C. H. KREBS.

CAR HEATER.

APPLICATION FILED JULY 20, 1916.

1,213,503. Patented Jan. 23, 1917.

2 SHEETS—SHEET 1.

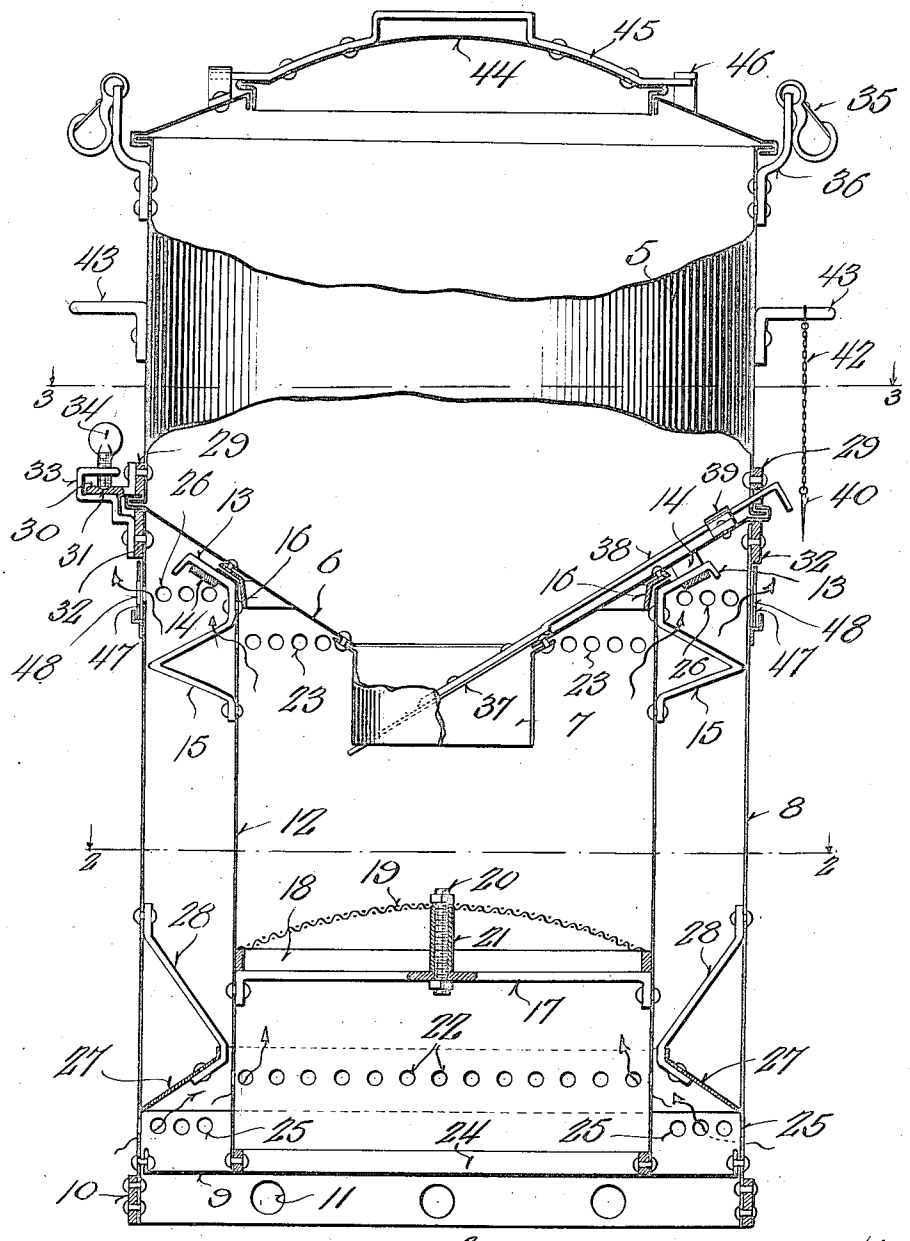


Fig. 1.

Witnesses:

Inventor:
Charles H. Krebs
By Geo. Young
Attorney

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2 SHEETS—SHEET 2.

Fig. 2.

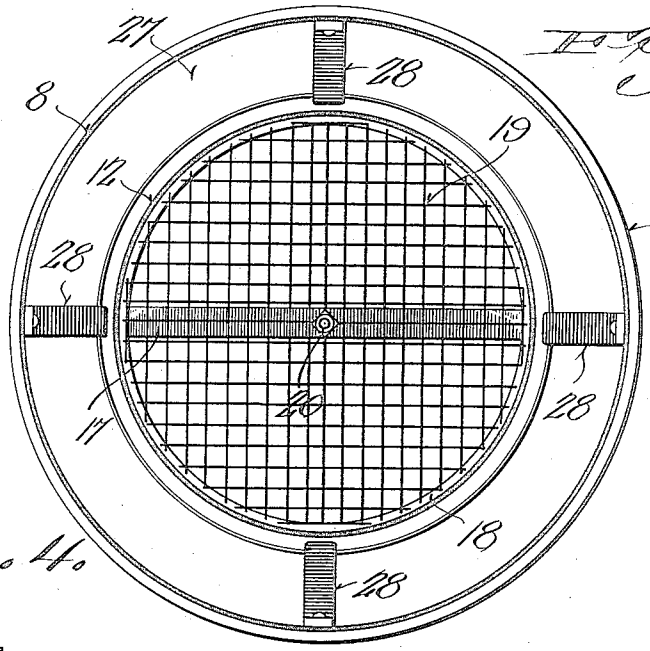


Fig. 4.

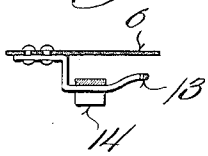
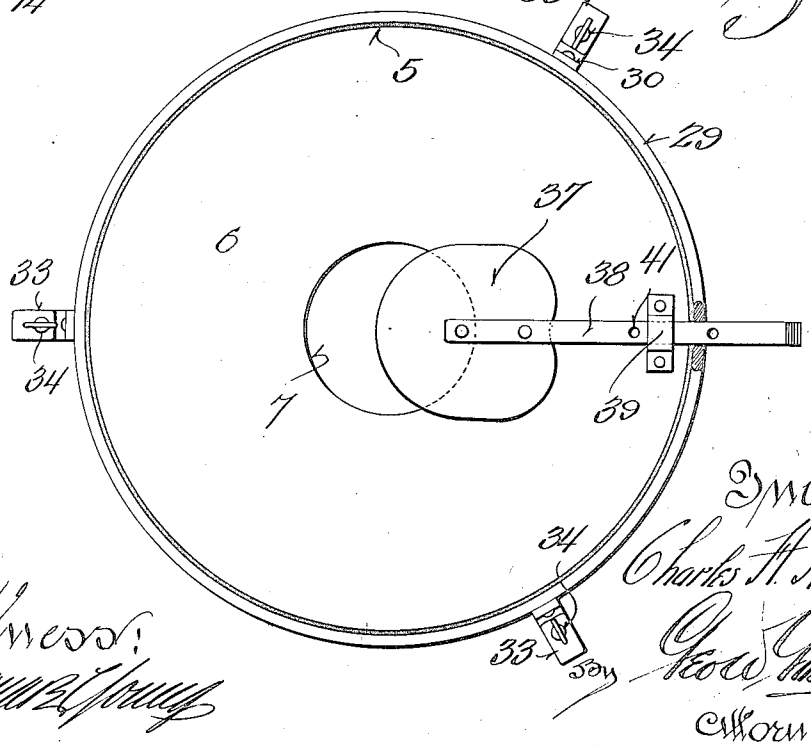


Fig. 3.



Witness:

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UNITED STATES PATENT OFFICE.

CHARLES H. KREBS, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO EVERBURN HEATER COMPANY, OF MILWAUKEE, WISCONSIN.

CAR-HEATER.

1,213,503. Specification of Letters Patent. Patented Jan. 23, 1917.

Application filed July 20, 1916. Serial No. 110,264.

To all whom it may concern:

Be it known that I, CHARLES H. KREBS, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Car-Heaters; and I do hereby declare that the following is a full, clear, and exact description thereof.

The present invention relates to new and useful improvements in heaters adapted for burning charcoal or other similar carbonized solid fuel and is more particularly directed to the provision of a heater adapted to be used in railway cars.

It is primarily an object of the present invention to provide a heater of this nature which may be suspended within a car and wherein means is provided for positively preventing the escape of burning coals from the heater, with consequent danger of fire.

It is more specifically an object in this connection to provide an arrangement whereby such means serves also as an air heating chamber in conjunction with the heater in a manner conducing to a desired circulation of air.

It is still further an object to provide a heater which may be readily manipulated for the removal of ashes therefrom and for starting a fresh fire therein.

In view of the jars and jolts to which a suspended car heater is subjected, it is also further an object to provide a structure wherein the various parts are efficiently braced to withstand jarring strain.

A more detailed object resides in the provision of an improved fire box and grate structure connected with the major portion of the heater in such manner as to permit ready disassembly for cleaning or for the purpose of substitution should the parts become burned out.

With the above and other objects and advantages in view the present invention resides more particularly in the novel combination, arrangement and formation of parts more particularly hereinafter pointed out and more particularly pointed out in the appended claims.

In the drawings: Figure 1 is a vertical sectional view through a car heater constructed in accordance with the present invention. Fig. 2 is a transverse sectional view through the heater on the line 2—2 of Fig. 1. Fig. 3 is a transverse sectional view through the upper portion of the heater on the line 3—3 of Fig. 1. Fig. 4 is a detailed view showing the method of securing the fire box drum to the hopper.

Referring now more particularly to the accompanying drawings, 5 designates a cylindrical hopper which forms the upper portion of the heater and which has a bottom 6 of inverted frustoconical shape terminating in the discharge neck 7. Secured to and depending from the peripheral portion of the hopper bottom is an outer casing 8 having a closed bottom plate 9, the wall of the casing being extended slightly below this bottom plate and provided with an annular reinforcing band 10, this band and the adjacent wall portion being apertured at 11 to form an open air space when the heater is seated on the ground. Disposed within the outer casing and of such lesser diameter as to provide an annular air space between it and the outer casing is a burner drum 12 which is secured at its upper end to the intermediate portion of the hopper bottom 6, by ears 13 projecting from the top of the drum in a direction parallel to the hopper bottom and engaging in clip plates 14 carried on said hopper bottom. These ears 13 comprise the upper ends of bars 15 secured to the hopper drum and these bars have their intermediate portions outwardly offset to form handle grips for manipulating the burner drum to attach it or detach it with respect to the hopper, and said outwardly offset portions also serve by engagement with the outer casing 8, as a brace means for the burner drum. To assist in centering the drum with respect to the hopper bottom, to facilitate attachment to the clips 14, an annular apron 16 is secured to and depends from the hopper bottom inwardly of the said clips. To form a grate within the burner drum, a bar 17 is disposed transversely in the lower portion of the drum and seated on this bar is a band 18 which fits the periphery of the drum. Seated on the band, is an upwardly dished grate body 19 formed of foraminous material. This grate body is secured on the band by a bolt 20 passed therethrough and through the transverse bar 17, a sleeve 21 being disposed on the bolt between the grate body and the bar.

Thus by tightening the bolt, the grate may be firmly secured in place, the natural resistance thereof, serving to procure a desired binding engagement on the band, and the grate may be removed for replacement by simply removing the bolt. Immediately below the grate the drum is provided with an annular series of air inlet openings 22 and the upper portion of the drum above the neck 7 is provided with an annular series of openings 23. Thus air from the annular chamber formed by the casing 8 and the drum 12 may pass into the drum and into the grate to procure proper combustion. Above the grate the burner drum defines a fire box and below the grate it defines an ash pit and inasmuch as the bottom edge of the drum firmly engages the bottom plate 9 of the outer casing, this ash pit is inclosed to prevent escape of ashes and coals into the annular chamber when the outer casing 8 is in position, the bottom edge of the drum being provided with a reinforcing band 24.

Below the openings 22 of the drum and above the bottom plate 9, the outer casing is provided with an annular series of openings 25 and a second annular series of openings 26 is provided in the outer casing above the openings 23 of the drum. Thus burning of fuel in the fire box will cause air to be drawn into the annular air heating chamber through the openings 25 and this air passes upwardly and outwardly through the openings 26 thus setting up a positive circulation, a portion of this air also passing into the burner drum through the openings 22. Inasmuch as the velocity of the air current set up in the annular chamber would otherwise prevent admission of sufficient air through the openings 22, a frusto-conical baffle plate 27 is provided in the annular chamber, with its outer edge engaging the outer casing and with its inner edge disposed adjacent and above the openings 22. This baffle plate is secured in place by arms 28 fastened to the outer casing above the said plate and inclined downwardly and inwardly and bent about and secured to the plate. These arms in addition to providing a securing means for the plate also serve an exceedingly valuable function in holding the lower portion of the drum against lateral movement within the outer casing. Due to the downward and inward inclination of the arms 28, said arms further serve as a means for guiding the burner drum to its normal central position in the outer casing upon insertion of said drum in the casing.

Taking up now the manner of detachable connection of the outer casing with the lower portion of the hopper, said lower portion of the hopper is provided with an annular reinforcing band 29 from which at spaced intervals projects lateral ears 30 provided with sockets 31 in their top faces and the upper end of the outer casing is provided with an annular reinforcing band 32 to which is secured attaching brackets 33 each adapted for coöperation with a respective ear, and comprising a portion bent outwardly and upwardly and then inwardly to embrace the ear. Through the inwardly directed portions of the brackets are passed set screws 34 which are adapted to engage the ear and seat in the socket thereof to bind the ears against the outwardly directed portions of the brackets. Thus the outer casing may be removed by manipulating the set screws 34. It is noted, however, that the mere loosening of the screws does not serve to positively detach the outer casing when the burner is suspended, as the inwardly directed portions of the brackets 33 would seat on the ears 30, and thus a positive turning movement of the outer casing must be procured to detach it. This feature is valuable inasmuch as it permits the ready loosening of all of the screws to procure detachment. The heater is in normal operation suspended from suitable eye bolts or other members carried by the roof of a car, by means of snap hooks 35 carried by ears 36 projecting upwardly from the upper end of the hopper.

To provide a means for shutting off flow of fuel from the hopper to the fire box to thus extinguish the fire, a valve plate 37 is slidable diagonally across the neck to close it, and this valve plate is carried by a stem 38 mounted in a guide plate 39 on the bottom 6 of the hopper. This stem extends outwardly of the hopper to provide for manipulation and is normally held in retracted position by a staple 40 passed through an opening 41 therein, this staple being carried by a chain 42 secured to one of a pair of handle members 43 provided on the hopper. For filling the hopper a cover 44 is provided and secured transversely on this cover is a bar 45 having its intermediate portion upwardly offset to form a handle for the cover, and having its ends projected laterally past the cover to engage under clip plates 46 secured on the top of the hopper, to thus hold the cover in position.

Taking up now the operation and advantages of the structure described, the hopper is filled with fuel and the device then suspended in a car. Should the heater not be lighted at its time of assembly and suspension in the car, it may be readily lighted at any subsequent time by removing the outer casing 8 and applying a torch to the bottom of the grate, it being noted that upon removal of the outer casing the entire bottom of the burner drum is opened. This is a valuable feature inasmuch as cars consigned to certain points, are often started on their

journey under such temperature conditions as to render a fire unnecessary and the fire is kindled *en route* should the occasion arise.

It is noted that the removal of the outer casing does not affect the charge of fuel within the heater in contradistinction to various existent types of car heaters wherein detachment of the lower portion of the heater releases the fuel contained in the burner drum. Inasmuch as the bottom edge of the casing forms, with the lower portion of the burner drum, a closed fire box, it is impossible for coals to escape in a manner procuring danger of fire.

In the normal use of the heater, the burner drum is never detached from the hopper except perhaps for the removal of foreign matter which might gain access to the fire box. However, should the burner drum burn out, or should it be desired to replace the grate body 19, the drum may be readily detached.

Should it be desired to extinguish the fire in the burner, the valve plate 37 is closed to prevent the feeding of fuel from the hopper. It may in some instances be desired to throttle the fire to reduce its intensity and for this purpose a rotatable damper band 47 surrounds the outer casing adjacent its series of openings 26 and is provided with corresponding openings 48 normally alining therewith.

In view of the swaying of the suspended heater caused by motion of travel of the car, and in view of the various jars and jolts to which the heater would be subjected when suspended in a car, it is essential to provide an arrangement wherein the escape of coals from the burner is positively prevented, and further wherein the various portions of the burner are mutually braced to resist such jars and jolts which in the extreme instances might swing the heater against the ceiling of the car. As stated the outer casing in addition to its function of an air heating chamber to promote a positive circulation of heated air throughout the car, serves to prevent the escape of coals, it being noted that there is no door or other opening from the fire box and that the fire box can only be opened by removing the outer casing. Also, the bars 15 and 28 efficiently brace the burner drum and hold it centered within the outer casing.

I claim:

1. A car heater comprising a hopper, an outer casing depending from and detachably connected with the hopper and provided with vertically spaced series of openings, a bottom closure for the casing, and a burner drum depending from the hopper within the casing and spaced from the wall of said casing to form therewith an air heating chamber.

2. A car heater comprising a hopper, means for suspending the hopper, an outer casing depending from and detachably connected with the hopper and provided with vertically spaced series of openings, a bottom closure for the casing, and a burner drum depending from the hopper within the casing and spaced from the wall of said casing to form therewith an air heating chamber.

3. A car heater comprising a hopper, an outer casing depending from and detachably connected with said hopper, a bottom closure for the casing, an open bottom burner drum depending from the hopper within the casing and adapted to engage the bottom closure of the outer casing and a grate in the drum.

4. A car heater comprising a hopper, an outer casing depending from and detachably connected with the hopper, a bottom closure for said outer casing and a burner drum secured to and depending from the hopper and disposed within the outer casing and spaced therefrom to form therewith an air heating chamber.

5. A car heater comprising a hopper, an outer casing depending from and detachably connected with the hopper and provided with vertically spaced series of openings, a burner drum depending from the hopper within the outer casing and spaced therefrom and provided with vertically spaced series of openings disposed intermediately of the openings of the outer casing, a grate in the burner drum between its series of openings and an annular baffle plate surrounding the burner drum above its lower series of openings.

6. A car heater comprising a hopper, an outer casing depending from and detachably connected with the hopper and provided with vertically spaced series of openings, a burner drum secured to and depending from the hopper within the outer casing and spaced therefrom and provided with vertically spaced series of openings disposed intermediately of the openings of the outer casing, a grate in the burner drum between its series of openings, an annular baffle plate surrounding the burner drum above its lower series of openings, and means for securing said baffle plate comprising arms secured to and extending inwardly from the outer casing, and serving also to brace the lower portion of the drum.

7. In a car heater including a hopper, means for suspending the hopper, and an outer casing detachably connected with and depending from the hopper, said detachable connection of the outer casing comprising lateral ears at the lower portion of the hopper and brackets carried by the outer casing and including portions extending outwardly and upwardly and inwardly to embrace said ears and set screws passed through the in-

wardly directed portion of the brackets to engage the ears.

8. In a heater of the class described, a hopper, an outer casing depending from and detachably connected with the hopper, clip members on the bottom of the hopper, a burner drum in the outer casing and bars secured to the burner drum and including lateral ear portions at the upper end of the drum engageable with the clip members and offset intermediate handle portions adapted to engage the outer casing.

9. A car heater comprising a hopper, an outer casing depending from the hopper and provided with vertically spaced series of openings, a burner drum depending from the hopper within the casing, and provided with vertically spaced series of openings disposed intermediately of the openings of the outer casing, and a grate in the burner drum intermediately of its series of openings.

10. A car heater comprising a hopper, an outer casing depending from the hopper and provided with vertically spaced series of openings, a burner drum depending from the hopper within the casing and provided with vertically spaced series of openings disposed intermediately of the openings of the outer casing, a grate in the burner drum intermediately of its series of openings, and a rotatable damper band disposed about the uppermost series of openings of the outer casing and provided with openings adapted to aline with said series of openings.

11. A car heater comprising a hopper, an outer casing depending from and detachably connected with the hopper and provided with vertically spaced series of openings, a burner drum secured to and depending from the hopper within the outer casing and spaced from the latter and provided with vertically spaced series of openings disposed intermediately of the openings of the outer casing, a grate in the burner drum between its series of openings, an annular baffle plate surrounding the burner drum above its lower series of openings, and means for securing said baffle plate comprising arms secured to and extending diagonally downwardly and inwardly from the outer casing to provide a guide means for insertion of the burner drum.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

CHARLES H. KREBS.

Witnesses:
FRANK S. RATCLIFFE,
M. E. DOWNEY.