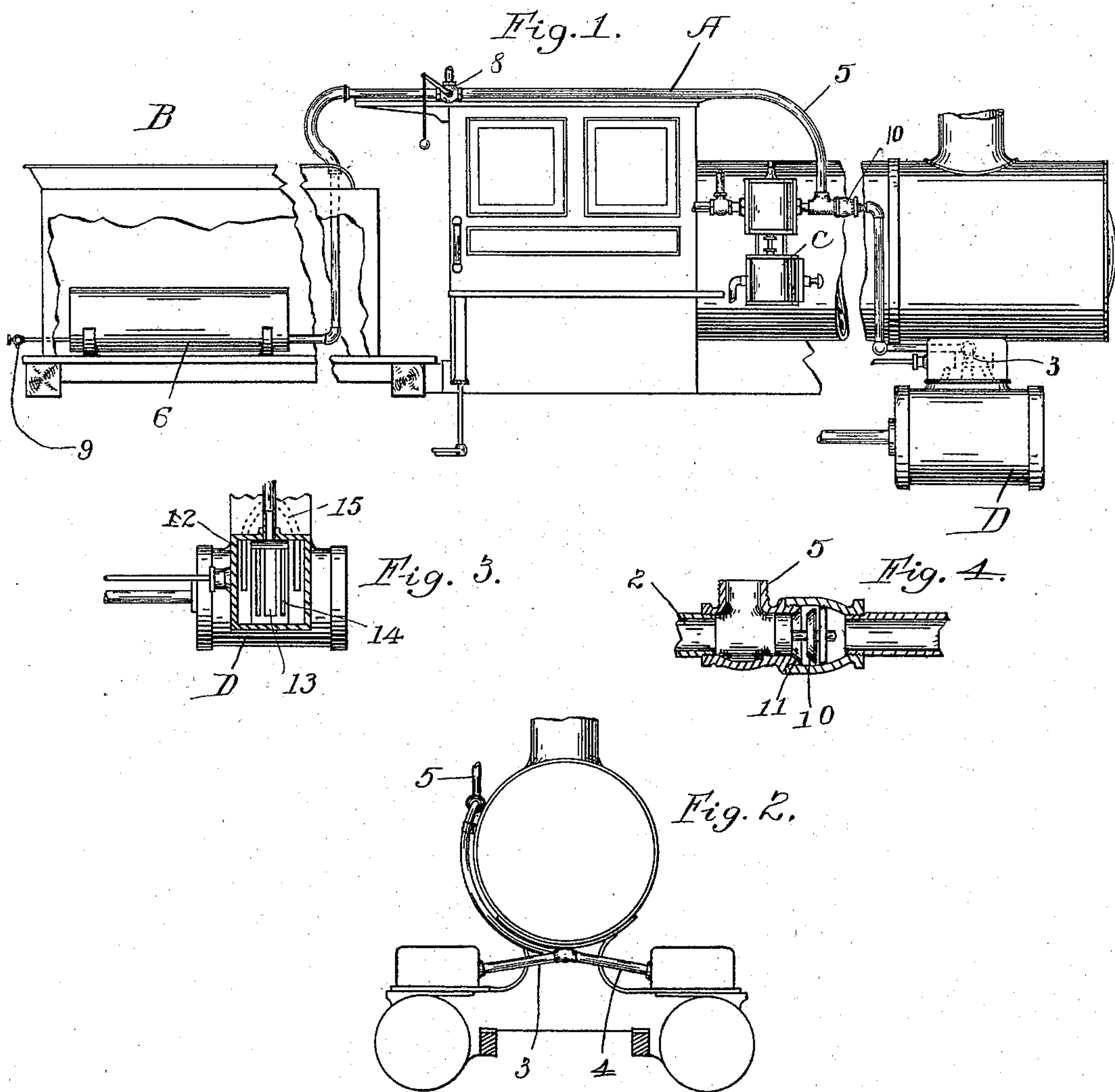


(No Model.)

I. F. WALLACE & W. L. KELLOGG.
EXHAUST STEAM LUBRICATOR AND FEED WATER HEATER FOR
LOCOMOTIVES.

No. 598,687.

Patented Feb. 8, 1898.



Witnesses:

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W. L. Kellogg.

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UNITED STATES PATENT OFFICE.

IRA F. WALLACE AND WILLIAM L. KELLOGG, OF ST. PAUL, MINNESOTA.

EXHAUST-STEAM LUBRICATOR AND FEED-WATER HEATER FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 598,687, dated February 8, 1898.

Application filed February 15, 1897. Serial No. 623,554. (No model.)

To all whom it may concern:

Be it known that we, IRA F. WALLACE and WILLIAM L. KELLOGG, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Exhaust-Steam Lubricators and Feed-Water Heaters for Locomotives, of which the following is a specification.

Our invention relates to improvements in attachments for locomotive-engines, its object being to provide means for heating and lubricating the cylinders and connecting parts when the engine is not working and for heating the feed-water when the engine is working.

To this end our invention consists in connecting the steam-exhaust port of the pump-engine of the air-brake system with a condenser in the water-tank of the tender and also with the steam-chests of the cylinders. A valve interposed in the pipe leading to the steam-chests is adapted to be closed by back pressure of live steam in them when the locomotive-engine is working, so as to force the exhaust from the air-pump into the condenser, thereby heating the feed-water. A suitable manually-operated valve is arranged in the pipe leading to the condenser, so that steam can be exhausted from the same to the outer air to prevent overheating of the feed-water. When steam is cut off from the steam-chest by means of the main throttle, the pressure is removed from the valve in the pipe connecting the chests with the pump-engine, allowing the steam to pass from it into the valve-chest and connected channels and passages, thus warming and lubricating them. If the locomotive is running with steam cut off, partial vacuum is caused in each chest by the action of the slide-valve and piston, and the exhaust from this pump-engine serves to supply this vacuum.

Our invention further consists in the features of construction hereinafter more particularly described and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a partial side elevation of a locomotive fitted with our improvements and broken away to better show the same. Fig. 2 is an end view of Fig. 1. Fig. 3 is a plan of one of the piston-cylinders of ordinary construction, showing the valve-chest in section with the slide-valve re-

moved; and Fig. 4 is a sectional detail illustrating the three-way valve used in connection with our invention.

In the drawings, A represents the locomotive; B, the tender; C, the air-pump engine of the air-brake system having the usual connections, and D the cylinders. The exhaust-port of the air-pump engine is connected by means of the main pipe 2 and the branch pipes 3 and 4 with the steam or valve chest 12 of the cylinders D. The steam-chest is shown in section in Fig. 3, with the slide-valve removed, exposing the inlet and exhaust ports 13 and 14, respectively, connecting the chest with the cylinder. Exhaust-passages 15 convey the exhaust-steam from the steam-cylinders D to the smoke-stack. The pipe 5 is also connected with the pipe 2 and leads back to the condenser 6, of any suitable construction, arranged in the tank of the tender. Interposed in this pipe at the engine-cab is the manually-operative valve 8, adapted to be opened by the engineer, when necessary, to exhaust the steam into the outer air and thus prevent the overheating of the water in the tank.

9 is a drainage-valve connected with the condenser to draw off the water of condensation therefrom.

Arranged in the pipe 2, beyond the union of the pipe 5 therewith, is the valve 10, opening away from the pump-engine and having the valve-seat 11.

The operation of the apparatus is clearly understood from the drawings and foregoing description. When the locomotive is working, the live-steam pressure in the steam-chests causes back pressure through the pipe 2 sufficient to close the valve 10 and cause the exhaust-steam from the pump-engine to flow through the pipe 2 into the condenser, thereby heating the feed-water of the tank. When the live steam is cut off from the steam-chests by the closing of the throttle, the back pressure upon the valve 10 is removed and the exhaust-steam from the pump-engine flows therethrough to supply the partial vacuum caused by the operation of the slide-valves and pistons, if the locomotive be running, and also to heat and lubricate the parts, the steam thence passing from the cylinders through exhaust-channels.

If the locomotive is at rest, the exhaust-steam from the air-pump engine serves to keep the valve-chests and connected channels warm and lubricated.

5 We claim—

1. In a locomotive, the combination with the pump-engine of the air-brake system, the steam-chests and their cylinders, and the water-tank, of the conduits connecting the exhaust-port of said engine with said steam-chests and water-tank, and the automatically-actuated valve for said conduits, by means of which the exhaust from said engine is conducted to the steam-chests when live steam is shut off therefrom, and conducted to the water-tank to heat the feed-water when live steam is being admitted to the steam-chests.

2. In a locomotive, the combination with the auxiliary engine of the air-brake system, the steam-chests, and water-tank, of means automatically controlled by the pressure of live steam in the steam-chests for conducting the exhaust-steam from said engine to the

water-tank, and permitting said exhaust to pass into said steam-chests when the live steam is cut off therefrom. 25

3. In a locomotive, the combination with the engine of the air-brake system, the steam-chests and water-tank, of the condenser arranged in said water-tank, the pipes connecting the exhaust-port of said engine with the steam-chests and said condenser, and the valve in the pipe leading to the steam-chests adapted to be closed by the back pressure of live steam, whereby when live steam is cut off from the chests the exhaust from said engine will enter the same, and when live steam is admitted to said chests the exhaust from said engine is forced into said condenser. 30 35

In testimony whereof we affix our signatures in presence of two witnesses. 40

IRA F. WALLACE.

WILLIAM L. KELLOGG.

Witnesses:

MINNIE L. THAUWALD,

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