

No. 749,970.

PATENTED JAN. 19, 1904.

N. NILSON.
STEAM HEATING SYSTEM FOR RAILWAY CARS.

APPLICATION FILED OCT. 5, 1897.

NO MODEL.

2 SHEETS—SHEET 1.

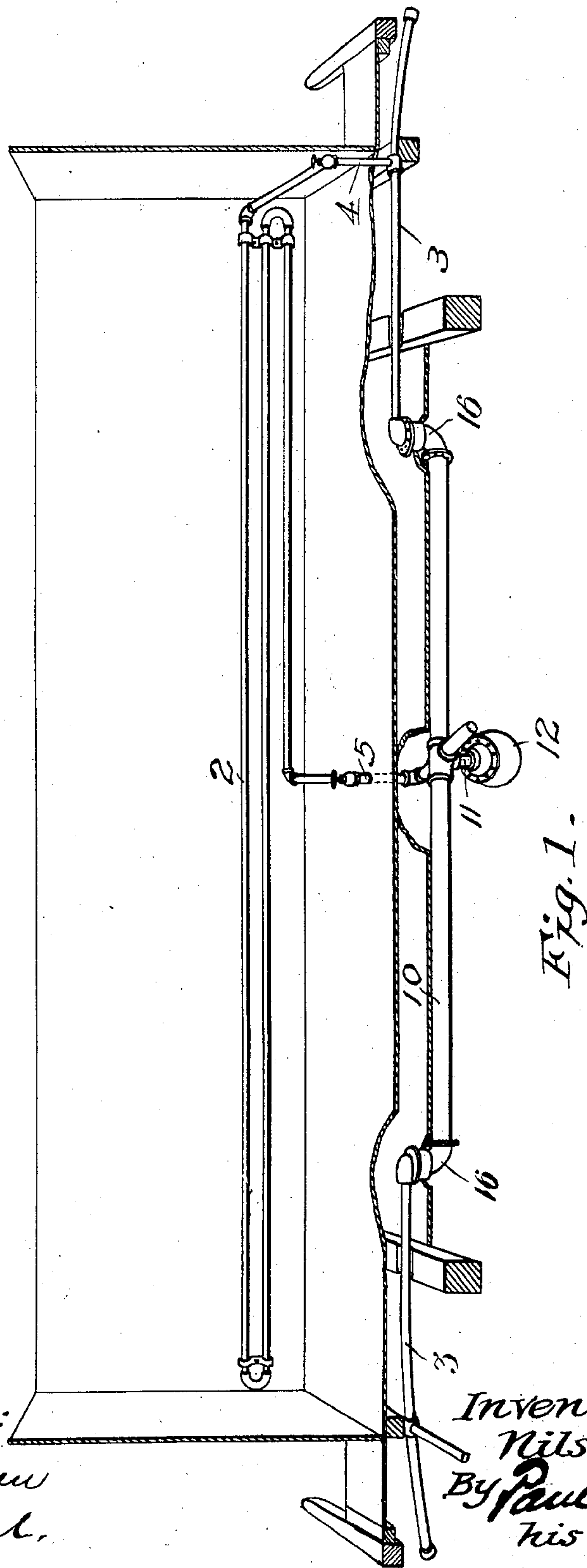


Fig. 1.

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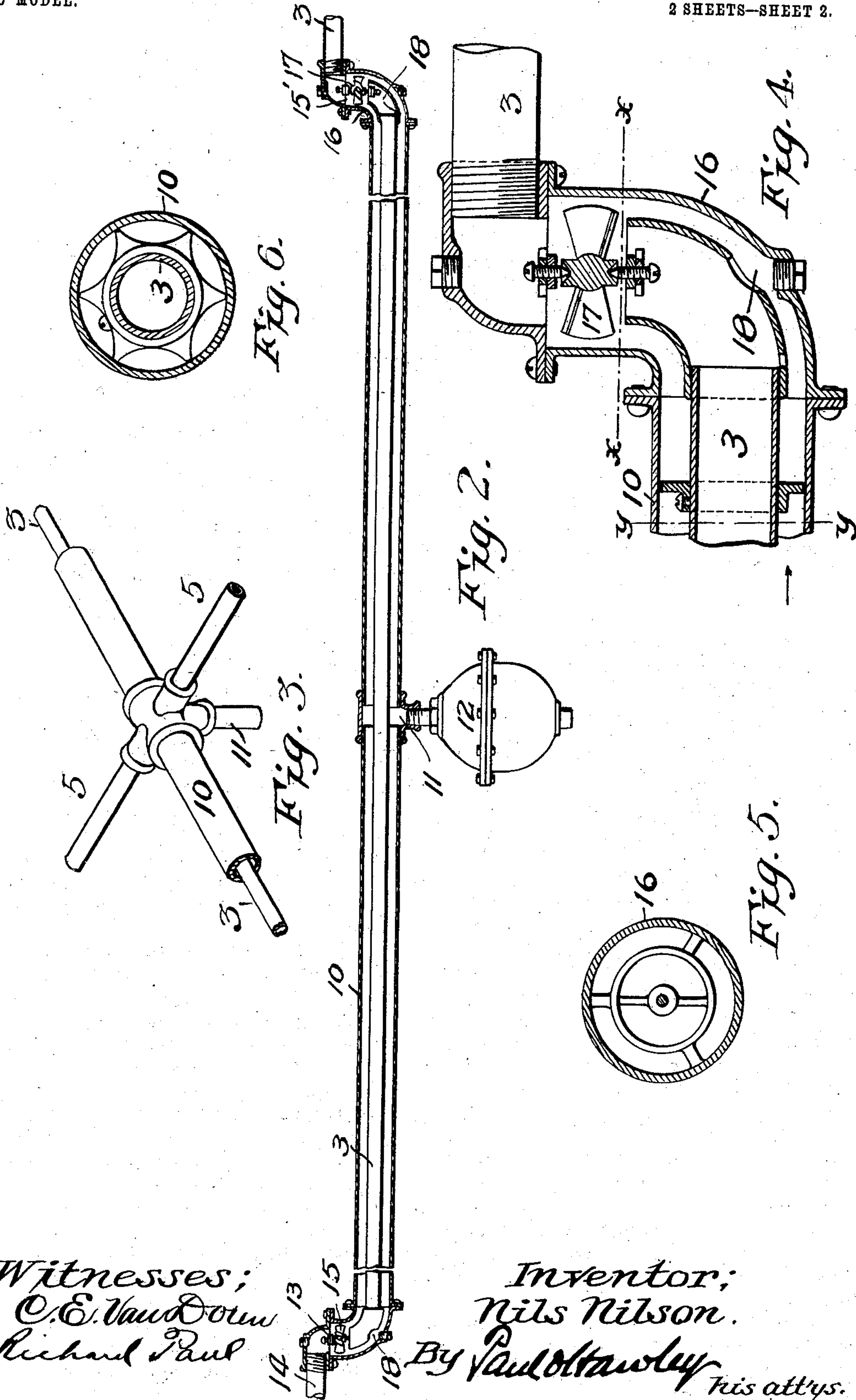
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UNITED STATES PATENT OFFICE.

NILS NILSON, OF MINNEAPOLIS, MINNESOTA.

STEAM-HEATING SYSTEM FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 749,970, dated January 19, 1904.

Application filed October 5, 1897. Serial No. 654,120. (No model.)

To all whom it may concern:

Be it known that I, NILS NILSON, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Steam-Heating Systems for Railway-Cars, of which the following is a specification.

This invention relates to the heating of railway-cars, and particularly to means whereby the steam-passages are at all times kept open, and, further, means whereby the heat is conserved.

When a train is made up, the train-pipes of the different coaches are connected by suitable hose-couplings and steam is turned on at one end of the system. Entering with considerable pressure, the steam drives back the water which stands in the pipes until the rear part of the system is quite filled with water or until a column of water is interposed between the steam and the body of air confined in the other parts of the heating system. The presence of water and air, therefore, make it necessary to employ steam at a high pressure in order to displace the water and air and allow the entrance of the steam to all parts of the system. So high a pressure is sometimes used as to burst the couplings or connections and cause considerable delay and damage.

The object of this invention is to provide means in connection with the train-pipe or service-pipe of each coach whereby the water of condensation will be quickly disposed of as soon as steam at even a low pressure is turned into the pipes.

The further object of the invention is to materially conserve the heat of the system by employing the condensation and a part of the steam to maintain the temperature of the main body of steam in the pipes beneath each coach, whereby steam may be sent to the rear of the train.

The invention consists in various constructions and in combinations of parts, all as hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a diagrammatic view showing the larger insulating-pipe. Fig. 2 is a longitudinal section through the train-pipe insulator shown in Fig. 1. Fig. 3 is a perspective view showing the union of the insulator-pipe, the return-pipe, and the trap connection. Fig. 4 is an enlarged view showing the separator. Fig. 5 is a sectional view substantially on the line xx of Fig. 4. Fig. 6 is a sectional view substantially on the line yy of Fig. 4.

In the drawings, 2 represents a suitable radiator, and 3 the train-pipe, which extends from end to end of the coach, one section of the train-pipe being arranged beneath each coach and the several sections being joined by flexible-rubber couplings between the cars similar to those used in the air-brake systems. The steam is taken from the train-pipe to the radiators through a pipe 4 and leaves the radiator through a return-pipe 5, which pipe is connected to the two radiators on opposite sides of the car. At any desired point in the train-pipe I arrange a steam-separator 7 and in connection therewith a trap 8. The steam loses a large part of its original temperature in passing through the length of the train, and the proportion of condensation increases with the distance from the engine. To minimize this condensation and the loss of heat, I prefer to incase the greater part of the train-pipe beneath each coach in a pipe 10 of substantially twice the diameter of the train-pipe. At the middle or other convenient point in this pipe 10 I provide a discharge-opening 11 and a suitable steam-trap 12. The ends of the train-pipe 3 are open within this insulator-pipe. At each end of the train-pipe I preferably provide a separator 15, so that regardless of the direction of the steam condensation will be removed therefrom and directed not into the smaller pipe 3, but into the larger pipe 10,

wherein it flows directly to the steam-trap, while the dry steam takes the easier path through the smaller pipe 3.

The arrangement of the small pipe within the larger one is plainly shown in Figs. 2 and 4. As there shown, I prefer to arrange the ends of the pipes in the form of an upward-turning elbow, to which elbow the smaller service-pipe 14 is connected. In the space 15' in the elbow 16 I provide the whirling fan-like separator 17 of substantially the construction shown and described in my pending application executed and filed of even date herewith. This whirling winged wheel is operated by the steam, and its inclined blades catch and divert all of the water entering the two pipes through the service-pipe 14 and throw the same against the walls of the large elbow, from whence it flows into the lower part of the large pipe 10. As some water will probably drop into the upturned elbow on the end of the smaller pipe, I preferably provide a drain-hole 18 in the under side of said small elbow. This hole, furthermore, makes it possible to insert the tool which is used in finishing the integral and internal parts of the double-elbow construction. As one of the separators is arranged at each end of the two pipes, obviously the car may be turned end for end without affecting the operation of the system. Furthermore, the separator, which is at the rear end of the car, will act to take up the water of condensation which has collected during the passage of the steam through the two pipes, and said water will be taken care of in the large pipe and the trap connected therewith, as explained above. The return-pipes of the radiators in the railway-car are connected into the sides of the large pipe 10, as shown

in Fig. 3, while the live-steam connections to the radiators are made direct with the service-pipe 14 or with the small interior pipe 3.

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

1. The combination, with the train-pipe, of the downwardly-extending elbows, the insulator-pipe arranged between said elbows, the continuation of the train-pipe provided within said insulator-pipe and having its ends open within said downwardly-extending elbows, a steam-separator provided in each of said elbows, and a steam-trap depending from said pipe 10, substantially as described.

2. The combination, with the pipe 10, of the elbow 16, the train-pipe connected to said elbow 16, the pipe within said pipe 10 and having the upwardly-extending elbow within the elbow 16, the revoluble steam-separator provided in said elbow 16 above the smaller elbow within the same, and a suitable drain from said pipe 10, as and for the purpose specified.

3. The combination, with the insulating-pipe 10 having the opening 11 and the steam-trap 12, of the elbow 16 provided on the end of said pipe 10, the train-pipe 3 provided within said pipe 10 and having an elbow within said elbow 16, a revoluble steam-separator provided in said elbow 16 above said train-pipe elbow and a drain-hole 18 provided in said train-pipe elbow beneath said separator, substantially as described.

In testimony whereof I have hereunto set my hand this 20th day of September, A. D. 1897.

NILS NILSON.

In presence of—

C. G. HAWLEY,
RICHARD PAUL.