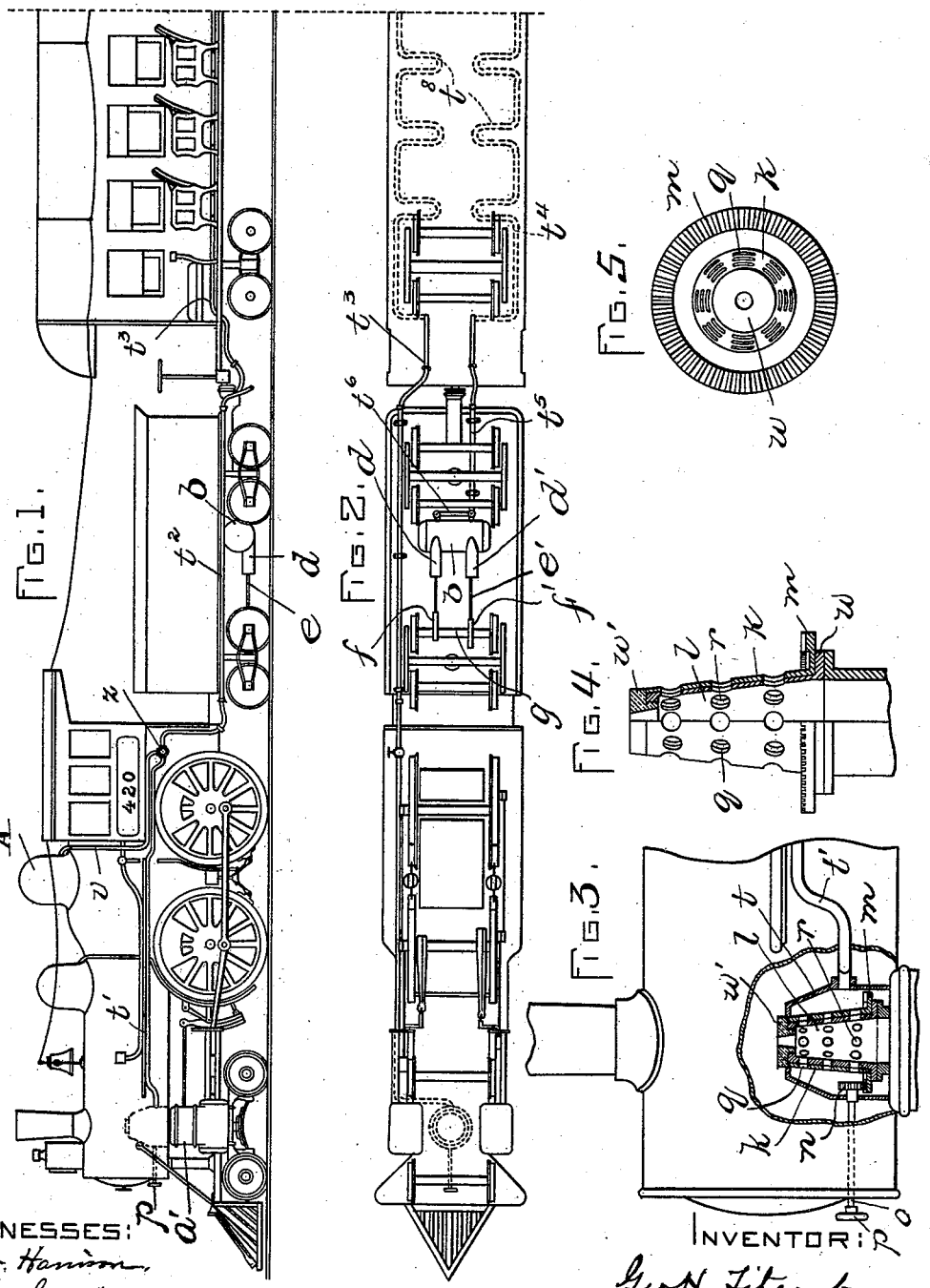
(No Model.) 2 Sheets—Sheet 1.

G. H. TITCOMB.

STEAM HEATING SYSTEM FOR RAILWAY TRAINS.

No. 522,681. Patented July 10, 1894.



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(No Model.) 2 Sheets—Sheet 2.

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FIG. 6.

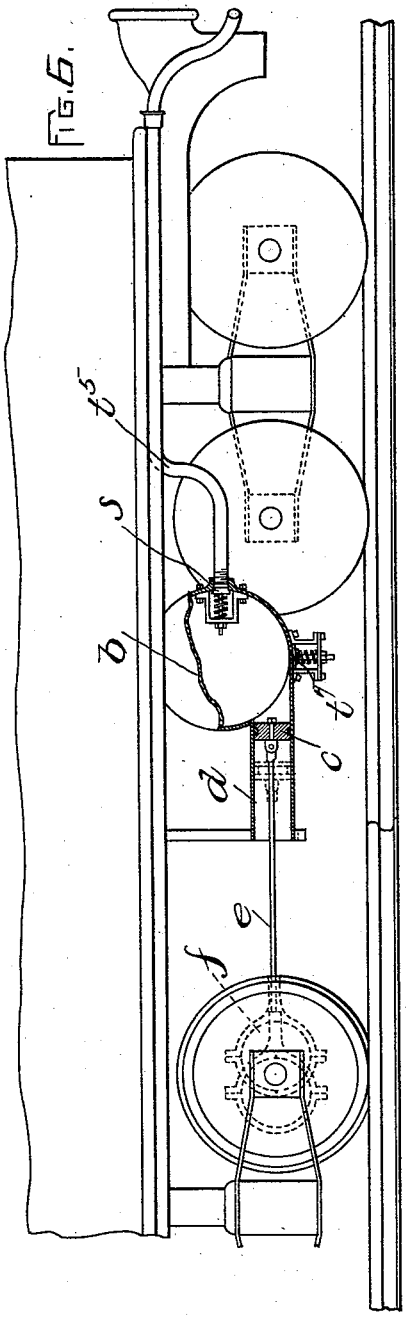


FIG. 7.

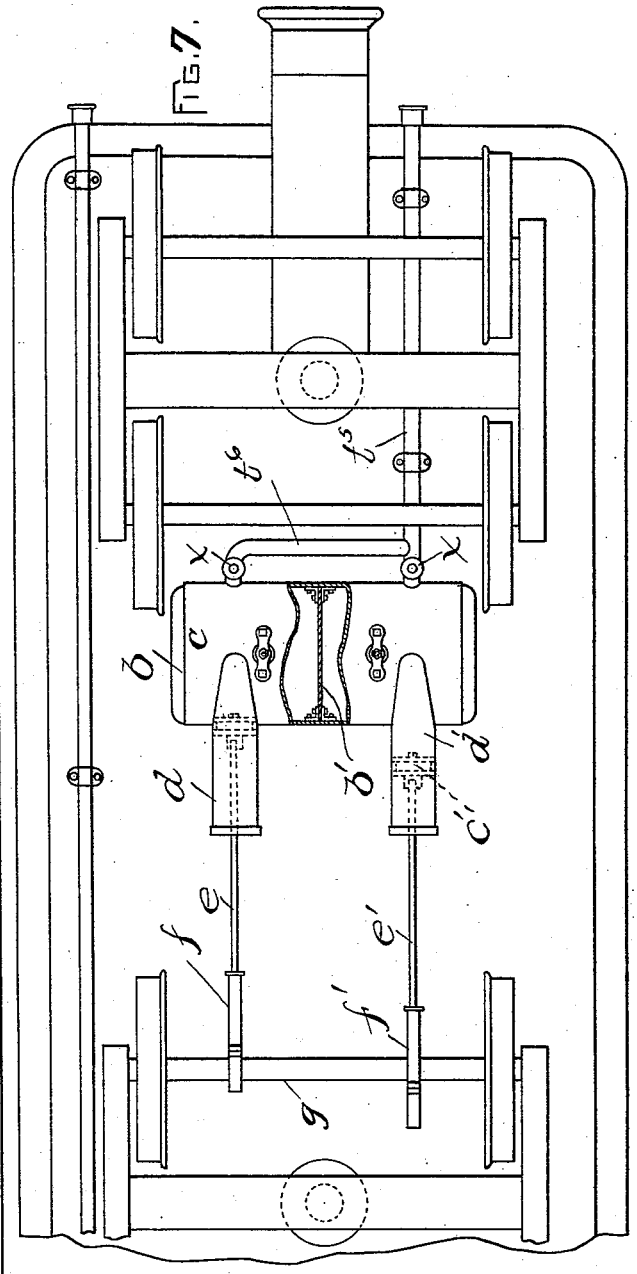
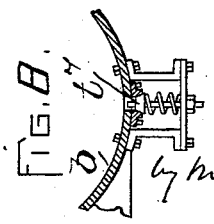


FIG. 8.



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UNITED STATES PATENT OFFICE.

GEORGE H. TITCOMB, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE UNITED STATES STANDARD HEATING COMPANY, OF SAME PLACE.

STEAM-HEATING SYSTEM FOR RAILWAY-TRAINS.

SPECIFICATION forming part of Letters Patent No. 522,681, dated July 10, 1894.

Application filed January 9, 1893. Renewed December 7, 1893. Serial No. 492,990. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. TITCOMB, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Steam-Heating Systems for Railway-Trains, of which the following is a specification.

This invention relates to an improvement in steam-heating systems for railway cars in which the exhaust from the locomotive is utilized.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a locomotive, tender, and part of a car, coupled together. Fig. 2 shows a bottom view of the locomotive, tender, and part of a car,—the exhaust-nozzle in the smoke-arch of the locomotive, and the circulating pipes in the car being indicated by broken lines. Fig. 3 shows an elevation on an enlarged scale of a portion of the locomotive, represented as broken away to disclose the exhaust-nozzle, which appears in section. Fig. 4 shows an enlarged detail of the exhaust-nozzle, one half being in section. Fig. 5 shows a top or plan view of said exhaust-nozzle. Fig. 6 shows an enlarged side-elevation of the tender with the receiver-tank beneath the same and one of the pumps communicating therewith appearing in section. Fig. 7 shows a bottom view of the tender,—the said receiver-tank being broken away at the middle. Fig. 8 shows a sectional detail, illustrating a discharge-valve.

The letter l designates a conical exhaust-nozzle which stands in the smoke-arch of the locomotive over the exhaust from the steam-chests a'. This nozzle is open through to permit the passage of the exhaust steam to the stack as usual, and is provided with orifices r in its sides.

A rotatable damper k fits over the conical nozzle and has orifices q, arranged to register with those in the nozzle, and the said damper is confined between a shoulder w at the base of the nozzle and a cap-nut w', screwing into the top of said nozzle.

A crown-wheel m is formed at the base of the damper and surrounds the same, and a spur wheel n gears into the said crown-wheel and is carried on a rod o which projects out of the front of the locomotive and there has a hand-wheel p for turning it to close the orifices in the nozzle l by the rotation of the damper k, and thereby cut off the exhaust steam from the heating pipes. It is obvious that other means may be employed to accomplish this result and instead of being controlled from the front of the locomotive as here shown, the damper could be controlled from the cab of the locomotive.

A jacket t surrounds the nozzle on all sides and forms an annular chamber about the said nozzle.

A supply pipe t' extends from the jacket t along the side of the locomotive and connects by a flexible coupling with a similar supply-pipe t^2 on the tender, which is in turn connected by a flexible coupling with a pipe t^3, on the car. Similar piping extends to the rear end of the train and thence returns to the tender.

The return pipes which appear on the drawings are designated t^4 t^5, and the latter leads into a horizontal receiving tank b suitably supported under the tender. This receiving tank is divided into two compartments by a central partition b', and the pipe t^5 leads into one of these compartments while a branch t^6 of said pipe t^5 leads into the other of said compartments, suitable cocks x being provided in both the main and the branch pipe so that either of said compartments may be cut out as desired.

Horizontal pump-cylinders d d' communicate respectively with the compartments of the receiving tank, and pistons c c' in said pump-cylinders connect by rods e e', with eccentrics f f' on an axle g of one of the tender-trucks. Inlet check-valves s are arranged within the receiver where the pipes t^5 t^6 enter, and outlet check-valves t^7 control ports in the bottom of the said receiver.

The operation is as follows: While the train is running, the pumps d d' draw the steam through the piping t^5 t^4 t^3 t^2 t' from the annular chamber inclosed by the jacket t which chamber is supplied from the exhaust of the locomotive through the orifices in the nozzle l and damper k, and the said pumps discharge the steam and the water of condensation through the outlet valves t^7 in the bottom of

the receiver. Thus a constant circulation of exhaust steam is kept up through the pipes and the cars are thereby heated.

The piping in the cars extends along each side thereof and return-bends t^8, are or may be made in such piping so as to carry the circulation over the car-floor and thereby effectually accomplish the heating.

The advantage of the double arrangement of pumps is that should one become inoperative by reason of a leak or from other cause, it may be cut out by turning one of the cocks x, and the other one will still perform the duty of maintaining the circulation through the pipes.

A pipe v see Fig. 1 leads from the steam-dome A of the locomotive-boiler, to the supply-pipe t' and where it joins the same, a three-way cock z is inserted. When the train is at a stand-still this cock may be turned to admit live steam from the dome into the circulating pipes, such live steam by reason of its high pressure making its way through the pipes without the aid of the pumps which of course are inactive as long as the train is standing.

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

1. In a steam heating system for railway cars, the combination of suitable piping taking steam from the locomotive and extending through the train, a receiver having two compartments separately communicating with such piping, and a pump for each compartment of the receiver and connected with a rotary part of the running gear of the train for the purpose described.

2. In a steam heating system for railway cars, the combination of a nozzle communicating with the locomotive exhaust and having a lateral orifice, a rotatable damper fitting on said nozzle and having an orifice to register with that in the nozzle, means for rotating said damper, a chamber around said nozzle, piping communicating with said chamber and extending through the train, and a pump to exhaust from said piping substantially as described.

3. In a steam heating system for railway cars, the combination of a nozzle communicating with the locomotive exhaust and having a lateral orifice, a rotatable damper fitting on said nozzle and having an orifice to register with that in the nozzle, and also provided with a crown-wheel, a spur-wheel engaging said crown-wheel and having a handle by which to turn it, a chamber around the nozzle, a piping communicating with said chamber and extending through the train, and a pump to exhaust from said piping substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of January, A. D. 1893.

GEORGE H. TITCOMB.

Witnesses:
C. F. BROWN,
A. D. HARRISON.