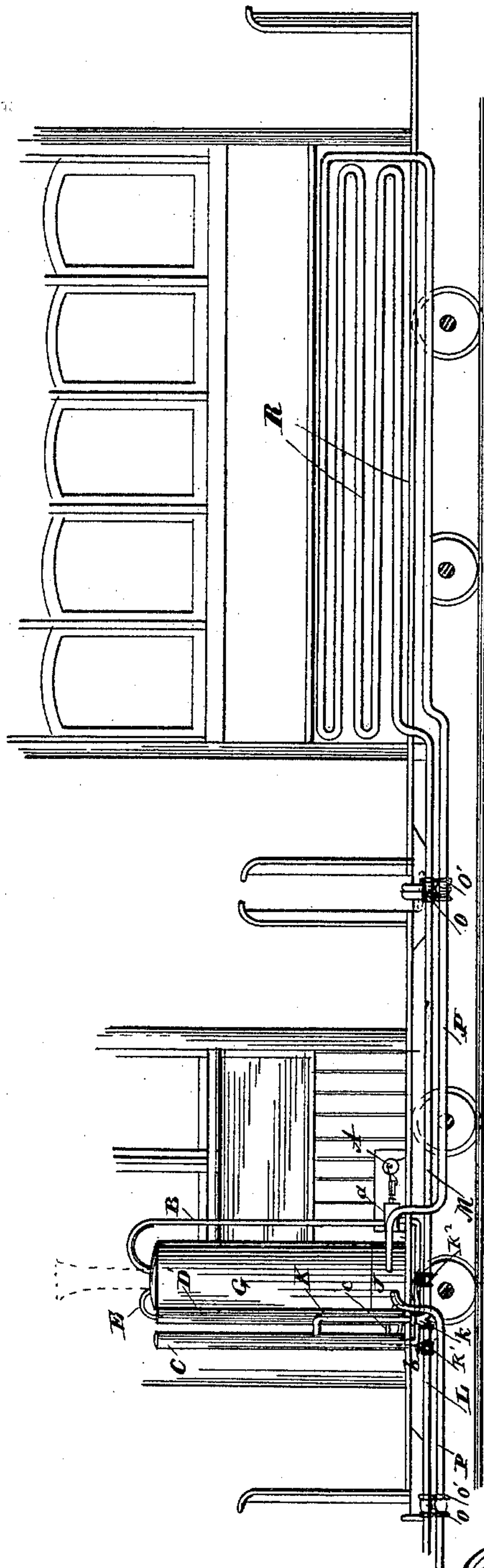


(No Model.)

2 Sheets—Sheet 1.

C. E. HEALY.
COMBINED STEAM MUFFLER AND HEATING APPARATUS.
No. 491,482. Patented Feb. 7, 1893.

Fig. 1



Witnesses
W. M. Monroe
J. H. Moore

Inventor
Caleb E. Healy
by W. M. Monroe
Attorney

(No Model.)

2 Sheets—Sheet 2.

C. E. HEALY.

COMBINED STEAM MUFFLER AND HEATING APPARATUS.

No. 491,482.

Patented Feb. 7, 1893.

Fig. 2.

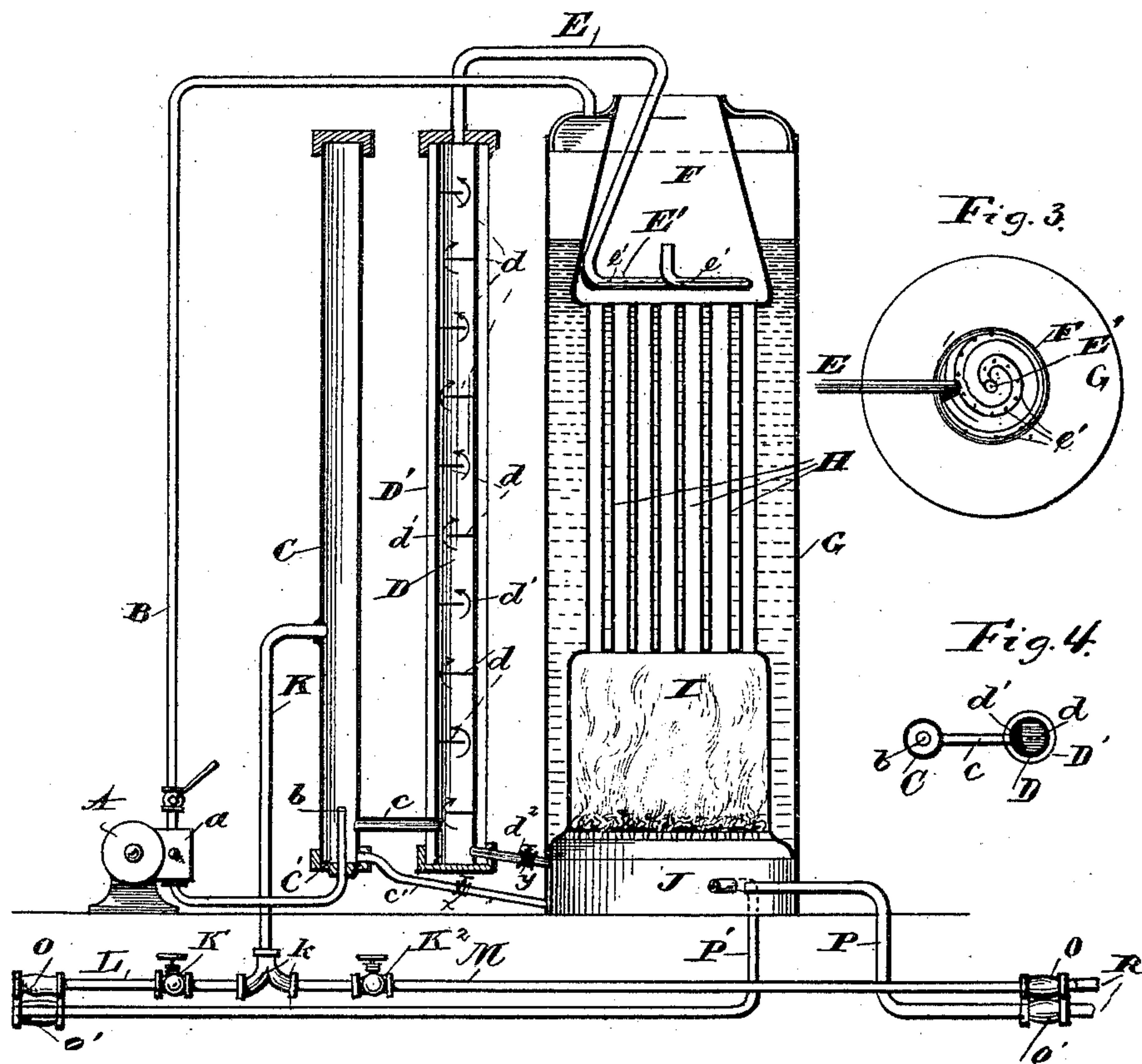


Fig. 3.

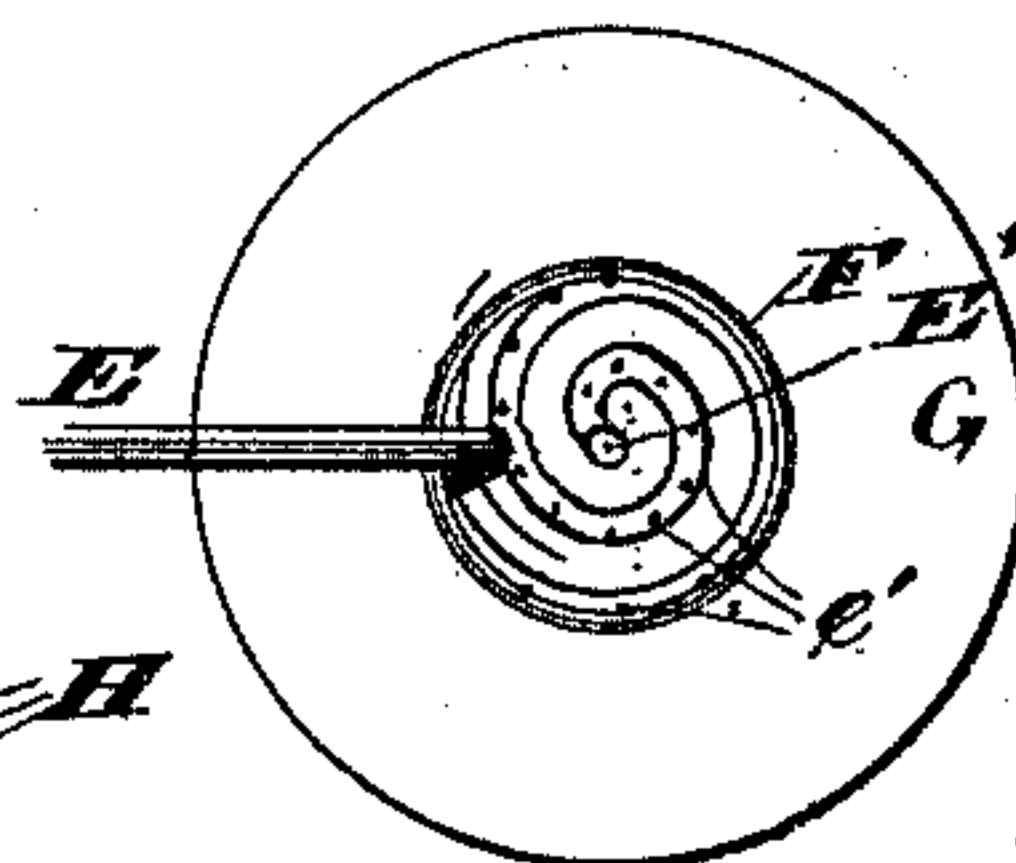
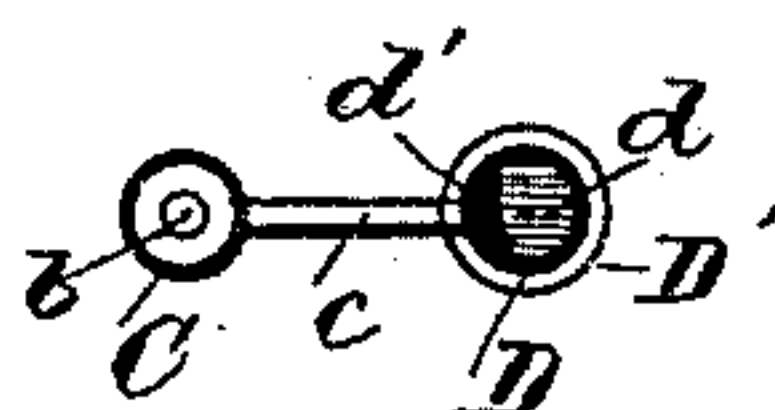


Fig. 4.



Witnesses
Wm M. Monroe
H. H. Moore

Inventor
Caleb E. Healy
By Wm M. Monroe
Attorney

UNITED STATES PATENT OFFICE.

CALEB E. HEALY, OF DETROIT, MICHIGAN.

COMBINED STEAM-MUFFLER AND HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 491,482, dated February 7, 1893.

Application filed June 20, 1892. Serial No. 437,263. (No model.)

To all whom it may concern:

Be it known that I, CALEB E. HEALY, a citizen of the United States, and a resident of Detroit, county of Wayne, State of Michigan, have invented certain new and useful Improvements in a Combined Steam-Muffler and Heating Apparatus, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in combined steam mufflers and heating apparatus for railway service, and is designed as an improvement upon the invention described in Letters Patent granted to me upon steam mufflers, dated March 31, 1891, in which apparatus for absorbing exhaust steam, is shown in combination with a high pressure engine, and bearing the number 449,120.

This invention relates to further utilization of the exhaust to heating trail cars, and consists in the combination and arrangement of parts and construction of details as hereinafter described, shown in the drawings and more specifically pointed out in the claims.

In the drawings Figure 1 is a sectional view of a motor and trail car, showing the arrangement of heating pipes and their connections with the steam drum. Fig. 2 is an enlarged view of connections, in vertical section. Figs. 3 and 4 are details.

A in the drawings represents the engine. B, the steam pipe; C, the steam condensing drum; D, the final drum for rarefied steam inclosed in the jacket D'; E, the exhaust pipe leading into the space above the submerged tubes; E', the coil perforated at e' for distributing the steam over the flue openings.

F is the funnel shaped space for concentrating the vapors above the flues.

G is the high pressure boiler.

H, is the flues.

I is the fire box and J is the ash-pit.

In small letters a is the steam chest of the engine.

b is the extremity of the exhaust pipe elevated above the bottom of the drum C.

c is a tube connecting the two drums.

c' is the drip tube discharging the condensed steam from the bottom of the drum C at C'

into the ash-pan J; d^2 is a similar tube connecting the drum D and ashpit J.

x is a stop valve in the tube c' and y , the valve in the tube d^2 .

$d, d,$ are semi-partitions arranged at intervals in the tube D to complete the discharge of the moisture from the steam and d' are the perforations through the said partitions arranged upon alternate sides of the tube D to give a zig-zag course to the ascending steam and insure its impact against each successive partition.

K, is a tube leading from the drum C at a suitable height to receive pure dry steam. This tube is branched at k and each branch as L, M, is provided with a cutoff valve as K', K². The Y thus formed is extended in two branches to either end of the motor car, where the extremities are provided with steam pipe couplings O.

It will be seen in the figures that the motor is designed to run in either direction and that a steam heating pipe R is laid in coils under the seats of the trail cars, the extremities of the pipe in the cars being left open in the direction of the engine. One of these extremities will be seen to be coupled directly to the open end of the exhaust pipe on the adjacent end of the engine, the other extremity of the heating pipe being coupled to the pipe P which is placed in the motor and discharges into the ash-pit J, and provided with couplings O'. It will therefore be seen that a constant current of heated vapor will be forced continually from the exhaust drum of the engine throughout the trail car and returned in a more or less condensed form into the ash pit, where it will not create an offensive dripping as in the well known forms now in use where the exhaust for heating purposes is delivered underneath the car in which it is used and condenses in a constantly dropping stream of water, which for city or suburban lines would be unsightly in the extreme.

The style of motor shown being adapted to move in either direction it is essential that the couplings for the exhaust pipe should be duplicated at either end and upon a change in the direction of travel the trail car or cars are attached at the other end of the motor and the other branch of the Y in the pipe is cou-

pled to the heating pipe. A second section of pipe P', connecting the outlet end of the heating pipe with the ash pit J. When in use the valve in the open branch is closed the other remaining open.

The advantages of the device appear in its neatness, simplicity and slight initial cost, as well as efficiency in use.

If desired for the use of several trail cars in succession, the pipes can be connected in each car with the next by means of pliable couplings, the final outlet being in the ash-pit as before described.

I do not claim any special arrangement of the heating tubes in the car or form of couplings but

What I claim as new and desire to secure by Letters Patent is:

1. In combination with the drum or drums of a steam muffling device, substantially as described, an exhaust pipe leading from one of the drums and terminating in two branches provided with cut off valves, substantially as described.

2. In combination with a high pressure boiler, engine and steam muffler for exhaust, substantially as described, an exhaust pipe leading from one of the muffler drums at a distance from the bottom, and terminating in two branches provided with stop valves, and outlet sections of pipe, projecting within the boiler ash-pit, substantially as and for the purpose set forth.

3. In combination with a boiler, engine and steam exhaust muffler, provided with vertical condensing drums, substantially as described, an auxiliary heating pipe leading from one of the drums at a distance from the bottom of the drums, branches leading from the pipe in opposite directions, provided with stop valves, and couplings at their open extremities, and open sections of pipe having their inner ends

inserted in the ash pit of the boiler, and outer ends provided with pipe couplings, substantially as described.

4. In combination with an engine, boiler, and exhaust steam muffler drums, located upon a motor car, an auxiliary exhaust pipe leading from one of the drums at a point above the drip outlet, branches provided with stop valves leading from said pipe to either end of the motor car and provided with couplings. Open sections of pipe leading from either end of the motor car to their terminals in the ash-pit under the boiler, and a system of steam heating pipes, adapted to connect one of said branches with one of said terminal sections, the valve in the branch pipe completing a continuous heating device, being opened, and the valve in the open branch being closed, substantially as and for the purpose set forth.

5. In a steam car motor, a steam muffler for the exhaust consisting in vertical drums into which the exhaust steam is discharged from below in successive series, the last drum of the series being provided with partial partitions, having alternating openings, drip pipes from the drums having outlets in the ashpit of the steam boiler, a final exhaust pipe leading from the last drum of the series and disposed in a coil over the boiler tube openings, in combination with an auxiliary steam pipe leading from one of the drums and provided with one or more outlets, and a system of steam heating pipes, detachably secured to one outlet of said auxiliary pipe and to an open section of pipe discharging into the ash pit of the boiler, all as and for the purpose set forth.

CALEB E. HEALY.

Witnesses:

E. C. BOWMAN,
W. G. EADE.