

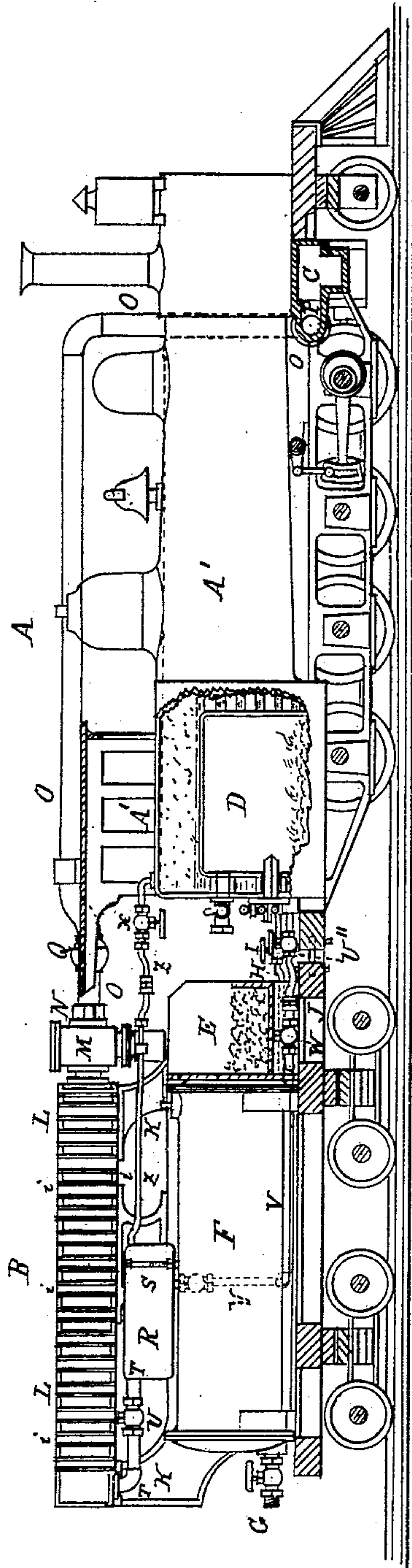
No. 713,558.

Patented Nov. 11, 1902.

A. P. DODGE.  
LOCOMOTIVE.

(Application filed Apr. 14, 1899. Renewed Oct. 11, 1901.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 713,558, dated November 11, 1902.

Application filed April 14, 1899. Renewed October 11, 1901. Serial No. 78,393. (No model.)

*To all whom it may concern:*

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

The object of my invention is to produce a motor utilizing all the valuable features of the locomotive-engine, but to avoid the use of forced draft and waste of fuel and the production or showing of smoke, sparks, or cinders by making the boiler of practically two parts, one, the main boiler or part, being connected by pipes to the supplemental boiler and adapted to receive therefrom hot water and steam instead of cold water, as heretofore, said supplemental boiler receiving its supply from suitable charging-stations.

In the accompanying drawing the figure represents an elevation of an engine with parts in section, the supplemental boiler being shown in rear of the main boiler.

A represents a locomotive of ordinary or improved construction, but having no forced draft, as in the present type of locomotive, and having no nozzling down of the exhaust-steam to create this draft, thus abolishing the noise and greatly reducing the back pressure upon the pistons while permitting a slow combustion of the fuel and economizing in fuel, and instead of the usual tender carrying coal and water I use the tender-truck to carry a supplemental boiler F and a small fuel-box E, adapted to supply the small amount of fuel required in the fire-box D to maintain the temperature of the water fed to the main boiler. The boiler F is covered heavily with a non-conducting material to prevent or check loss of heat, and the main boiler is also covered with non-conducting material. The supplemental boiler F is furnished with an inlet-valve G on its rear end for charging the same with water of a high temperature suitable for giving off steam-pressure, this water and its stored steam being supplied to the tank from a stationary steam-generator at the supply-station of the train. The forward end of the said tank or boiler is furnished with a pipe H, extending from it to the lower water-space of the boiler of the engine, and said

pipe H is furnished with a suitable stop-valve I. By opening said stop-valve I the boiler is suitably supplied with high-pressure steam and water whenever required. The sides of the truck-platform are provided with strong iron supports K, extending above the tank F, and upon the supports K is supported a horizontal steam-condenser L, with a series of vertical air-tubes extending through it. At the forward corners of said condenser are employed vertical oil-separators M, each of which has its inlet N connected by a pipe O with the locomotive exhaust-chamber C. For convenience only one separator M, with its connections, is shown, there being one, however, for each cylinder C. Said pipes O have each a flexible and universal joint Q near their junction with the separator. Below the condenser is furnished a gravity-tank R, provided with a water-gage S to show the level of water therein. The top and empty space of said gravity-tank are connected by pipe T with the rear bottom end of the condenser L for conducting the water of condensation from the condenser into the gravity-tank R. Said pipe T is furnished with a check-valve U, which closes against pressure from the gravity-tank. The bottom part of the gravity-tank R is furnished with outlet-pipe V, connecting with the water-space of the boiler of the locomotive. Said pipe V is provided with a universal joint and flexible joint, a check-valve W, and a stop-valve U". The top space of the gravity-tank is connected with steam-space of the boiler A' by a pipe Z, which is furnished with a stop-valve X. Said pipe Z is also furnished with a universal joint and flexible portion, the same as the pipe V. The exhaust of the steam-engine passes from the exhaust-chamber C by the two pipes O into the separators M. By the removal of the oil from the steam in these separators the steam loses the heat stored in the oil, and therefore condenses rapidly. The water from the condenser passes into the gravity-tank R, in which it accumulates until its water-gage S indicates the level for discharging, and this being observed by the engineer he opens the valve X. The pressure of the boiler now passes into the tank R and closes the check-valve U in the pipe T, breaking connection between tank R and the condenser L, and the



pressure also opens the check-valve W in the pipe V, causing the discharge automatically of the water from the gravity-tank into the boiler.

- 5 Another important advantage is that the supplemental boiler can be put in connection with the main boiler when going upgrade where the locomotive could not stop to connect with a stationary storage-boiler, the supplemental boiler being thus capable of use in  
10 such emergencies, and thus largely increasing the efficiency of the locomotive.

What I claim as my invention, and desire to secure by Letters Patent, is—

- 15 1. In combination with a locomotive, a two-part boiler with a connection between the parts, one of the parts being adapted to be charged with hot water and steam under high

pressure and one part having a fire-box to maintain the heat and pressure, substantially as described. 20

2. In a locomotive, the combination of a two-part boiler with pipe connections between the parts, one of the parts being adapted to be charged with hot water and steam under  
25 high pressure and one part having a fire-box to maintain heat and pressure, a condenser connected with the locomotive-exhaust and an oil-separator, substantially as described.

In testimony whereof I affix my signature 30 in presence of two witnesses.

ARTHUR PILLSBURY DODGE.

Witnesses:

REINHOLD BOEKLEN,  
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