2 Sheets—Sheet 1.

W. H. KILBOURN.

CAR-HEATER.

No. 188,802. Patented March 27, 1877.

Fig. 1.

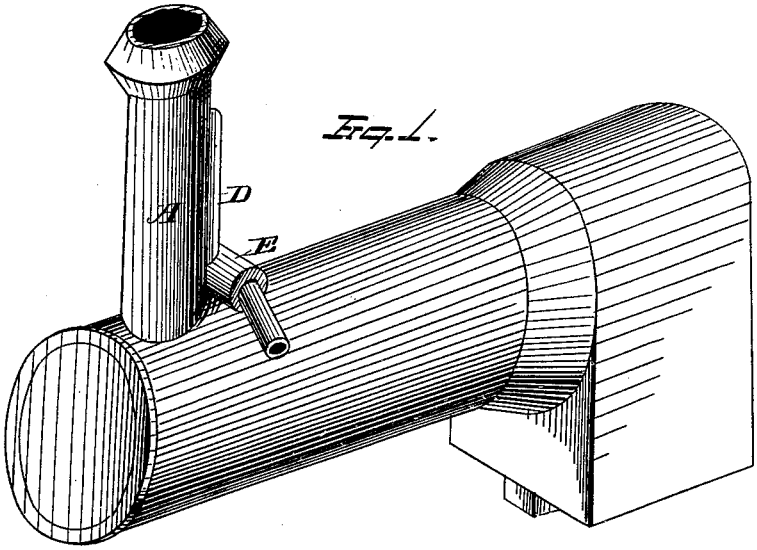
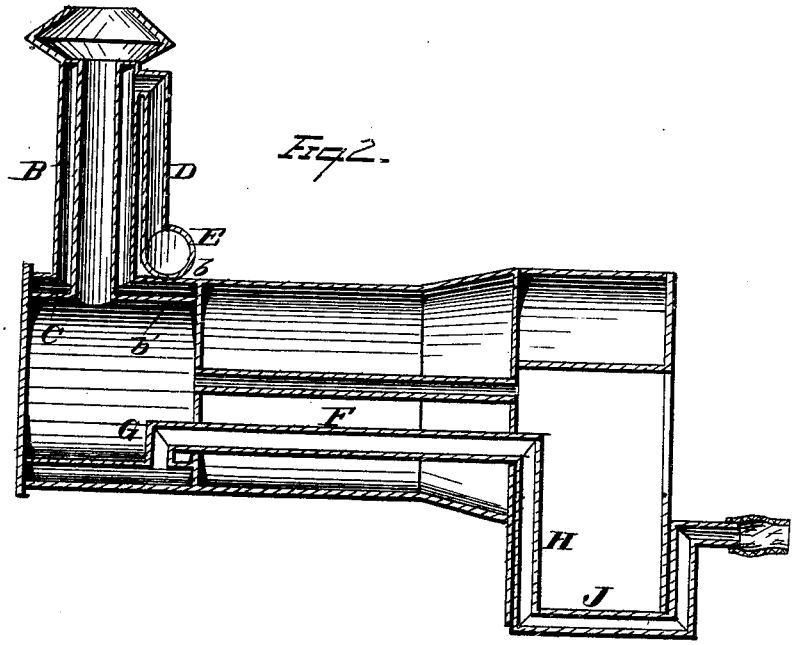


Fig. 2.



WITNESSES

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2 Sheets—Sheet 2.

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CAR-HEATER.

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Fig. 3.

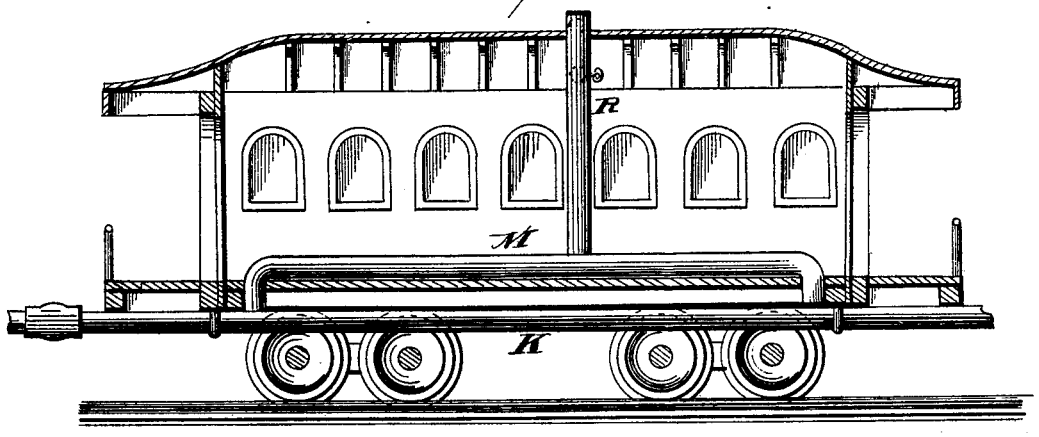
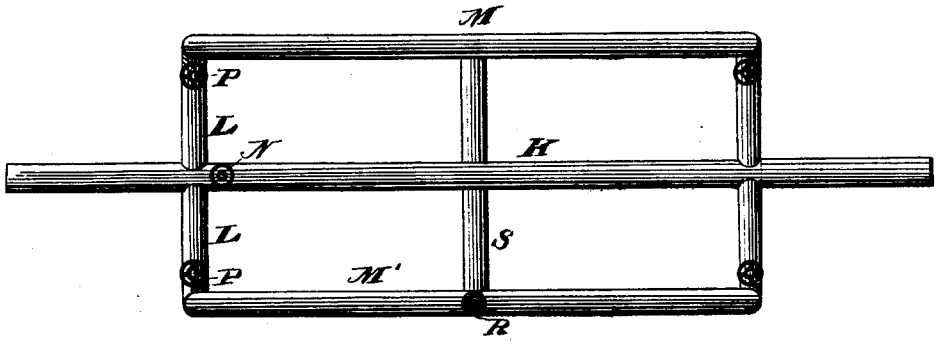


Fig. 4.



WITNESSES

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WASHINGTON H. KILBOURN, OF CORRY, PENNSYLVANIA.

IMPROVEMENT IN CAR-HEATERS.

Specification forming part of Letters Patent No. **188,802**, dated March 27, 1877; application filed February 5, 1877.

To all whom it may concern:

Be it known that I, WASHINGTON H. KILBOURN, of Corry, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Car-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in railroad-car heaters; and is intended to produce a simple mechanism for utilizing the waste heat of the locomotive and cause it to serve as the active cause in heating atmospheric air, which latter is conducted rearward throughout the train.

It consists in forcing atmospheric air through hot-air passages formed in the walls, respectively, of the smoke-stack and smoke-box of a locomotive, and thence, under confinement, into the boiler and fire-box, whence it may be introduced rearward throughout the car-train, whereby the air thus heated may be distributed through heat-radiators located in the several cars.

Referring to the drawings, Figure 1 is a view, in perspective, of a portion of a locomotive embodying my invention; and Fig. 2 is a longitudinal section of the same in a vertical plane, passing through the main air-pipe. Figs. 3 and 4 show the manner of arranging the pipes in a car so that the air current may not pass directly into the latter, but may warm it by heat radiation.

A represents the smoke-stack of any ordinary locomotive, built with double upright cylinders inclosing the annular air-space B, which latter connects in free communication with an air-space, C, formed by making the smoke-box with a double shell, *b b'*. Leading into the upper air-space B, at the top and in the rear of the smoke-stack, is the cold-air feed-pipe D, which extends from a steam air-pump, E, located transversely on the boiler-sheet, just behind the base of the stack. This steam air-pump I have not shown in working detail, since the latter forms no part of my invention, and any suitable mechanism may be used. The atmospheric air is pumped or forced into the feed-pipe D by the steam air-pump drawing the outside air into and through it, up into the said feed-pipe, from which latter the air current descends in annular passage down through the hot-air spaces B C, and empties into the horizontal main boiler-pipe F, by the short connecting elbow-pipe G. This boiler-pipe F is preferably of flat rectangular form, and in greatest cross-dimension about the size of one of the flues of the tubular boiler, for which it is, in fact, substituted; and this pipe, extending longitudinally through the boiler, connects at the rear end thereof with the flat vertical pipe H, which latter continues downward to the bottom of the fire-box, and, preferably, terminates at a point about six inches from the grate-bars. From this point the connecting-pipe may be run around the fire-box or may directly cross the same, as shown by pipe J, and thence, in either instance, lead up on the outer rear surface of the box till in horizontal line with the bed-bottom of the tender. Ball and knuckle joints may engage the several car-sections of the main air-pipe, as the latter is continued rearward throughout the train, so that abundant slack may be given the several pipe-sections, as is necessary under the different motions of the train.

The foregoing description covers the principle of my invention, and it is evident that the hot air thus conducted rearward may be distributed throughout the train by any appropriate means, such as registers, &c., but, preferably, I would not allow the air current itself to pass out from its confined passages into the interior of the cars, and to effect this latter result I make the pipes as shown in Figs. 3 and 4 of the drawings. The main pipe K leads along the central reverse or under side of the car bottom, and is provided at either end with the short transverse connections L extending to either side of the car. These latter empty the air current into the side radiators M M', which extend along the lower longitudinal side walls of the car. I preferably confine the air within these radiators, and allow it to heat the car simply by radiation, instead of direct atmospheric contact, and these radiators are, preferably, about a foot high, extending vertically from the bottom of

the car, and continued in longitudinal dimension throughout the length of the same. They may, if desired, connect with pipes leading around heaters placed in the cars, and the air be thus caused to pass through the longitudinal radiators M M′, thence about heaters, and finally empty into the main central pipe K. A double connecting mechanism may be provided at this latter point, if desired, so that the heated air current may be passed in reverse passage through the main pipe K in the same car, or may be conducted into the next car-section of this main K rearward in line of the train. An air-valve N, is placed at the junctions of this main pipe K with the short transverse connections L, so that the air current may be caused to pass onward through the main or switched off into the radiators. So, too, valves P may be located at either end of the two side radiators, which cut off or open their connection with the side feed-pipes L.

R is an air-exit pipe leading from one of the radiators up through the car-roof, and is provided with a damper, which, upon being open or shut, respectively, causes or prevents a constant draft throughout the several air-pipes. At its junction with the radiator a cross-pipe, S, connects therewith, while its other end connects with the opposite side radiator, and thus means is afforded for conducting the hot air in reverse passage back toward its feeding source.

This exit-pipe is only in use or of service when the car in which it is located is the last or rear car in the train, as my object is to cause the hot air to be led without escape through the entire length of the train.

It is apparent that a pipe having a funnel-shaped opening may be placed in the front of the locomotive, just beneath the head-light, if desired, which pipe may connect with the air-pump, so as to lessen the amount of steam energy necessary to feed the hot-air pipes, since, when the train is in motion, the driving-force of the locomotive against the atmospheric pressure will cause a large amount of air to be thus conducted, by means of the funnel and its pipe, rearward into the air-pump. With a steam air-pump and connecting means, made as described, it might be unnecessary to provide a second air-pump to feed the air-braking mechanism, since a connection could easily be made with the main pipe K, which would supply the air-chamber used in air-braking with a sufficient quantity of air to operate the brakes.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In railroad-car-heating apparatus, the smoke-stack of a locomotive having a hot-air passage formed in its side wall, substantially as described.

2. In a railroad-car-heating apparatus, a locomotive whose smoke-stack and smoke-box have annular hot-air passages formed in their respective side walls, substantially as and for the purpose described.

3. In railroad-car heaters, the combination of a steam air-pump and connecting mechanism with the smoke-stack and smoke-box of a locomotive, both the latter constructed with double-shell cylinders, forming hot-air passages in their respective side walls, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of February, 1877.

WASHINGTON H. KILBOURN.

Witnesses:

C. G. HARMON,

CHAS. W. YOST.