

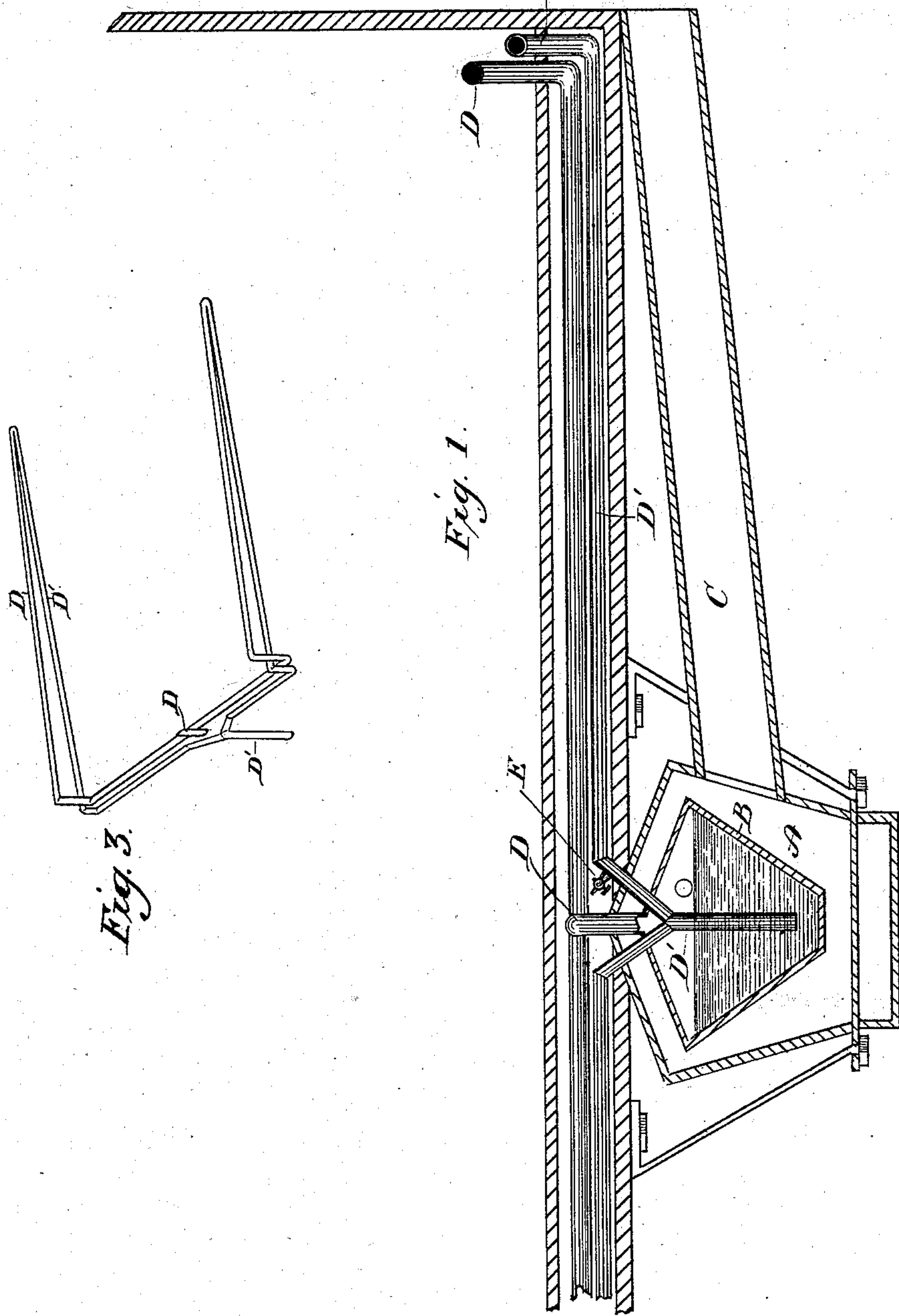
(No Model.)

2 Sheets—Sheet 1.

N. SLINGLAND.  
RAILWAY CAR STEAM HEATER.

No. 284,250.

Patented Sept. 4, 1883.



Witnesses  
S. S. <sup>Wm</sup>son  
W. P. Haviland.

Inventor  
Nicholas Slingland.  
By Attys.  
Worster & Smith.

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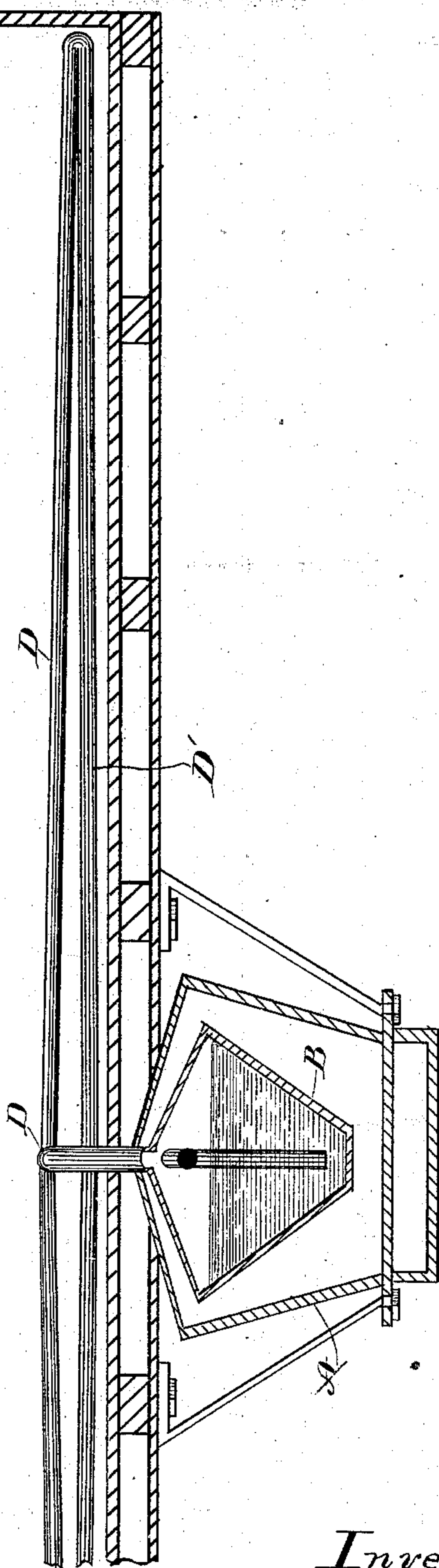
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*Fig. 2.*



*Witnesses*  
*S. S. Wrenson*  
*W. P. Haviland.*

*Inventor*  
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*Wooster Smith*



# UNITED STATES PATENT OFFICE.

NICHOLAS SLINGLAND, OF FALLS VILLAGE, CONNECTICUT.

## RAILWAY-CAR STEAM-HEATER.

SPECIFICATION forming part of Letters Patent No. 284,250, dated September 4, 1883.

Application filed April 20, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, NICHOLAS SLINGLAND, a citizen of the United States, residing at Falls Village, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Steam-Heating Apparatus for Railway-Cars; 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 certain novel and useful improvements in steam-heating apparatus for railway-cars.

Heretofore car-heaters have been constructed in which the stove has been hung beneath the middle of the car, and steam-pipes led from the boiler up into the car, and then, at a slight angle of inclination from the floor, they have been run to the end of the car and there plugged or otherwise sealed and the waters of condensation left to flow down the incline of the pipe back into the boiler. In devices of this description the steam pipes have been enlarged at the ends, in order to give more heating-surface at that particular part of the car. The great disadvantage in an apparatus constructed in the above manner is that the waters of condensation are not only retarded in their retrograde course to the boiler, but often kept back altogether by the current or flow of the steam, which is mainly due to the defective circulation.

My invention has for its object to provide a complete circulation of steam, while at the same time the waters of condensation shall find a ready exit from the pipes back into the boiler; and with these ends in view my invention consists in certain details of construction and elements of combination hereinafter fully and in detail explained, and then specifically designated by the claims.

In order that those skilled in the art to which my invention appertains may more fully understand its construction and operation, I will proceed to describe the same in detail, referring by letter to the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows a cross-section of a car with my improvement attached; Fig. 2, a longitudinal section of the same, and Fig. 3 a perspective illustrating my improved apparatus.

Similar letters denote like parts in the several figures.

A is the fire-pot, and B the boiler. C is a chute through which fuel is fed. D is a steam-pipe proceeding from the top of the boiler up into the space between the two floors of the car, thence to the sides thereof and up into the car itself, as will be readily seen by reference to Figs. 1 and 3, the upper end of this section of pipe being the highest point in the circulatory system. Thence the pipe is run on a slight declination through the length of the car, bent around and returned on about the same declination, reaching the vertical section of pipe at about the level of the floor, and continued down, in the direction shown at D', between the two floors of the car into the boiler again, as seen more particularly at Fig. 3, the pipe D' being brought down below the surface of the water in the boiler, and nearly to the bottom thereof, for the purpose presently explained, and as shown at Fig. 1. This pipe D is declined, as shown, in order that the waters of condensation may readily flow by gravity into the pipe D', which latter is extended, as shown, nearly to the bottom of the boiler, in order that the said waters shall not be diffused at the upper surface of the water in the boiler, and thereby cool the same and condense the steam as it rises, which is a great advantage, since the said waters are thus conveyed close to the source from which the water in the boiler receives its heat, and the temperature of the latter is not materially lessened. The same result may be accomplished by leaving the waters of condensation outside of the boiler and introducing them into the latter at the bottom thereof; but the former method is better, since the radiation of heat is thereby prevented. I have shown a small petcock, E, on the pipe D', just above the boiler. By means of this cock the air in the boiler finds an outlet whenever the boiler is refilled. It will thus be readily understood that a complete circulation of steam is effected, while at the same time the condensed waters cannot remain in the pipes, which is a great advantage in devices of this construction. Owing to the rapidity of circulation thus attained, I am enabled to secure a greater amount of heat with much smaller pipes than have heretofore been necessary. Both pipes being above the level



of the floor, all the radiating-surface is utilized, and the waters of condensation, instead of backing up against the steam, are continually forced forward by the steam and back into the boiler. In the systems now in use the steam has had to overcome the power of gravity; but in my system both act to carry forward the waters of condensation, and all auxiliary devices to return these devices to the boiler are rendered unnecessary. I have not entered into any detailed description of the fire-pot, boiler, or the method of supplying fuel or water to the same, as they are not of the essence of my invention, and I am moreover enabled to use any ordinary fire-pot or boiler in connection with my improvement with equal facility.

If desired, the pipes within the car may be brought around underneath the seats, or formed into any desirable shape suitable for radiating purposes, care being taken, however, to preserve the declinations, as hereinbefore set forth, in order that no condensed water shall remain in the pipes.

Having thus described my invention, what I

claim as new, and desire to secure by Letters Patent, is—

1. In a car-heating apparatus, steam-pipes leading from the boiler upward between the floors, thence to the sides and into the car directly to the highest point in the circulatory system, from whence the pipes pass toward the ends of the car at a declination, and, returning, pass at a declination toward the starting-point and downward into the boiler.

2. In a car-heater, the combination, with a boiler and a pipe leading upward into the car, at the side thereof, of a pipe extending the length of the car, and a return-pipe leading to the boiler, both of said pipes maintaining a constant declination from the central pipe, whereby the waters of condensation are continually returned to the boiler, no stoppage being possible in the pipes.

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

NICHOLAS SLINGLAND.

Witnesses:

S. S. WILLIAMSON,  
WM. H. KELSEY.