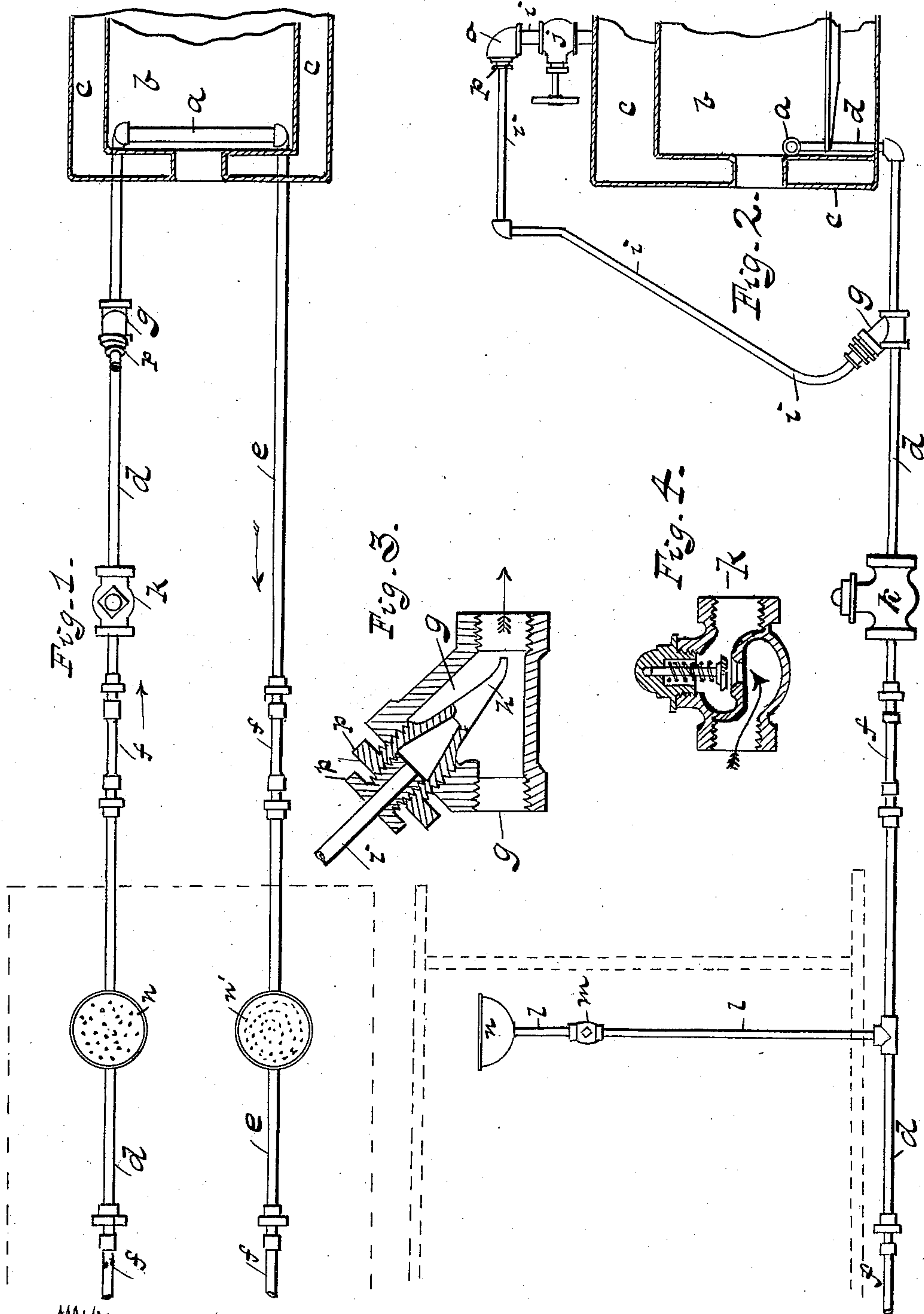


(No Model.)

C. L. KLINE.
SYSTEM OF CAR HEATING.

No. 387,722.

Patented Aug. 14, 1888.



Witnesses:
H. C. Harrison.
J. A. Keenon.

Inventor.
Charles L. Kline.
By O. D. Lewis.
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES L. KLINE, OF STEUBENVILLE, OHIO.

SYSTEM OF CAR-HEATING.

SPECIFICATION forming part of Letters Patent No. 387,722, dated August 14, 1888.

Application filed March 5, 1887. Serial No. 229,872. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. KLINE, a citizen of the United States, residing at Steubenville, in the county of Jefferson and State of Ohio, have invented certain new and useful Systems for Car-Heating; 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 the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a means for heating railway-cars, the object being to provide a device whereby heated air may be supplied to cars in such quantities as to avoid the use of stoves, and thereby prevent the cars taking fire in case of a wreck. This I accomplish by means of a current of air conducted through suitable pipes through the fire-box of the engine and carried back to and discharged into the cars, together with certain other details of construction and combination of parts, as will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a plan view, in detail, of my improved car-heater constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detailed sectional elevation of the injector used for creating a current of air through the apparatus. Fig. 4 is an enlarged detailed sectional view of the check-valve.

To put my invention into practice, I provide a short section of pipe, *a*, and place the same in a suitable position in the fire-box *b* of a locomotive-boiler, *c*. From each end of this pipe *a*, I conduct pipes *d* *e* beneath the cars, extending the entire length of the same, and provided with suitable flexible couplings, *f*, whereby the cars may be detached when desired. At a short distance back of the pipe *a*, in the fire-box *b*, I place an injector, *g*, of simple construction, with the nozzle or discharge end *h* toward the fire-box *b*. This injector *g*, I connect to the boiler *c* by a suitable pipe, *i*, having a valve, *j*, placed near or within reach

of the engineer. On the same line of pipe *d* to which the injector *g* is attached I place a check-valve, *k*, which will prevent any backward flow of the air traveling through the same. At each end of the cars I erect perpendicular branch pipes *l* from each of the parallel lines, each provided with a valve, *m*, and perforated globe *n*. The injector *g* and elbow *o*, above the valve *j*, I provide with a suitable number of reducing-glands, *p*, for the purpose of increasing or diminishing the size of the steam-pipe *i*.

In operation the valve *j* above the boiler *c* is opened, which supplies steam to the injector *g*, which, in discharging the same from the nozzle *h*, has a tendency to create a vacuum behind the exit, and compels the air entering through the globes *n*, attached to the pipe *l*, to travel through the heated pipe *a* in the fire-box *b*, passing along through the connecting-pipe *c*, finally escaping through the globes *n'*, attached to the same, into the cars, which operation is practically taking the air from the cars, conducting the same through the heated drum *a* in the fire-box *b* and conducting the same back to the cars.

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

The combination, with the boiler and fire-box of a locomotive, of a pipe within the latter, pipes *d* and *e* connected to the ends of the said pipe in the fire-box, a pipe, *i*, communicating with the steam-space of the boiler, provided with a regulating-valve, an injector connected to the said pipe *i*, and also to the pipe *d*, a stand-pipe provided with a globe, *n*, communicating with pipe *d*, a check-valve, *k*, applied to said pipe *d*, and a stand-pipe provided with a globe, *n'*, applied to pipe *e*, substantially as specified.

CHARLES L. KLINE.

Witnesses:

JOSEPH F. KLINE,
M. E. HARRISON.