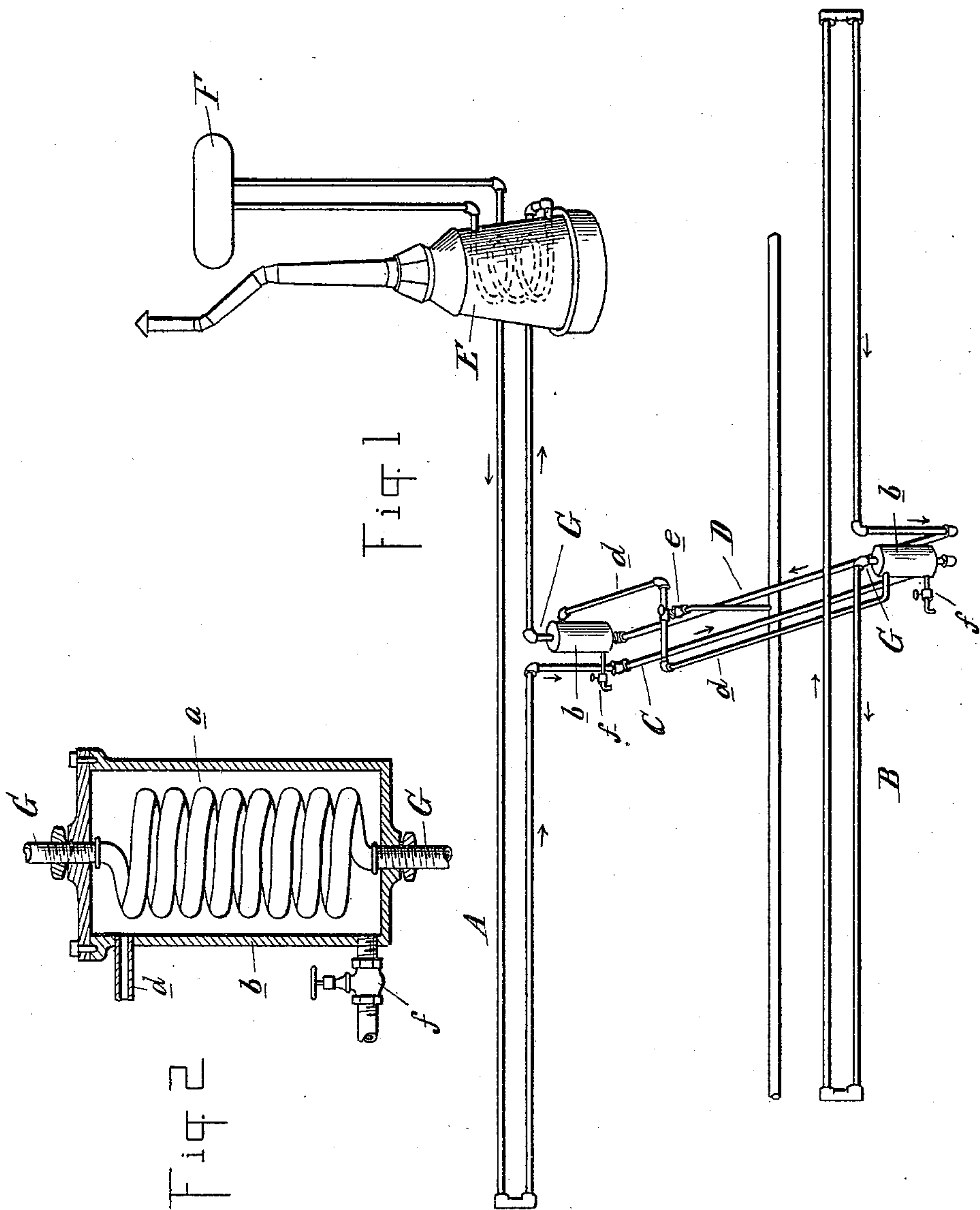


(No Model.)

F. P. FOLEY.
CAR HEATING APPARATUS.

No. 440,891.

Patented Nov. 18, 1890.



Witnesses:
P. M. Hulbert
N. S. Lindop.

Inventor:
Frank P. Foley
By *Mos. S. Magne* Atty.

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UNITED STATES PATENT OFFICE.

FRANK P. FOLEY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR HEATING COMPANY, OF WHEELING, WEST VIRGINIA.

CAR-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 440,891, dated November 18, 1890.

Application filed April 7, 1890. Serial No. 346,816. (No model.)

To all whom it may concern:

Be it known that I, FRANK P. FOLEY, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Car-Heating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in car-heating apparatus; and the invention consists in the peculiar application of a steam-heater to the "cross-over" pipes connecting the two sides of the car, whereby the water is circulated in a most expeditious manner and the heat is most evenly distributed, all as more fully hereinafter described.

20 In the drawings, Figure 1 is a diagram perspective view of my improved heating apparatus. Fig. 2 is a vertical section through one of the heaters.

A and B are the circulating-pipes upon the two sides of the car, connected by the so-called "cross-over" pipes C D.

25 E is a heater for heating and causing a circulation of the water in the pipes should the steam in the train-pipes be shut off. This heater may be but is not generally used in connection with the steam-supply from the engine, but generally is used only on occasions when the car is detached.

F is the expansion-drum, all of known and usual construction.

35 The cross-over pipes are connected to the side radiators by the vertical portion G. In such car-heaters trouble has been experienced with freezing of these cross-over pipes, as they are at the lowest point of the system, and the return cross-over pipe B being about the coldest point in the system, both being exposed to the weather. In applying steam-heaters to such apparatus in the past it has usually been done by placing them in the vertical portions of the piping within the car,

which brings the cross-over at the lowest point of the system—the coldest and most exposed point of the system. It is also in the cross-overs where the circulation has usually been found to be retarded.

50 To overcome these difficulties I have devised my improvement, which consists in forming a vertical coil *a* in the vertical portion of the portion G of the pipe, connecting the radiator with the cross-over, and surrounding this coil with a steam-casing *b*, to which steam is supplied by the steam-supply pipe *d*, connecting to the train-pipe, and having a valve *e*, common to both casings, controlling said pipe. These casings are provided with suitable drip-valves *f*, through which the water of condensation escapes to the ground.

60 These heaters I apply one to each cross-over and in such relation to the cross-over and the circulation that they will be in that vertical portion G through which the water rises in its circulation, so that the heater will not act to retard, but, on the contrary, to assist in the direct course of the circulation. This requires that they shall be placed upon diagonally-opposite vertical portions of the cross-over, as plainly shown in Fig. 1.

The course of the circulation is shown by the arrows.

What I claim as my invention is—

75 In a car-heating apparatus, the combination, with the circulating-pipes and train-pipes, of cross-over pipes D C below the circulating-pipes, vertical coils formed at the ends of the cross-over pipes, casings around the coils, pipes leading into said casings from the train-pipe, and drip-valves in the bottom of the casings, substantially as described.

80 In testimony whereof I affix my signature, in presence of two witnesses, this 25th day of March, 1890.

FRANK P. FOLEY.

Witnesses:

JAMES H. SEWALL,
SAMUEL K. ANDERSON.