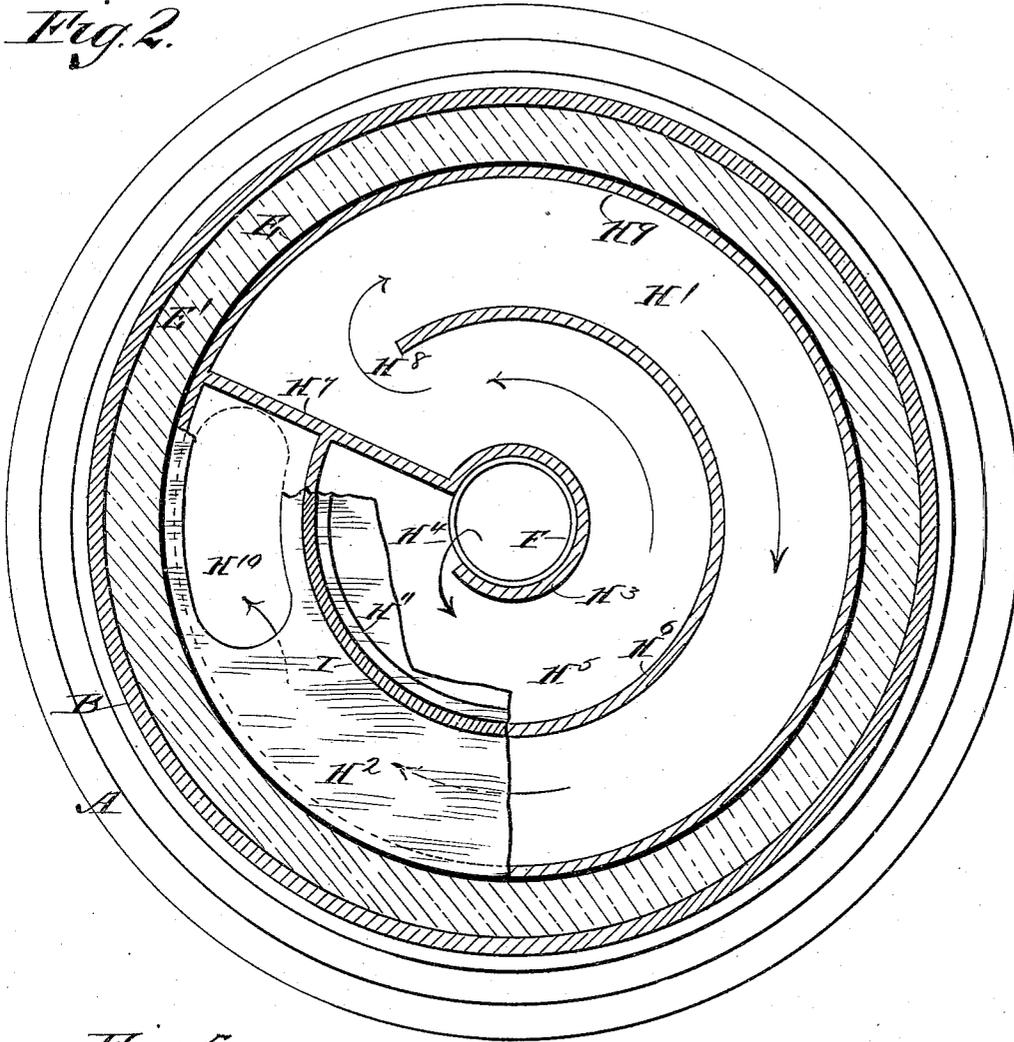
J. Q. WINFIELD & B. H. STRICKLER.

CAR HEATER.

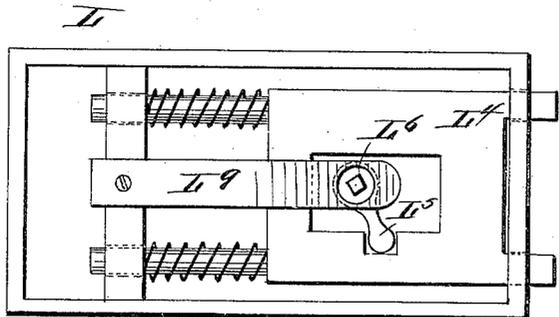
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*Fig. 2.*



*Fig. 5*



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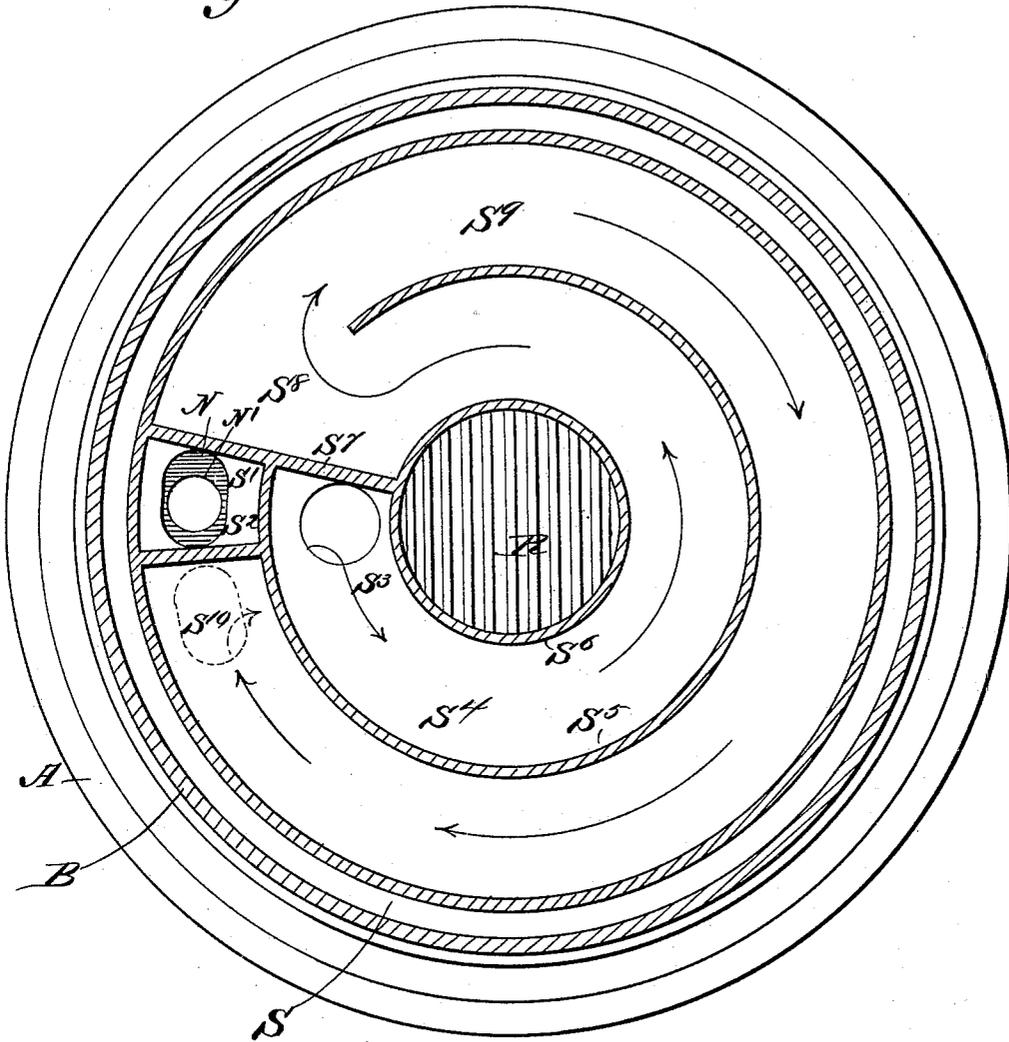
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*Fig. 3*



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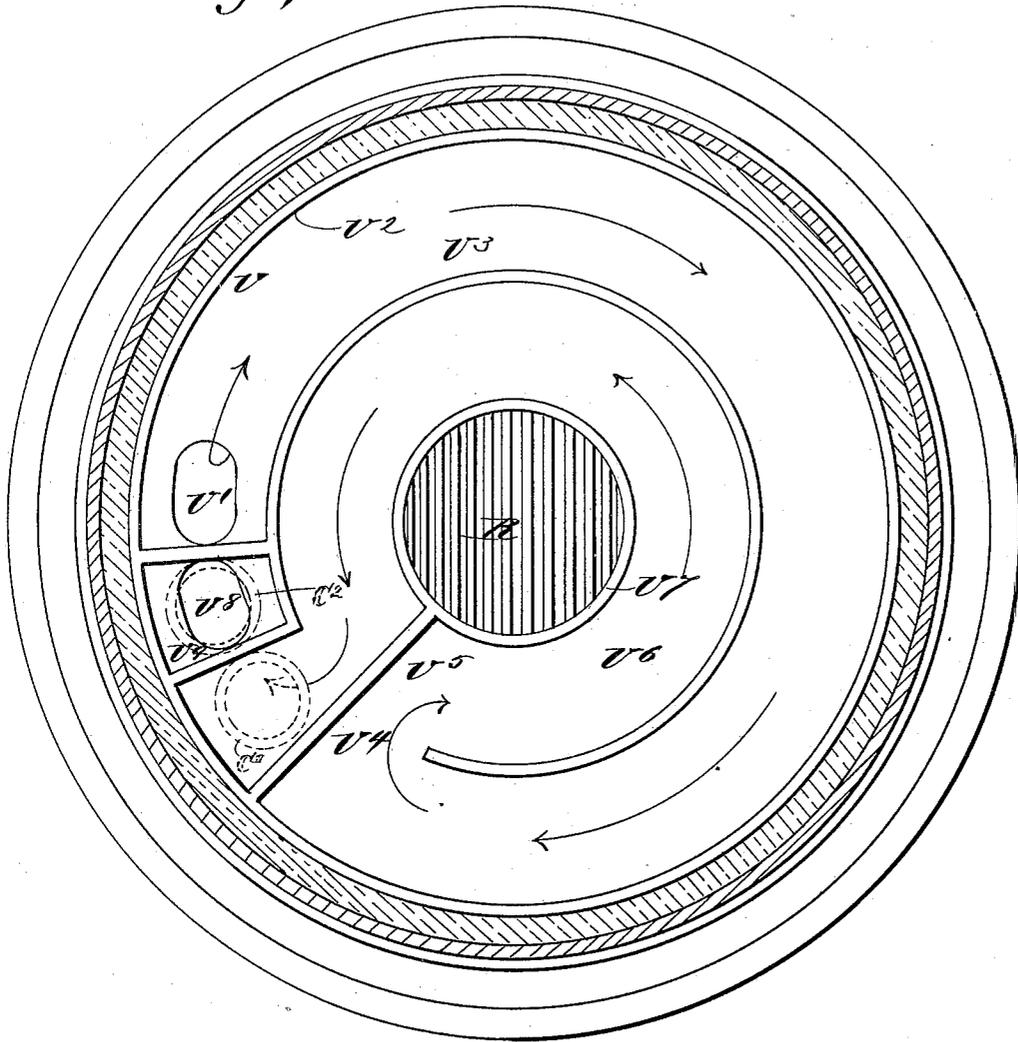
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*Fig. 4*



WITNESSES:

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ATTORNEY,

# UNITED STATES PATENT OFFICE.

JOHN Q. WINFIELD AND BENJAMIN H. STRICKLER, OF BROADWAY,  
VIRGINIA.

## CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 395,470, dated January 1, 1889.

Application filed March 21, 1888. Serial No. 267,922. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN Q. WINFIELD and BENJAMIN H. STRICKLER, both of Broadway, in the county of Rockingham and State of Virginia, have invented a new and Improved Car-Heater, of which the following is a full, clear, and exact description.

The object of the invention is to provide an improved car-heater which furnishes pure heated air to the cars and is not liable to set the cars on fire in case of an accident to the latter.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a central sectional perspective view of the improvement. Fig. 2 is a sectional plan view of the same on the line  $xx$  of Fig. 1, parts being broken away. Fig. 3 is a like view of the same on the line  $yy$  of Fig. 1. Fig. 4 is a similar view of the same on the line  $zz$  of Fig. 1, and Fig. 5 is a face view of the door with the front plate removed.

The improved car-heater is provided with an annular base, A, on which is secured a casing, B, closed on top by a cover, C, bolted to the said casing B, and closed at the bottom by a curved plate, D, similarly fastened as the casing B to the said base A. On the inside of the bottom plate, D, is formed an annular projection, D', on which fits a second casing, E, thus forming a space between the outer casing, B, and the said casing E, said space being filled in with a non-combustible material, E', such as asbestos, &c. On the inside of the bottom plate, D, is also formed a central annular projection, D<sup>2</sup>, which fits on a short pipe, F, secured on the floor F' of the car in which the heater is located. The pipe F extends to the outside, and may be provided with an elbow, if desired, so as to admit the air from the side of the car.

On the tops of the annular projections D' and D<sup>2</sup> rests the bottom plate, H', of a casing, H, provided with a top plate, H<sup>2</sup>, and with a

central annular pipe, H<sup>3</sup>, which opens at its bottom on the annular projection D<sup>2</sup>, and the said pipe H<sup>3</sup> is provided with a side opening, H<sup>4</sup>, leading to a channel, H<sup>5</sup>, formed in the said casing H between the pipe H<sup>3</sup> and an annular wall, H<sup>6</sup>, held between the top plate, H<sup>2</sup>, and the bottom plate, H'.

The cold air from the outside can pass through the pipe F, the annular offset or projection D<sup>2</sup>, and the pipe H<sup>3</sup> through the opening H<sup>4</sup> into the channel H<sup>5</sup>, and through the latter in the direction of the arrow shown in Fig. 2, and then the air passes out of the said channel H<sup>5</sup> through the opening H<sup>8</sup> by striking against a radial partition, H<sup>7</sup>, formed between the top and bottom plates, H<sup>2</sup> and H'. The radial partition H<sup>7</sup> extends from the pipe H<sup>3</sup> to the outer wall of the casing H, and the opening H<sup>8</sup> leads into a channel formed between the outer wall, H<sup>9</sup>, and the annular wall H<sup>6</sup>, so that the air travels in an opposite direction in this channel from that in which it traveled in the channel H<sup>5</sup>. The air finally passes through an opening, H<sup>10</sup>, formed in the top plate, H<sup>2</sup>, of the casing H.

On top of the top plate, H<sup>2</sup>, is formed a short segmental projection, H<sup>11</sup>, on the outside of which rests a segmental partition, I, the ends of which are connected by sliding doors J, which can be opened, so as to establish a connection between the outer part of the segmental partition I and the inside of the same. The partition I incloses the ash-pan K, which rests on top of the top plate, H<sup>2</sup>. In front of the sliding doors J is held a hinged door, L, formed in a corresponding opening in the double casings B and E, and serving to give access to the doors J and the ash-pan K. Between the casing E and the segmental partition I is formed a space, P, into which the air coming through the opening H<sup>10</sup> is discharged, said air being permitted to pass partly through the open doors J to the interior inclosed by the partition I, and part of the said air can pass through the openings N' in the plate N, resting on top of the segmental partition I.

The plate N, above the ash-pan K, is provided with a central opening, and on top of the inner edge of the said plate N rests the fire-pot Q, of any approved construction, and

provided with a grate, R, having a shaking-rod, R', extending to the top of the plate N and through a slot, N<sup>2</sup>, in the same downward into the space formed between the sliding doors J and the door L. The downwardly-extending part R<sup>2</sup> of the shaking-rod R' serves as a handle for the operator to use in shaking the grate R.

On top of the fire-pot Q is held a casing, S, which forms, with the casing E, the plate N, and the exterior of the fire-pot Q the space T, into which the air from the openings N' passes. On top of the casing S rests a casing, U, from which lead the air-outlet pipe C' and the smoke-outlet pipe C<sup>2</sup>, formed in the top plate, C, of the casing B. In the bottom plate of the casing S is formed an opening, S', which leads to a chamber, S<sup>2</sup>, formed in the said casing S, and in the top plate of the said casing is a like aperture, which registers with an aperture, U', formed in the bottom plate of the casing U. The aperture S' leads from the space T, formed around the fire-pot Q, so that the hot air from the space T passes through the said aperture S' into the chamber S<sup>2</sup>, and from the latter through the opening U' into a circular channel, U<sup>2</sup>, formed in the casing U, between the outer wall of the said casing and a segmental partition, U<sup>3</sup>, held between the bottom and top plates of the said casing. At the end of the said segmental partition U<sup>3</sup> is formed an opening, U<sup>4</sup>, which leads to a channel, U<sup>5</sup>, formed between the said partition U<sup>3</sup> and the central pipe, U<sup>7</sup>, formed in the casing U. A partition, U<sup>6</sup>, is formed between the outer wall of the said casing U and the said pipe U<sup>7</sup>, so that the air passing into the channel U<sup>5</sup> through the aperture U' travels in the direction of the arrows, as indicated in Fig. 4, passes through the opening U<sup>4</sup> and, is turned in an opposite direction by a partition, U<sup>5</sup>, and then travels in the said channel U<sup>6</sup>, and finally passes out into the air-outlet C', from which the air is delivered to the car by suitable radiators.

The smoke and gases arising in the fire-pot Q pass through an opening, S<sup>3</sup>, in the bottom plate of the casing S, and pass into a circular channel, S<sup>4</sup>, formed between a central pipe, S<sup>6</sup>, and a segmental partition, S<sup>5</sup>, held in the said casing S. In the latter is also formed a radial partition, S<sup>7</sup>, at the end of the channel S<sup>4</sup>, so that the gases traveling in the said channel are directed by the said partition S<sup>7</sup> in an opposite direction and pass through an opening, S<sup>8</sup>, into the channel S<sup>9</sup>, formed between the exterior wall of the said casing S and the segmental partition S<sup>5</sup>. At the end of the channel S<sup>9</sup> the gases and smoke pass through an opening, S<sup>10</sup>, and a corresponding opening, U<sup>8</sup>, into a chamber, U<sup>9</sup>, in casing U, and from thence through a corresponding opening into the outlet-pipe C<sup>2</sup>, held in the top plate, C, and provided with suitable piping to lead said gases to the outside of the car.

The annular pipe U<sup>7</sup> registers with the an-

ular pipe S<sup>6</sup> of the casing S, and the latter opens into a downwardly-extending pipe, Q', fastened to the under side of the bottom plate of the casing S and extending a suitable distance into the fire-pot Q. In the top plate, C, is formed a threaded pipe, which registers with the pipe U<sup>7</sup>, and into the said threaded pipe screws the cap V. When the latter is unscrewed and removed, the fire-pot Q, can be filled with coal or other suitable fuel by passing the latter through the central opening formed by the pipes U<sup>7</sup>, S<sup>6</sup>, and Q'.

The door L, above mentioned, may be provided with a lock of any approved construction, preferably, however, the lock illustrated in Figs. 1 and 5. The door L is provided with an inner plate, L', which forms, when the door is closed, a continuation of the casing E, and next to the said plate L' is held a curved plate, L<sup>2</sup>. The space between the plate L<sup>2</sup> and the inner plate, L', is filled with asbestos or other suitable non-combustible material. Between the plate L<sup>2</sup> and the outer plate, L<sup>3</sup>, is placed a lock, which consists of a spring-plate, L<sup>4</sup>, operated by an arm, L<sup>5</sup>, secured to the square lock-post L<sup>6</sup>, on which operates the key L<sup>7</sup>, held removably and attached to the chain L<sup>8</sup>, secured to the outside of the outer plate, L<sup>3</sup>, of the door L. The lock-post L<sup>6</sup> is surrounded by the apertured free end of a spring, L<sup>9</sup>, secured to the middle plate, L<sup>2</sup>, and serving to press the key L<sup>7</sup> outward as soon as the operator releases his hold on the said key L<sup>7</sup>.

The operation is as follows: A fire is started in the fire-pot Q on top of the grate R, and then additional fuel can be added at any time and the fire-pot Q filled by unscrewing the cover V and introducing the fuel, as above described. The cover V is then again placed on the top plate, C. The air necessary for combustion is admitted to the bottom of the grate R by opening the sliding doors J, held at the ends of the segmental partition I. The doors can be opened to any desired distance, so as to admit more or less air; or the doors J can be entirely closed, if desired, by the operator opening the door L and reaching inside. The air passes from the outside of the car through the pipe F and the annular projections D<sup>2</sup> and H<sup>3</sup> into the channel H<sup>5</sup>, as above described, and from the latter passes to the outer channel in the casing H, and through the aperture H<sup>9</sup> into the space P, and from the latter part of the air passes through the door J to the fire-pot Q, and part of it passes through the openings N' to the space T, surrounding the fire-pot Q. The air coming in contact with the exterior of the hot fire-pot Q is heated, and then passes, in the manner above described, to the casings S and U, in which it is again exposed to the heat of the said casings, which are heated by the escaping smoke and gases from the fire-pot Q passing through the opening S<sup>3</sup> into the casing S and around the same in opposite directions, as above de-

scribed. Thus the air gets very much heated before it passes to the outlet-pipe C and from the same to the cars.

The grate R may be operated at any time by the shaking-rod R', so that the ashes can pass through the grate R into the ash-pan Q, which, when filled, can be removed through the doors J and the door L.

Between the top plate of the casing U and the cover C may be placed a filling of asbestos, and a like filling may be placed between the bottom plate, D, of the casing B and the bottom plate, H', of the casing H. Thus it will be seen that the car-heater is provided with a double-lined casing, so that in case of accident the fire in the fire-pot Q cannot easily pass to the outside, even if the exterior casing, B, is smashed by being upset or from other causes.

In order to more conveniently clean the smoke flues and channels, we may reverse the arrangement of the smoke-flues and hot-air flues, so that the smoke flues or channels are over the hot-air channels instead of under, as shown.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a car-heater, the combination, with a double-lined casing, of a cold-air casing held in the bottom of said first-named casing and provided with air-channels running in opposite directions, a third casing held on the top of the second casing and connected with the same, and doors leading from the said third casing to the ash-pit, substantially as shown and described.

2. In a car-heater, the combination, with a double-lined casing, of a cold-air casing held in the bottom of said first-named casing and provided with air-channels running in opposite directions, a third casing held on the top of the second casing and connected with the same, doors leading from the said third casing to the ash-pit, and a fire-pot resting on top of the said third casing and forming an air-space with the double-lined casing, substantially as shown and described.

3. In a car-heater, the combination, with a double-lined casing, of the casing H, held in the bottom of the said double-lined casing and connected in its middle with the outside and leading to a space, P, a segmental partition, I, forming with the said double-lined casing the said space P, the doors J, held on the said segmental partition I, and the door L, registering with the said doors J and formed in the double-lined casing B, substantially as shown and described.

4. In a car-heater, the combination, with a double-lined casing, of the casing H, having channels running in opposite directions, the partition I, resting on top of the said casing H, the doors J, held on the said partition I, the plate N, having the apertures N', the fire-

pot Q, resting on the said plate N, the grate R, held in the said fire-pot Q and provided with a shaking-rod, R', extending through an aperture, N<sup>2</sup>, and the door L, held in the said double-lined casing in front of the said doors J and the outer end of the shaking-rod R', substantially as shown and described.

5. In a car-heater, the combination, with an outer casing and a fire-pot supported in the casing and forming with said casing an air-space, of a casing, S, supported upon the fire-pot and provided with chambers communicating with the fire-pot and space surrounding the same, and a second casing, U, supported upon the casing S and provided with chambers communicating with the chambers of the casing S, each of the casings S and U being provided with channels running in opposite directions, substantially as described.

6. In a car-heater, the combination, with an outer casing provided with hot-air and smoke outlets in its top and a fire-pot supported in the casing and forming with the said casing an air-space, of the casing S, supported upon the fire-pot and communicating with the fire-pot and the air-space surrounding the same and provided with channels running in opposite directions, and the casing U, arranged upon the casing S and communicating with the same and with the hot-air and smoke outlets and provided with channels running in opposite directions, substantially as herein shown and described.

7. In a car-heater, the combination, with a double-lined casing, of a fire-pot held in the said casing and forming a space between the said casing and the exterior of the fire-pot, the casing S, held on top of the said fire-pot and provided with channels leading in opposite directions, the casing U, held on top of the said casing S and provided with similar channels, the said casings S and U being provided with registering openings leading to the space formed between the said fire-pot and the double-lined casing, and an air-outlet pipe leading from the said casing U, substantially as shown and described.

8. In a car-heater, the combination, with a double-lined casing, of the fire-pot Q, the casing S, held on top of the said fire-pot Q and provided with channels leading in opposite directions, the casing U, held on top of the said casing S and also provided with channels leading in opposite directions, and central filling-pipes held in the said casings S and U, a threaded central filling-pipe held in the cover of the said double-lined casing, and a cover screwing on the said threaded central filling-pipe, substantially as shown and described.

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