2 Sheets—Sheet 1.

F. E. ENSIGN.

Car-Heater.

No. 208,013. Patented Sept. 17, 1878.

Fig. 1.

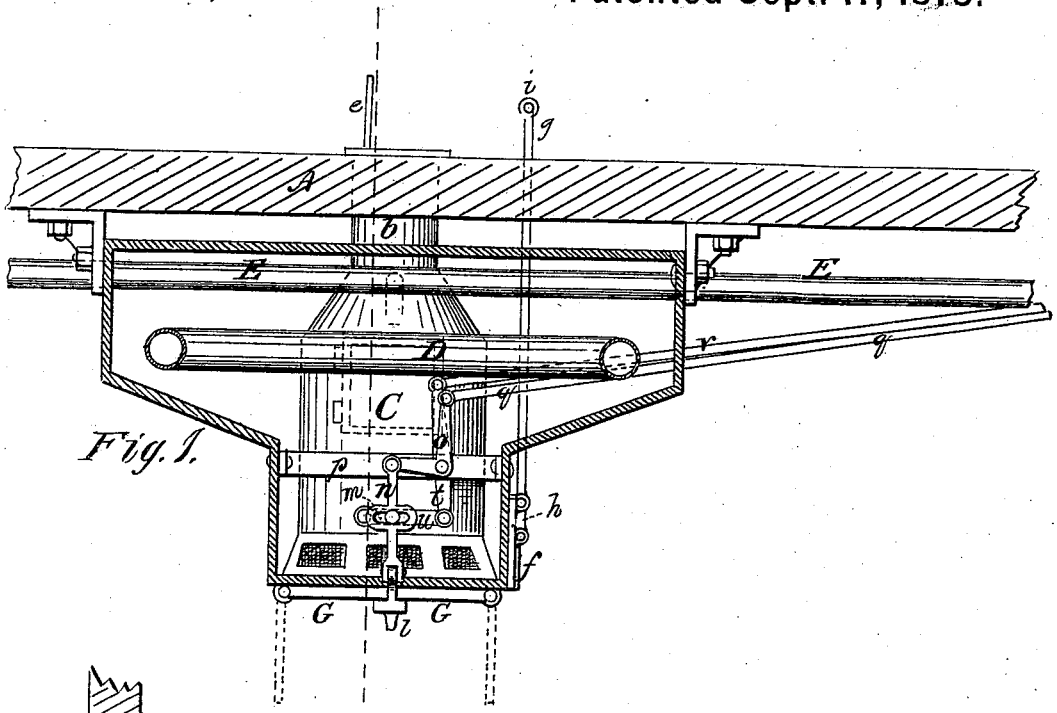
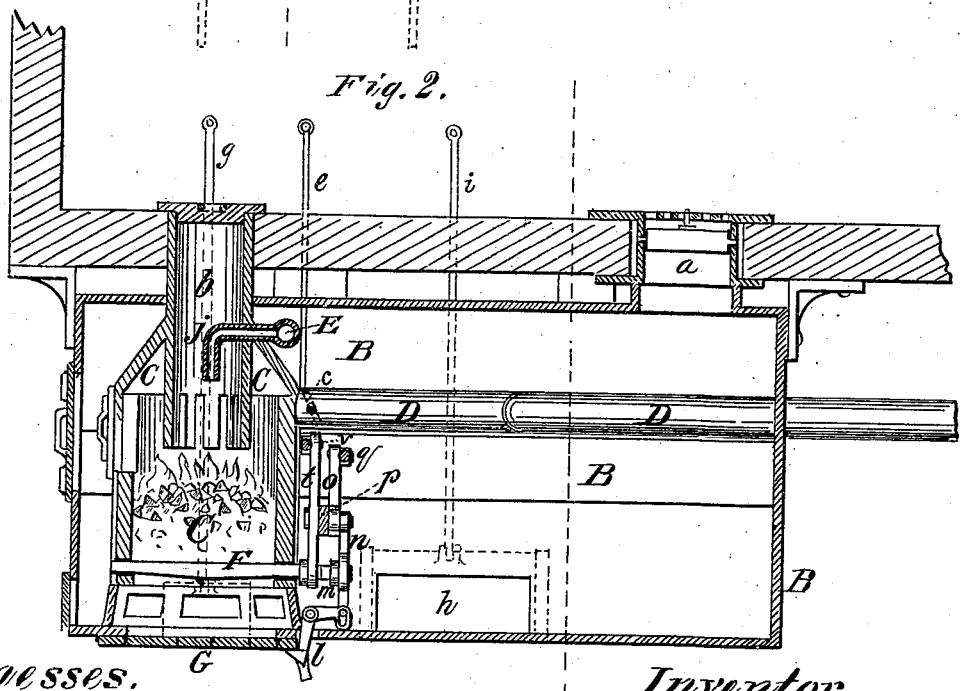


Fig. 2.



Witnesses.

Chas. J. Gilmore.

Alfred Shedlock.

Inventor

Frank E. Ensign.

per E. H. Johnson,

Attorney

2 Sheets—Sheet 2.

F. E. ENSIGN.

Car-Heater.

No. 208,013. Patented Sept. 17, 1878.

Fig. 3.

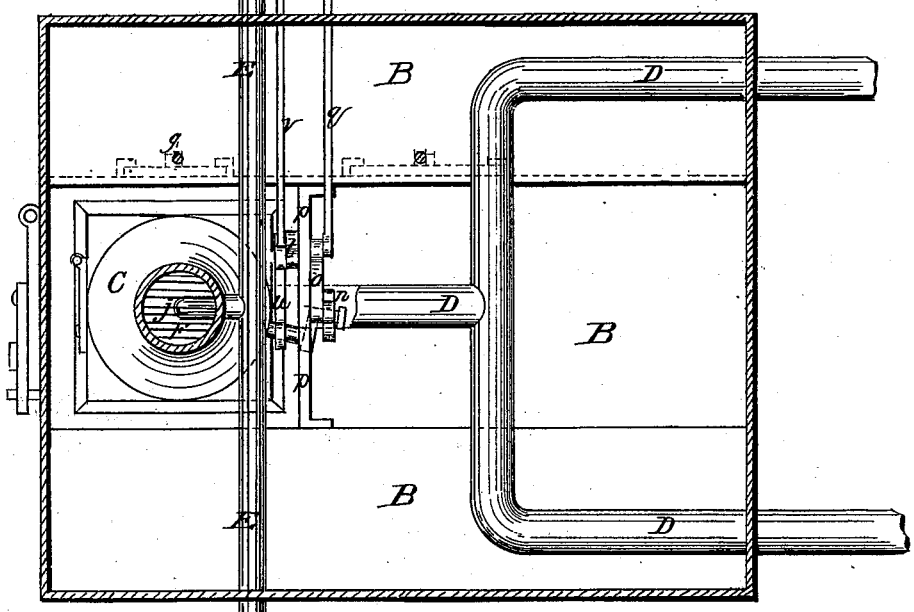
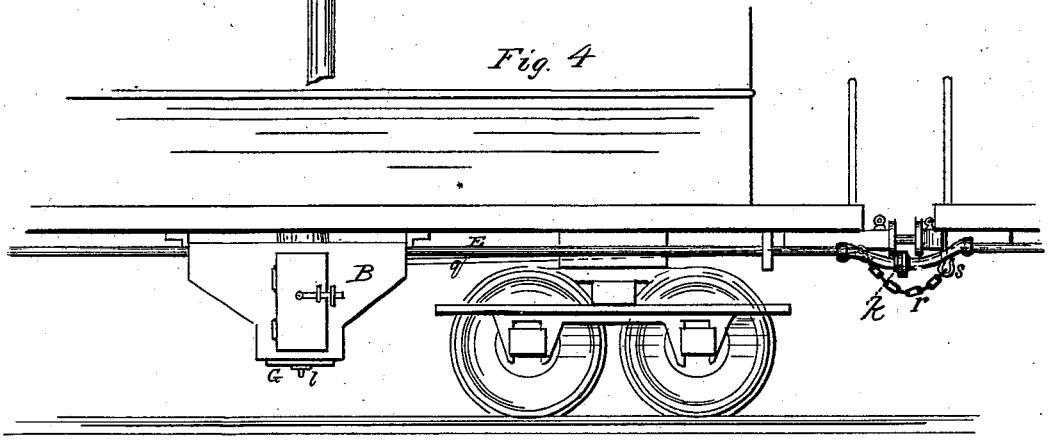


Fig. 4



Witnesses,
Chas. J. Gilmore.
Alfred Shedlock.

Inventor
Frank E. Ensign
per E. N. Johnson,
Attorney.

UNITED STATES PATENT OFFICE.

FRANK E. ENSIGN, OF NORTH GRANVILLE, NEW YORK.

IMPROVEMENT IN CAR-HEATERS.

Specification forming part of Letters Patent No. **208,013**, dated September 17, 1878; application filed September 24, 1877.

To all whom it may concern:

Be it known that I, FRANK E. ENSIGN, of North Granville, county of Washington, and State of New York, have invented certain Improvements in Car-Heaters, of which the following is a specification:

My invention relates to car-heaters, and consists in a novel construction, combination, and arrangement of parts; and it has for its objects to provide means by which, in case of accident to the cars, the fires in the heaters of all the cars are dropped from the heaters, and also a means by which the fires in said heaters may be immediately quenched by the engineer or other person. It also has for its object to provide means by which the appurtenances of the furnace and hot-air chamber may be manipulated from the interior of the car or from the platforms thereof, as will be fully hereinafter set forth.

In the drawings, Figure 1 is a vertical transverse section. Fig. 2 is a vertical longitudinal section. Fig. 3 is a plan view. Fig. 4 shows the manner in which the heater is applied and operated.

A represents the floor of the car. B is the hot-air chamber, situated underneath the car, being attached to the flooring by knees, as shown. This chamber connects with the interior of the car by the register *a*, through which the heated air passes. C is the heater or furnace, situated inside the hot-air chamber. It may be of any suitable shape and size, but, as shown in the drawings, consists simply of a cylinder supported on a square base, which rests on the floor of the hot-air chamber. This heater may be supplied with coal from the interior of the car through the hopper *b*, by filling up which the heater may be made to act as a self-feeder. D is the smoke-flue, proceeding from the stove and branching out, as shown, whereby the heating-surface in the chamber is extended. The heating-surface may, however, be otherwise extended, and increased by flues, flanges, &c., in a manner generally well known among manufacturers of heating-furnaces. *c* is a damper in the flue D, which damper is operated from within the car by means of the rod *e*, which passes through the flooring, as shown. *f* is the draft-regulator, which may be operated similarly to the damper by the rod *g* passing into the car. *h* is a valve or gate for regulating the flow of air into the hot-air chamber. A rod, *i*, attached to this valve, passes into the car, similarly to the draft-regulator rod, by which it may be operated. These valves, regulators, and dampers may be differently constructed and situated, I having shown them in the drawings in their simplest form.

E is a pipe running under the car, and passing through the heating-chamber immediately behind and above the stove or heater; and from this pipe a branch pipe, *j*, projects into the heater, its end being bent downward, as shown in Fig. 2. The pipe runs the whole length of the car, and is connected between cars by a suitable coupling, *k*, as shown in Fig. 4, and is likewise connected with the water-tank of the engine-tender, or, if necessary, with a cock from the boiler of the engine, so that an abundant supply of water can be let or forced into it and the furnaces, thereby immediately extinguishing the fires therein.

The circular dumping-grate F of the furnace is shown constructed and operating as usual, having bearings in the lower part of the stove, as shown. The floor of the ash-pit consists of two doors or wings, G G, hinged so as to swing down and apart, as shown in dotted lines in Fig. 1. These doors are supported by the catch *l*, as shown. The rear pivot or trunnion of the grate F is extended and provided with a crank, *m*, the pin of which is embraced by a yoke on the rod *n*, the lower extremity of which rod is provided with a pin, which enters a slot in the horizontal arm of the catch *l*, while its upper extremity is pin-jointed to a bell-crank lever, *o*, (pivoted to the bar *p*,) the vertical arm of which lever is pivoted to the rod *q*, which passes through the heating-chamber under and to the end of the car, where it is attached to the next car by the chain and hook *r s*, as shown in Fig. 4. At any point along this rod it may be jointed to a bell-crank lever, a rod from which may pass through the flooring of the car or the platform thereof, so as to be operated by the brakeman or others from within the car or on its platform, as will be readily understood.

It will be seen that when the rod is pulled it will, through the bell-crank lever *o*, draw

up the rod *n*, which, acting on the crank *m* of the grate, would upset the same, and simultaneously trip the latch *l*, thus allowing the doors G G of the ash-pit to fall and the fire to be dumped.

t is a lever, pivoted to the bar *p*. To its lower extremity is jointed one end of the arm or link *u*, the other end of which is formed into an eye or loop, which embraces the pivot or trunnion of the grate. To the upper extremity of the lever is jointed the rod *v*, which passes out of the hot-air chamber under the car for any desired length, and is jointed to a bell-crank lever, (not shown,) by which reciprocating motion may be imparted to it from within the car or on the platform thereof. A reciprocating motion of this rod will, of course, be imparted to the grate of the furnace, and thus the fire may be shaken, the yoke in rod *n* allowing the play of the crank-pin.

The slot in the horizontal arm of the latch *l*, which supports the doors of the ash-pit, allows of such latch being pushed back for the purpose of dumping the ashes, &c., without interfering with the mechanism before described.

With the above construction and arrangement of parts, whenever an accident occurs in which the cars break their couplings, the rod *q* is immediately jerked and the fire in the furnaces dumped, as before described; or, should the engineer foresee unavoidable danger ahead, he may, by turning on water into the pipes E, immediately extinguish all the fires; or the rods *q* may be so connected with the engine that he may dump the fires.

I do not confine myself to the precise construction and arrangement described and shown, it being one of the simplest forms in which the invention may be embodied.

I claim—

1. The combination, with a car-heater, of a pipe provided with flexible connections and couplings for connecting it to the boiler or water-tank of a locomotive or its tender, directly or through intermediate cars, whereby the fire in said heater may be extinguished by water from the locomotive or tender, constructed and operated substantially in the manner described and specified.

2. The combination, with the furnace C, having a dumping-grate, F, of a mechanism, substantially as described, for operating it, and a connector, *q r*, for connecting said operating mechanism with the adjoining car, whereby the grate may be dumped by the breaking asunder of the cars, substantially in the manner described and specified.

3. The combination, with the furnace C, dumping-grate F, bell-crank lever *o*, rod *n*, and rod *q*, provided with chain *r* or other flexible connection, constructed and operating substantially in the manner described and specified.

4. The combination of the doors G G, latch *l*, rod *n*, and rod *q*, constructed and operating substantially in the manner described and specified.

5. The combination of the furnace C, dumping-grate F, ash-pit doors G G, crank-arm *o*, rod *n*, and rod *q*, constructed and operating substantially in the manner described and specified.

6. The combination of the grate F, link *u*, lever *t*, and rod *v*, constructed and operating substantially in the manner described and specified.

FRANK E. ENSIGN.

Witnesses:
MARK VAIL,
SIDNEY ROBBINS.