No. 845,766. PATENTED MAR. 5, 1907.

A. P. DODGE.

SUPPLY SYSTEM FOR LOCOMOTIVES.

APPLICATION FILED MAY 10, 1904.

Fig. 3.

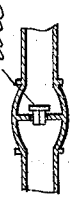


Fig. 4.

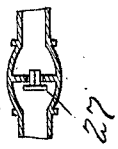


Fig. 2.

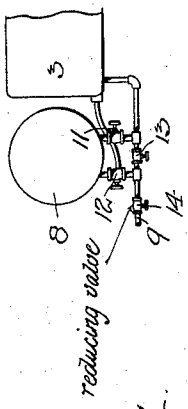
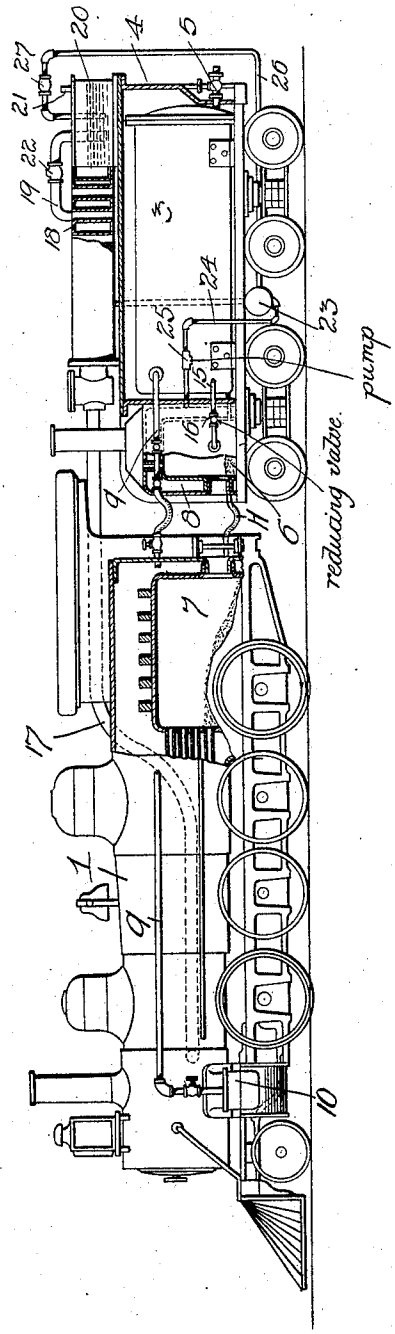


Fig. 1.



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ARTHUR PILLSBURY DODGE, OF NEW YORK, N. Y.

SUPPLY SYSTEM FOR LOCOMOTIVES.

No. 845,766. Specification of Letters Patent. Patented March 5, 1907.

Application filed May 10, 1904. Serial No. 207,208.

To all whom it may concern:

Be it known that I, ARTHUR PILLSBURY DODGE, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Supply Systems for Locomotives, of which the following is a specification.

My invention comprises a system for supplying locomotives or other engines with steam under high pressure.

My system includes in connection with the locomotive and its engine-cylinders a supplemental storage-boiler, a supplemental fire-box independent of the locomotive fire-box and surrounded by a water-chamber with pipe connections between the supplemental boiler and water-chamber, and the engine-cylinders having valves for controlling the steam-supply.

My system also includes a condenser connected with the exhaust of the cylinder, a drip-tank connected with the condenser, and a muffler tank or chamber connected by air or steam relief pipes with the condenser and drip-tank, respectively, said relief-pipes having a check valve or valves therein for preventing the inlet of air to the condenser system.

In the accompanying drawings, Figure 1 is a side view of an ordinary locomotive with my invention combined therewith, some of the parts being shown in section; and Fig. 2 is a plan view of a detail. Figs. 3 and 4 are detail views of check-valves.

In these drawings the ordinary locomotive is represented at 1 and the tender at 2. Upon the latter is carried a supplemental boiler 3, this being inclosed within suitable casings 4, and ordinary provision being made to prevent the radiation of heat from the supplemental boiler. A charging connection 5 permits the supplemental boiler to be charged with hot water and steam under high heat and pressure. A fire-box 6 is arranged upon the front end of the tender, this being independent of but adjacent to the ordinary fire-box 7 of the locomotive, so that the fireman can readily attend to both fires. Around this supplemental fire-box a water-chamber 8 is arranged. A pipe 9 extends from the supplemental boiler 3 above the water-line thereof to the steam-chest 10 of the engine-cylinders. This pipe is connected with the water-heating chamber 8 by branches having valves 11 and 12 therein, respectively, while a valve 13 is arranged upon the pipe 9 between the branches. Another valve 14 is arranged in the pipe 9 between the steam-chest 10 and the said branches. If the valves 11 and 12 are closed and the valves 13 and 14 are open, the steam will pass directly from the supplemental boiler 3 to the steam-chest 10 of the locomotive.

If the valve 13 is closed and valves 11, 12, and 14 are open, the steam will pass from the supplemental boiler 3 through the valve 11, the hot-water chamber 8, and thence by way of valves 12 and 14 and pipe 9 to the steam-chest 10. If the valves 11 and 13 are closed, steam will then pass only from the hot-water chamber 8 to the steam-chests. This latter connection is maintained when hot water is admitted to the chamber 8 from the supplemental boiler, and for this purpose a pipe 15 is provided having a pressure-reducer 16. A pipe 17 receives the exhaust-steam and conveys it to a condenser 18, and this condenser is preferably arranged above the tender of the locomotive. An air-relief pipe 19 extends from this condenser into a tank 20, and this pipe will carry off any air which is in the condensing system and any surplus steam which may not be condensed. The tank 20 acts as a muffler and is of sufficient size to prevent any show of steam. This tank is ventilated by a pipe 21.

The valves 14 and 16 are reducing-valves, because the pressure in the supplemental boiler is greater than that required in the steam-chest and the cylinders.

By this system, as above described, water may be admitted either cold or hot to the chamber 8. If hot, it may be converted into steam by its release into the chamber 8 and by the heat of fire-box 6, and if cold it may be vaporized by the heat from the supplemental fire-box 6, or steam may be admitted from the supplemental boiler 3 by way of valve 11, valve 13 being closed to the chamber 8, and from this chamber the steam passes through the pressure-reducing valve 14 to the steam-chest.

I do not limit myself to supporting the supplemental boiler or fire-box 6 upon the tender, as shown.

A pipe H connects the water-space of the supplemental boiler with that of the main boiler.

Having thus described my invention, what I claim is—

1. In combination with a locomotive-

boiler, fire-box and engine-cylinders, with the ordinary steam-supply connection thereto, a supplemental boiler with pipe connections leading direct to the engine-cylinders, said supplemental boiler and connections comprising means for supplying steam to the cylinders independent of the main boiler, substantially as described.

2. In combination with a locomotive having the ordinary cylinders and steam-supply connections, an independent detached fire-box separate from the locomotive, a water-heating chamber in connection with the said fire-box, and pipe connections from said chamber leading directly to the steam-chest of the engine-cylinder, said water-heating chamber and pipe connections forming means for supplying steam to the cylinders independent of the main boiler, substantially as described.

3. In combination with a locomotive, a supplemental boiler, a fire-box independent of the locomotive, a water-chamber to be heated by the fire-box, steam-pipe connections between the supplemental boiler and the said water-chamber and pipe connections from the water-chamber to the locomotive, the said water-chamber being thus interposed between the supplemental boiler and the locomotive, substantially as described.

4. In combination with a locomotive, a supplemental boiler, a fire-box independent of the locomotive, a water-chamber to be heated by the fire-box, water-pipe connections between the supplemental boiler and the said water-chamber, and pipe connections from the water-chamber to the locomotive, the said water-chamber being thus interposed between the supplemental boiler and the locomotive, substantially as described.

5. In combination, the steam-chest, the fire-box independent of the locomotive, the water-chamber in connection with the fire-box, a supplemental boiler, pipe connections between the supplemental boiler and the water-chamber and between the water-chamber and the steam-chest, with branch connections and valves 11, 12 and 13 whereby the steam may pass directly from the supplemental boiler to the steam-chest, or from the supplemental boiler to the water-heating chamber and thence to the steam-chest or from the water-chamber alone, substantially as described.

6. In combination, a boiler, the steam-chest, a connection from the boiler to the steam-chest, a water-chamber interposed in said connection a second connection between the boiler and the water-chamber and a pressure-reducing valve in said connection, substantially as described.

7. In combination, the steam-chest, a boiler, a water-heating chamber, a steam and a water pipe connection between the boiler and the chamber the said water-pipe having a reducing-valve therein, a pipe connecting the water-heating chamber with the steam-chest and a reducing-valve in said connection, substantially as described.

8. In combination, the main boiler, connected to the engine-cylinders, the supplemental boiler, a pipe H connecting them below the water-line and a steam-pipe leading from the supplemental boiler direct to the engine-cylinders, substantially as described.

9. In combination, the main boiler, a supplemental boiler, a pipe H connecting the main and supplemental boiler, a chamber having a steam and a water pipe connection with the supplemental boiler, a furnace for heating the chamber and a steam-pipe connecting the chamber with the engine-cylinders, substantially as described.

10. In combination, with the main boiler, a supplemental boiler, means whereby the latter may be charged with water and steam under high heat and pressure, a water-heating chamber connected with the supplemental boiler and with the engine-cylinders, and an independent fire-box for the water-heating chamber substantially as described.

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

ARTHUR PILLSBURY DODGE.

Witnesses:
P. F. W. RUTHER,
WILLIAM C. DODGE.