(No Model.) 2 Sheets—Sheet 1.

E. ANDREWS.

CAR HEATER.

No. 384,599. Patented June 19, 1888.

Fig. 1.

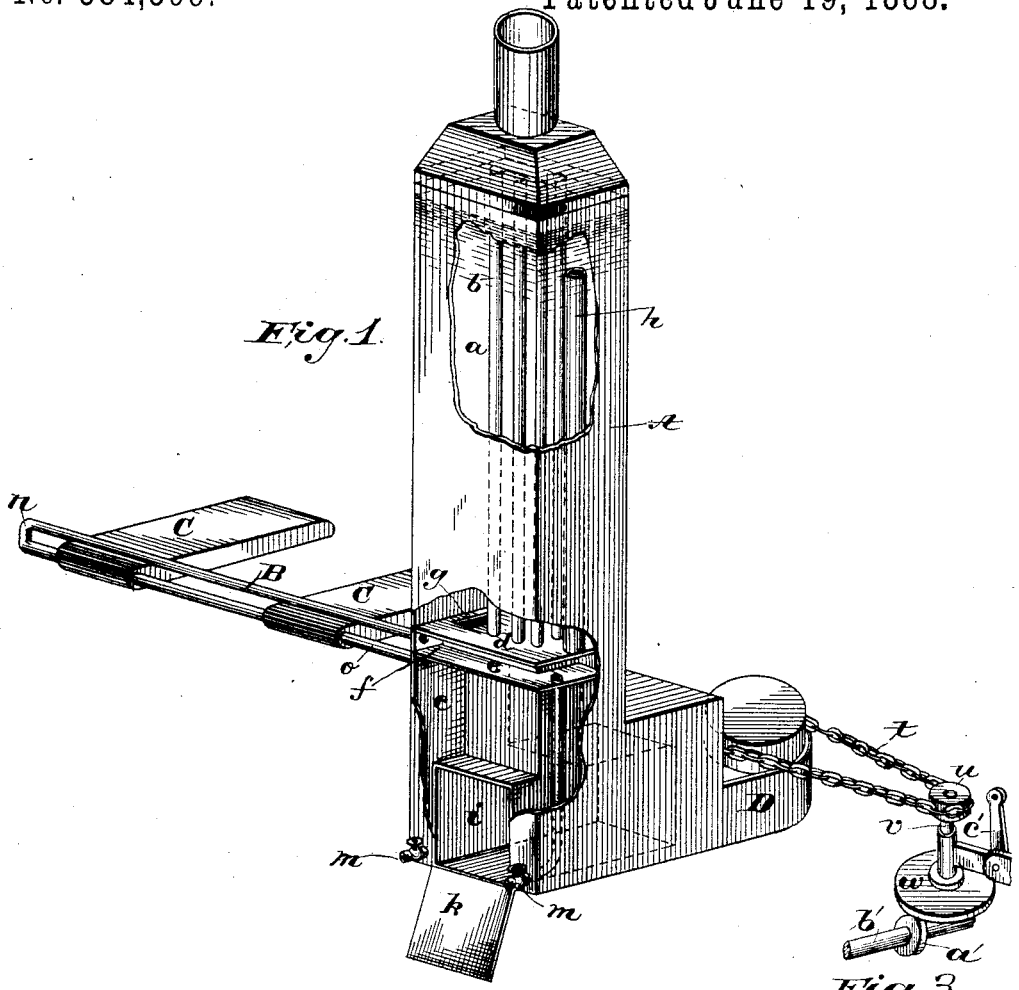


Fig. 2

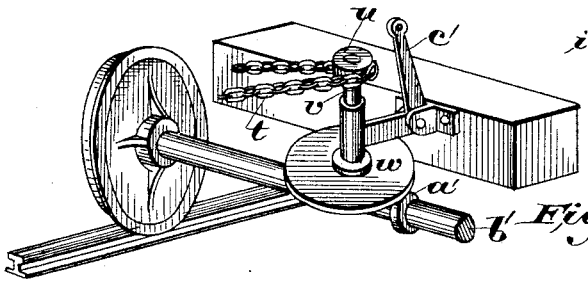


Fig. 3

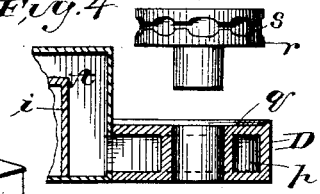
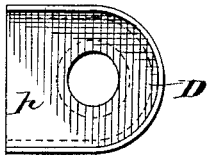


Fig. 4

Fig. 5



Witnesses:
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Wm. E. Doyle

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(No Model.) 2 Sheets—Sheet 2.

E. ANDREWS.

CAR HEATER.

No. 384,599. Patented June 19, 1888.

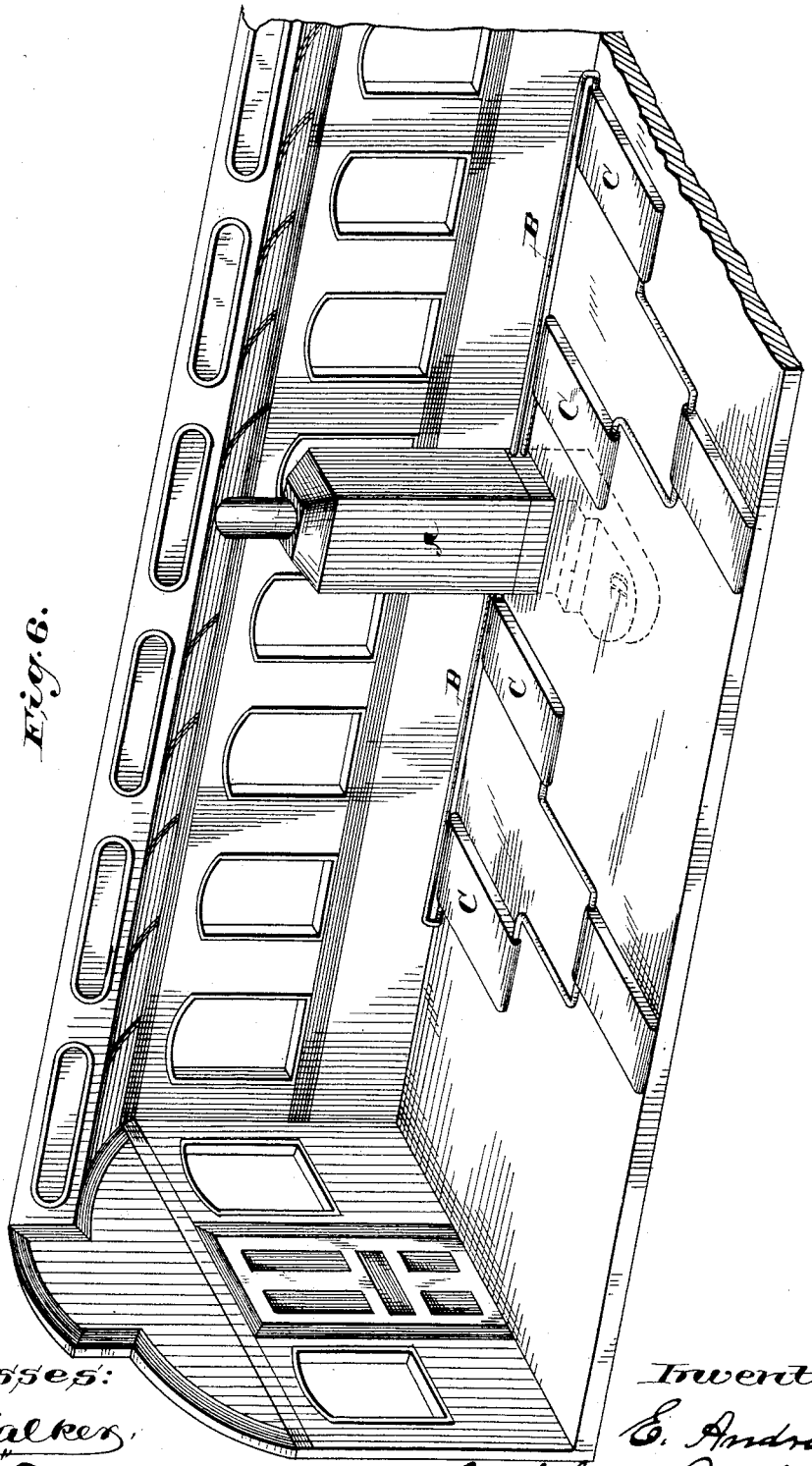

Fig. 6.

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UNITED STATES PATENT OFFICE.

EDWARD ANDREWS, OF POTTSVILLE, ASSIGNOR OF ONE-HALF TO ALFRED S. SEAMAN, OF FRACKVILLE, PENNSYLVANIA.

CAR-HEATER.

SPECIFICATION forming part of Letters Patent No. 384,599, dated June 19, 1888.

Application filed October 26, 1887. Serial No. 253,414. (No model.)

To all whom it may concern:

Be it known that I, EDWARD ANDREWS, a citizen of the United States, residing at Pottsville, in the county of Schuylkill 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 appertains to make and use the same.

My invention relates to means for heating passenger railway-cars, and has for its object the construction of a device for circulating hot water through a system of pipes and foot-warmers and returning the cooled water to the boiler to be reheated.

Many of the most serious results of railroad-collisions, derailment of cars, and other similar accidents are produced by the cars being set on fire from the heating apparatus. It is my purpose to provide a car-heater in which no fire shall be kept up while the train is in motion making a trip or run.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a perspective of the heater with a portion of the outer case broken away; Fig. 2, a like view of the gearing for propelling a friction-disk. Figs. 3, 4, and 5 are details of the friction-heater, and Fig. 6 is a perspective of the interior of a car with my improved heater applied.

Reference being had to the drawings and the letters marked thereon, A represents the circulating-reservoir, which consists of an upper section or chamber, *a*, through which the fire tube or tubes *b* pass, and is separated from the lower chamber, *c*, by two horizontal plates, *d e*, between which is formed an intermediate chamber, *f*. The upper chamber, *a*, and the lower chamber, *c*, communicate through a passage, *g*, and the upper and intermediate chambers communicate through a pipe, *h*, which extends to nearly the upper end of said chamber *a* and passes through the upper horizontal plate, *d*.

The reservoir being constructed in separate sections, each section may be cleaned independently of the others, and worn portions of one section may be replaced without detaching or disturbing the others, and by the construction shown the hottest water is delivered to the system of heating-pipes in the car, while the coolest water is delivered in the lower portion of the reservoir, where the water is at its lowest temperature.

Within the lower chamber, *c*, is a fire-pot or furnace, *i*, provided with a door, *k*, and is surrounded on its sides and top by water, which is supplied through pipes *m*.

B is the hot-water-conducting pipe, which communicates with the intermediate chamber, *f*, and extends out through any desired portion of a car, forms a return-bend at *n*, and communicates with a series of enlarged chambers, C, which are placed between or under the seats of the car, and constitute foot-warmers.

The chamber C may be placed on both sides of the car, as shown in Fig. 6, and extend from both sides of the circulating-reservoir. From the chamber C, next to the reservoir A, connection is made with the lower chamber, *c*, of said reservoir by means of a pipe, *o*.

The chambers C should be raised from the floor of the car about one-half of an inch to admit of a circulation of air under them.

To provide for keeping up the circulation of the water in the heating system, I have provided an extension, D, to the lower part of the circulating-reservoir A, which is in communication with the chamber *c*, and is provided with a passage, *p*, through which the water circulates.

On the upper side of the extension D is formed a seat, *q*, upon which rests a disk, *r*, which is provided with a peripheral groove, *s*, for the reception of a driving-chain, *t*, which connects with a pulley, *u*, on a shaft, *v*, which also supports a friction-disk, *w*, engaging with a wheel, *a'*, on the axle *v'* of a car. The disk *w* is thrown into and out of contact with the wheel *a'* by a bell-crank lever, *c'*, attached to the bolster or frame of the car or truck.

The disk *r* and its seat *q* may be made of chilled cast-iron to increase their durability. By putting the disk *w* into engagement with the wheel *a'* on the axle *b'* the motion of the car is employed to operate the friction-disk *r* and generate heat, which is transmitted to the

water in the lower section, *c*, of the circulating-reservoir A, and maintains the heat and circulation of the water when the train is in motion.

The friction-heater may be run by a separate motor or any other suitable means, as I do not limit my invention to any specific means of operation.

To provide for maintaining the heat of the water when the train is not in motion, fire may be made in the furnace *i*.

The reservoir A and all of the pipes and chambers C may be filled with hot water at a temperature of about 212° at stations along the road, if desired; or the water may be heated to about the same degree in the reservoir while the train is being "made up" preparatory to starting on a trip.

In applying the heater to a car the fire-pot or furnace is below the floor, and all of that portion below the floor, including the operating mechanism for the friction-heater, should be incased in sheet metal, while the upper portion of the circulating-reservoir throws off the heat of the water by radiation into the car.

In practice the temperature of the water will be maintained at about 150°, which, by the use of the foot-warmers for passengers to place their feet upon, will be sufficient to keep the car at a comfortable temperature.

Having thus fully described my invention, what I claim is—

1. A car-heater provided with an upper and lower water-chamber and a side passage connecting said chambers, in combination with an intermediate chamber communicating with the upper part of the upper chamber, and with a system of heating-pipes provided with a series of hollow connected flat mats or foot-warmers arranged on the floor of a car, substantially as described.

2. A car-heater provided with upper and lower connected water-chambers, a fire flue or flues passing through the upper chamber, and a furnace in the lower chamber communicating with the flues in the upper chamber, in combination with an intermediate water-chamber connected with the upper part of the upper chamber, and a system of heating-pipes provided with a series of hollow connected foot-warmers arranged on both sides of a car, and a return-pipe communicating with the lower section of the reservoir, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD ANDREWS.

Witnesses:
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WM. E. DYRE.