No. 834,944. PATENTED NOV. 6, 1906.

S. G. STEVENS.

MEANS FOR WARMING MATERIAL WHILE IN TRANSIT.

APPLICATION FILED DEC. 12, 1905.

FIG. 1.

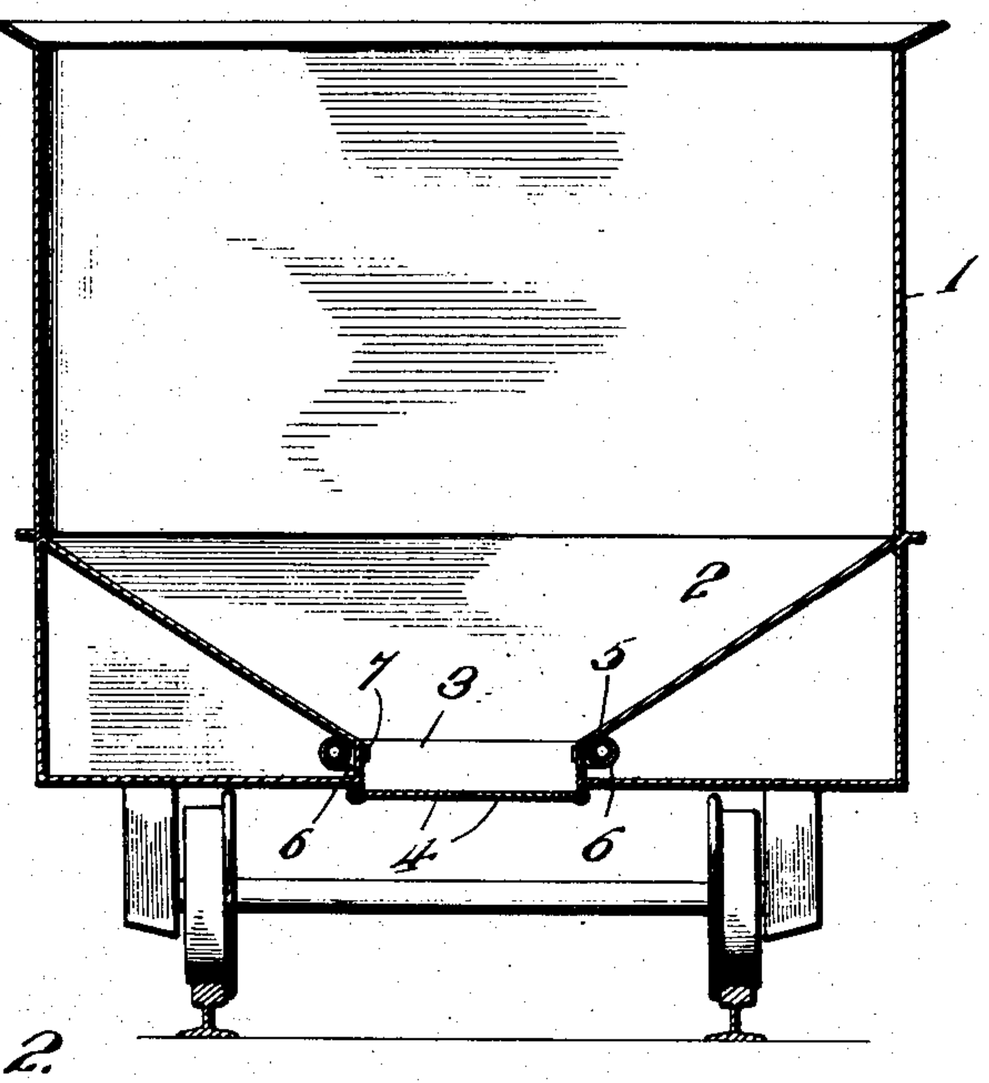


FIG. 2.

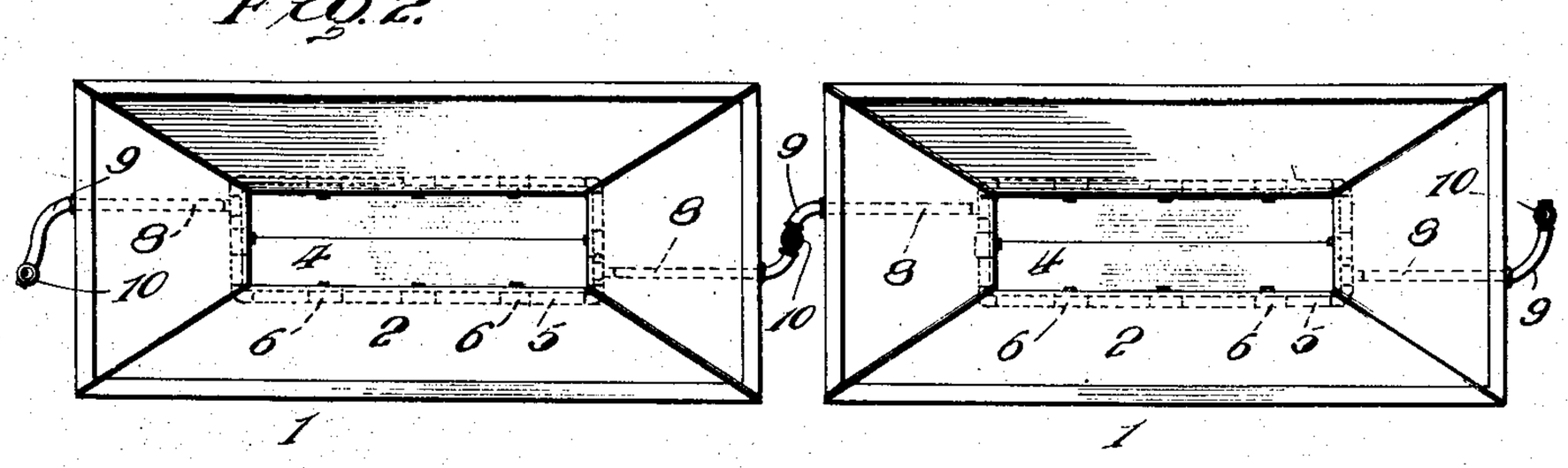
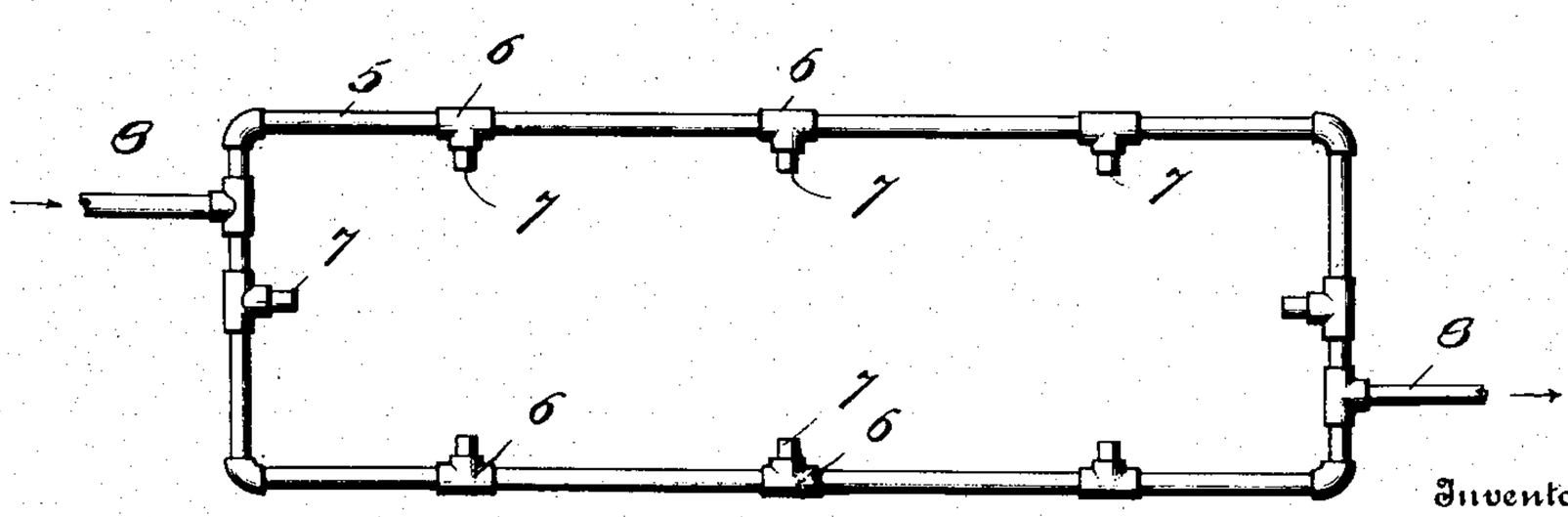


FIG. 3.



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MEANS FOR WARMING MATERIAL WHILE IN TRANSIT.

No. 834,944. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed December 12, 1905. Serial No. 291,444.

To all whom it may concern:

Be it known that I, SYLVESTER GEORGE STEVENS, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Means for Warming Granular Material While in Transit, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in means for warming granular material while in transit.

The object of my invention is to provide means for heating material while in transit, and is more especially applied to ore-cars for the heating of the ore and preventing the same from freezing, and thus allowing of the ready dumping of the ore from the car when the destination of the car is reached. This prevents the necessity of thawing out the ore after the car is stopped, thus delaying the dumping of the cars.

Another object of my present invention is to so construct a means whereby the heating means may be either connected to the boiler or may be connected to the exhaust of the engine, and when the latter is used it will be seen that a saving in fuel is accomplished.

In the accompanying drawings, Figure 1 is a transverse vertical sectional view of a hopper-car commonly used in the transportation of granular material and showing my invention applied thereto. Fig. 2 is a top plan view of two cars similar to that shown in Fig. 1, showing the relative position of the invention and also the coupling of the steam-pipes between the same. Fig. 3 is an enlarged top plan view of the heating-pipes removed.

Referring now to the drawings, 1 represents the ordinary car having the hopper bottom 2 therein and provided at its lower end with the usual vertical neck portion 3 and said neck portion provided at its lower end with the sliding gates 4, which is fully understood and needs no further description.

The bottom 4 of the car surrounding the neck 3 is provided with a steam-pipe 5, which is provided with any desired number of inwardly laterally extending connections 6, which may be placed any desired distance apart, according to the number of connections used. The said connections, as shown and described, extend inwardly through the neck 3 of the hopper and have their free ends 7 in communication with the hopper, as will be hereinafter more fully described. The said connections, as shown, not only extend inward and communicate with the neck of the hopper at the sides, but also at the ends. The said pipe 5 has connected thereto the pipes 8 at each end and which have connected thereto the flexible pipes 9, which carry the couplings 10, by means of which the flexible pipes are connected for coupling the steam-pipes together for connecting the several cars composing the train up with the heating system.

From the foregoing description it will be seen that when the hoppers of the numerous cars are filled with ore and the train started on its journey the flexible pipe 9 of the front car is connected to a pipe carried by the tender of the engine, and said pipes are either connected to the boiler or to the exhaust of the engine, the latter being preferable, as it saves steam and necessarily fuel. The steam, as will be clearly seen, passes into the pipes 5 and through the connections 6 and out through the open ends 7 directly to the ore or granular material in the hopper, and thus prevents the same from freezing. The steam simultaneously passes into the entire train of cars and has the same effect thereon. Thus when the train has reached its destination the material therein can be readily dumped from the cars.

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

1. A car for carrying granular material, comprising a line of heating-pipes carried by said car opening into the lowermost interior carrying-space, by means of one or more relatively short pipe connections.

2. A car having a conically-shaped carrying body, a heating-pipe surrounding the lowermost portion of the body and communicating therewith by means of pipe connections.

3. A car having a conically-shaped carrying-space, a line of heating-pipes located outside and adjacent to said carrying-space, said pipe communicating with the lowermost portion of said carrying-space and also with the steam-supply of the locomotive.

4. A car for carrying granular material, comprising a hopper-shaped body having a relatively short vertical neck, said neck portion being surrounded with heating means.

5. The combination with a hopper-bottom car, of steam-supply pipes surrounding the

hopper, and branch pipes in communication with the steam-supply pipes and having their opposite ends in communication with the hopper.

6. The combination with a hopper-bottom car, of steam-supply pipes adjacent the hopper and branch pipes in communication with the steam-supply pipes, and having their opposite ends in direct communication with the lowermost portion of the interior of the hopper.

7. The combination with a hopper-bottom car, of steam-supply pipes carried by the car and surrounding the hopper, and branch pipes in communication with the steam-supply pipes and extending through the sides of the hopper and in direct communication with the interior of the hopper.

8. The combination with a car, having a hopper bottom and a relatively short vertical neck, of steam-supply pipes carried by the car and surrounding the neck, and branch pipes in communication with the steam-supply pipes, and extending through the sides of the neck and having open ends in direct communication with the interior of the hopper.

9. The combination with a hopper-bottom car, of a steam-supply pipe carried by the car and surrounding the hopper, branch pipes in communication with the steam-supply pipe and flexible pipes connected to the pipes surrounding the hopper and having couplings carried by their outer ends whereby the pipes are connected to supply-pipes from the engine.

10. The combination with a hopper-bottom car having a relatively short vertical neck, of steam-supply pipes carried by the car and surrounding the neck of the hopper, and branch pipes in communication with the steam-supply pipe and extending through the neck of the hopper, and in direct communication with the interior of the hopper.

11. The combination with a box-like car having a hopper bottom forming an air-space surrounding the said hopper bottom, of a steam-supply pipe carried by the car within the air-space, and surrounding the hopper, branch pipes in communication with the steam-supply pipe and in communication with the interior of the hopper.

12. The combination with a hopper-bottom car having a neck at its lower end, of a steam-supply pipe carried by the car and surrounding the hopper, branch pipes in communication with the steam-supply pipes and extending through the neck and in communication with the interior of the hopper, and flexible pipes connected to the pipes surrounding the hopper and having couplings carried by their outer ends whereby the pipes are connected to the supply-pipes from the engine.

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

SYLVESTER GEO. STEVENS.

Witnesses:
DONALD MCLENNAN,
MICHAEL F. CHALK.