

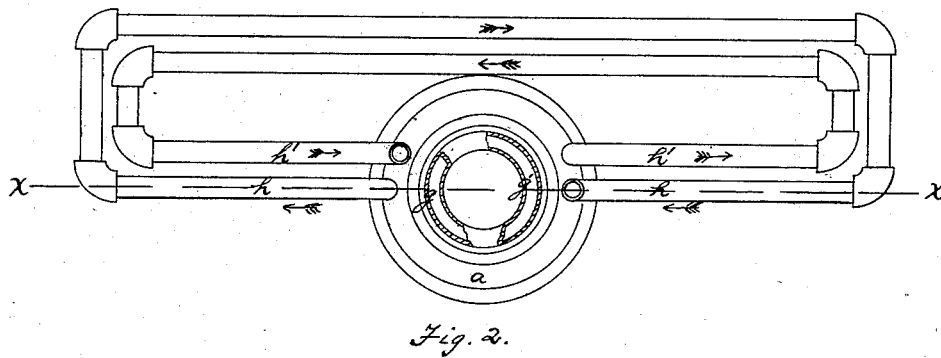
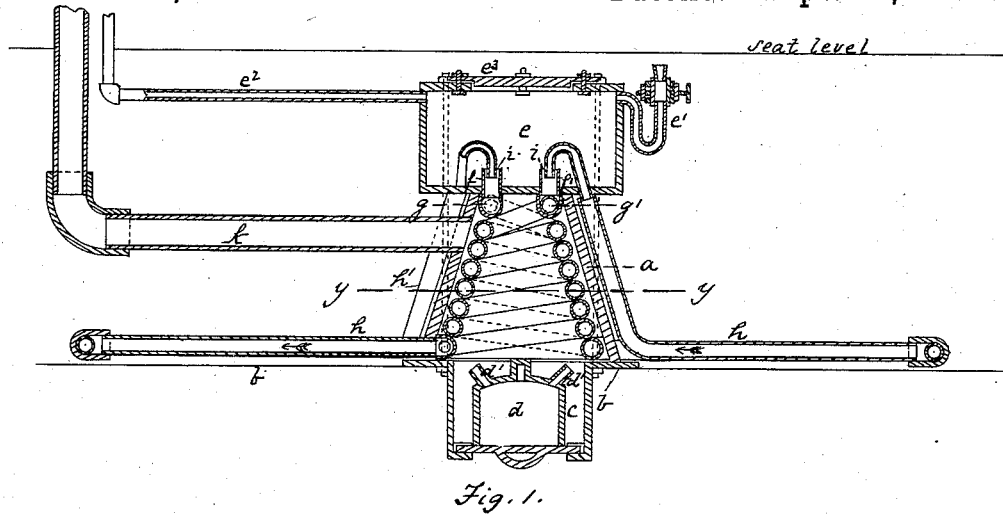
(No Model.)

H. SWINDELL.

HOT WATER HEATING APPARATUS.

No. 264,116.

Patented Sept. 12, 1882.



WITNESSES
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HOT-WATER HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 264,116, dated September 12, 1882.

Application filed December 10, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY SWINDELL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Hot-Water Heating Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of my improved car-heater on line *x x*, Fig. 2, and Fig. 2 is a section on the line *y y* of Fig. 1.

Like letters of reference indicate like parts in each.

To enable others skilled in the art to make and use my invention, I will now describe it by reference to the drawings.

The apparatus consists of a conical casing, *a*, which is bolted to the floor of the car. Below the casing *a*, and in or under the floor *b*, is a casing or box, *c*, for containing the lamp or stove *d*. At the top end of the casing *a* is a water-tank, *e*, placed below the seat-level of the car, and provided with a supply-pipe, *e'*, and with a steam-escape pipe, *e''*, which are secured at or near the top. The supply-pipe *e'* may enter at any level; but the steam-escape pipe *e''* should open near the top. The water-tank has a removable cover, *e'''*, which is suitably packed, and is designed for the purpose of giving access to the interior of the tank. Leading out of the bottom of the tank into the interior of the conical casing *a* are two pipes, *ff'*, each of which is connected with a diagonal coil of pipe, which runs around the interior of the conical casing down to the floor-level of the car. These two coils *g g'* coil into each other diagonally, and together form a conical-shaped water-jacket inside of the conical casing *a*. The lower ends of the coils *g g'* are connected to pipes *h h'*, which run through the sides of the casing *a* in opposite directions, and pass entirely around the car, or the portions thereof which are designed to be heated, and return again to the foot of the casing. They then pass up outside of and parallel to the outer sides of the casing and enter the water-tank *e*. Inside of the tank *e* they each bend over and enter a short distance into the ends of the pipes *ff'*, so as to discharge therein.

The pipes *h h'* are of less external diameter than the internal diameter of the pipes *ff'*, so that where they enter the upper ends of the pipes *ff'* there will be an annular opening, *i*, between them and the inner surface of the pipes *ff'*, in order that the water from the water-tank may enter the coils in addition to the water from the pipes *h h'*. The purpose of this construction is to cause the warm water which circulates in pipes *h h'* to be discharged into the coils *g g'*. After the heating-coils are first filled from the tank the water which is supplied through the annular opening *i* is merely to take the place of that which is lost by evaporation. This economizes the heat, as it is evident that if the coils were supplied from the cold-water tank *e* alone they would be continually chilled, and it would require much more heat to keep up the temperature in the circulating-pipes. The water is heated in the coils by means of a lamp, *d*, placed in the box *c*, having one, two, or any desired number of burners, *d'*. I prefer to have these burners arranged, as shown in Fig. 1, near the outer edge of the top, so that the flame therefrom shall strike upon the coils at their lower end and follow their converging lines to the top. Extending out from the casing *a* near the top is a smoke-pipe, *k*, which is run out through the side or top of the car at any desired point, and which is designed to carry off the smoke and other products of combustion from the lamp.

It will be noticed that the two circulating-pipes run in opposite directions, so that the warm currents of each meet midway of their circuit. In this way the car is kept at an even temperature, the warm part of one pipe being at the cold part of the other. The circulating-pipes may be run around the car in any other direction, either at the ends of the seats or backward and forward under them. As the warm water in the return-coils is discharged into the heating-coils, great economy of heat is obtained. Only sufficient cold water is supplied from the water-tank to replace the amount lost from evaporation. The tank is filled as often as is desirable from the water-supply pipe *e'*. The steam from the coils and the circulating-pipes escaping into the water-tank *e* is condensed therein and tends to raise the

temperature of the supply-water. The evaporation is carried off through the steam-pipe *e*², which, being always open, will prevent any danger from the too great heating of the water and the generation of steam in the pipes.

My improvement is an economical, practicable, and efficient means of heating. An ordinary oil-stove may be used for heating the coils, or any other suitable heating apparatus which it may be desired to use.

I do not confine myself to the mere shape and arrangement of parts shown, as they may be varied considerably in that respect. For instance, the shell *a* may be of cylindrical or polygonal shape. The coils *g g'* need not interlace, as they may be made with a series of return-bends instead of spirals; or one may be smaller than the other and be placed inside of it. The water-tank may, if desired, be placed at another part of the car and be connected with the heating-pipes *g g'* by lengthening the pipes *f f'* and entering the circulating-pipes *h h'* into them through a suitable connection or joint. These examples serve to illustrate the character of the changes that can be made without departing from my invention. The form shown in the drawings is, however, the one I now prefer. This heater can be used in railroad-cars, especially street-cars, houses, rooms, halls, and other places.

If desired, but one coil of pipe with one circulating-pipe may be used; but in that case the advantage of evenness of temperature in all parts of the room or car is not obtained.

I am aware that a steam heating apparatus having steam-generating coils supplied with water from a tank, and circulating-pipes extending from the coils and discharging into the tank, had been devised prior to my invention, and I therefore disclaim it.

I am also aware that steam heating apparatus composed of a heating-tank and circulating-pipes extending from and returning to the heating-tank has heretofore been devised, and do not herein claim such devices; but such device differs from mine *inter alia* by discharging the water from the circulating-pipes into the supply-tank instead of into the heating-coils.

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

1. A heater for railroad-cars, halls, and other places, consisting of a coil or coils of pipe within a heating-cylinder, and connected with a water supply or head, and having a circulating pipe or pipes which return and discharge into the heating coil or coils, substantially as and for the purposes described.

2. A heater consisting of a conical heating-chamber, and two interlacing diagonally-coiled heating-pipes having circulating-pipes which extend from the lower ends of the coils and return and discharge into the upper ends, in combination with a water-supply tank, an annular opening between the tank and pipes, and a suitable lamp or other heating device, substantially as and for the purpose described.

3. The combination of the heating coil or coils of a hot-water heating apparatus with the circulating pipe or pipes discharging thereinto, and a water-supply pipe or channel also discharging thereinto, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 2d day of December, 1881.

HENRY SWINDELL.

Witnesses:

T. B. KERR,
L. C. FITLER.