(No Model.)

2 Sheets—Sheet 1.

C. M. LAKE.

LOCOMOTIVE ASH PAN.

No. 302,915. Patented Aug. 5, 1884.

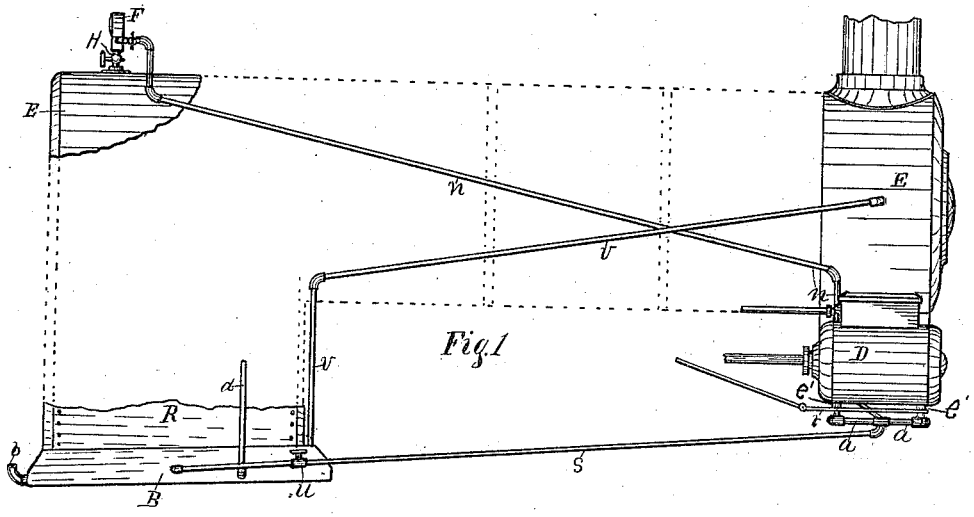

Fig. 1

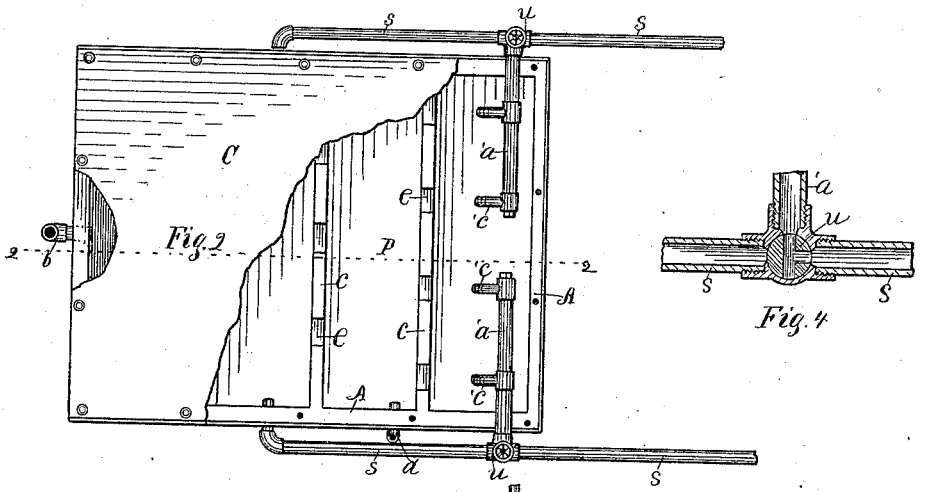

Fig. 2

Fig. 4

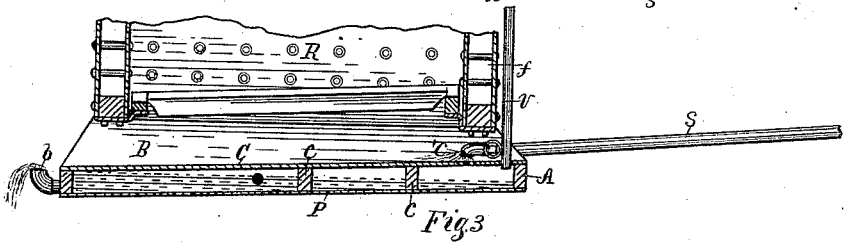

Fig. 3

Witnesses:
John C. Perkins
John H. Chase

Inventor:
Charles M. Lake
By Lucius C. West
Atty.

(No Model.) 2 Sheets—Sheet 2.

C. M. LAKE.

LOCOMOTIVE ASH-PAN.

No. 302,915. Patented Aug. 5, 1884.

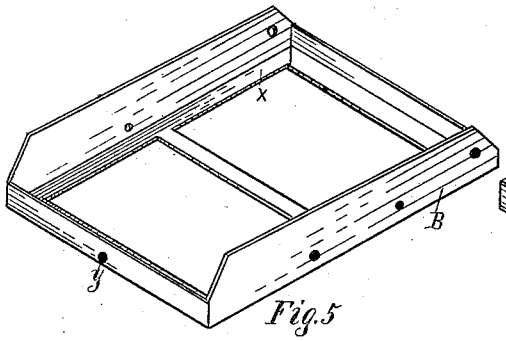

Fig. 5

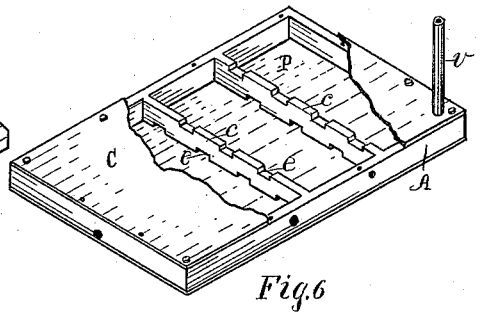

Fig. 6

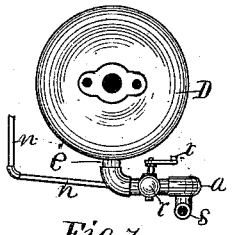

Fig. 7

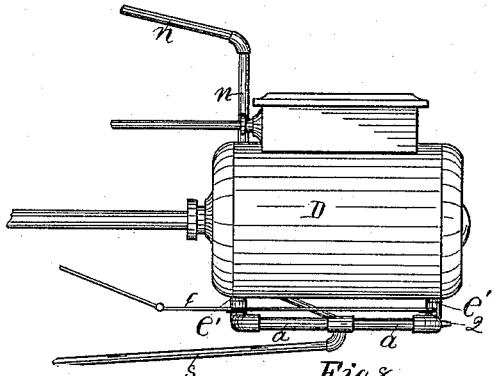

Fig. 8

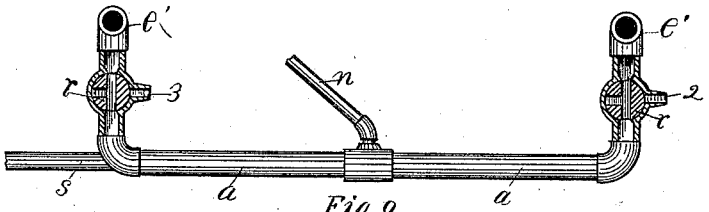

Fig. 9

Fig. 11

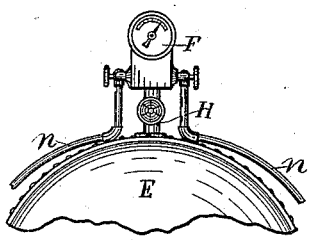

Fig. 10

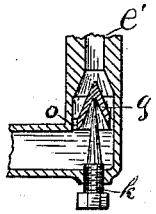

Fig. 12

Witnesses.
John C. Perkins
John H. Chase

Inventor.
Charles M. Lake
By Lucius C. Weist
Atty.

UNITED STATES PATENT OFFICE.

CHARLES M. LAKE, OF JACKSON, MICHIGAN.

LOCOMOTIVE ASH-PAN.

SPECIFICATION forming part of Letters Patent No. 302,915, dated August 5, 1884.

Application filed April 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. LAKE, a citizen of the United States, residing at Jackson, county of Jackson, State of Michigan, have invented a new and useful Improvement in Locomotive Ash-Pans, of which the following is a specification.

My invention consists in an improved apparatus to utilize the exhaust-steam from the cylinder, in preventing the contents of the ash-pan from freezing, and in clearing the ash-pan of said contents. Other incidental objects will appear in the description and claims.

In the drawings forming a part of this specification, Figure 1 is a side elevation of a locomotive-boiler with apparatus attached, parts being broken away; Fig. 2, a top view of the ash-pan, parts being broken away; Fig. 3, a section of Fig. 2 on line 2 2 and a vertical broken section of the boiler-arch, with which the ash-pan is connected; Fig. 4, a broken detail of Figs. 1 and 2, in section, enlarged; Fig. 5, a perspective view of the skeleton-frame of the ash-pan; Fig. 6, a perspective of condenser-bottom to ash-pan, with parts broken away; Fig. 7, end view of Fig. 8; Fig. 8, side elevation of a cylinder enlarged, with connected parts broken away; Fig. 9, a top view of a portion in Figs. 1 and 8, enlarged; and Fig. 10 is an end view of the upper portion of the boiler in Fig. 1; Fig. 11, a check-valve, and Fig. 12 a section of pipe, showing its location and use.

The boiler is illustrated in Fig. 1 at E, portions being in dotted lines.

D is one of the cylinders, the other being on the opposite side, in the usual manner of locomotive-engines. The exhaust-ports e' e' of the cylinder D, on the under side thereof, are provided with pipes in which the stop-cocks r r are located. These stop-cock pipes extend laterally toward the trucks, (not here shown,) Figs. 7 and 9, and are connected by a pipe, a. The three-way stop-cocks or valves r r are connected by an operating-rod, t. The use of these cocks is explained in the description of the operation. In the ports e' e' may be located valves g, which will admit the passage of steam out of the ports and prevent its return, as shown in Figs. 11 and 12. A pipe, S, connects the pipe a with a steam-condenser, A, beneath the arch or fire-place R of the boiler E. A heater-pipe, n, connects the pipe a of one cylinder with said pipe of the other cylinder on the opposite side, (not here shown,) by passing over the boiler E, Figs. 1 and 10.

The skeleton ash-pan frame B is provided with a detachable bottom, A, said bottom being the condenser heretofore mentioned, Figs. 5 and 6. This condenser consists of a frame and an upper and lower inclosure, C P, bolted to said frame. In Fig. 6 the upper inclosure, C, is broken away, showing central supports, c c. These supports are provided with notches e e, to admit the passage of steam and water all through the condenser. The steam-pipe S passes through the side wall of the skeleton-frame B and enters the condenser, one on each side from each cylinder, as shown in Fig. 2. Pipes a' a' are connected with the pipe S, and extend laterally therefrom over the front end of the condenser A. These pipes a' a' are provided with ports c', for admitting steam into the ash-pan and blowing the contents therefrom. This is done by turning the three-way cocks u, Fig. 4, in a manner to shut the steam from entering the condenser and admitting it into the pipes a', as in said figure. Draft-pipes v v are connected with the corners of the condenser and extend to the rear of the boiler-flues, and enter below the smoke-stack in the usual manner. The condenser is provided with a discharge-pipe, b, which is extended upward, terminating at a proper height to govern the desired amount of water in the condenser.

The pipe d is designed to connect with the exhaust-pipes of a steam-propelled engine which operates the brakes, in order to convey the exhaust-steam from said engine into the condenser. Thus all the exhaust-steam from the entire locomotive construction is conveyed to the same condenser. This engine and exhaust-pipes which are to connect with pipe d are not here shown, said pipe d being extended upward and broken away.

When the three-way cocks r r are set, as in Fig. 9, the exhaust-steam from each end of the cylinder D is conveyed to the condenser A, where it is converted into water which keeps hot and prevents the contents of the ash-pan resting on the plate C from freezing in cold weather. It prevents visible exhaust-steam, and the steam may be used to free the

ash-pan of its contents, which two latter-named functions are useful, even in warm weather. By turning the stop-cocks in the proper position the exhaust-steam may be blown out of ports 3 2, Fig. 9.

Near the front of the boiler, on top, is an indicator, F, connected with the boiler E by heater-pipe H. With this pipe and indicator are connected the branch heater-pipes *n*, hereinbefore referred to. The pipes H and *n* are provided with stop-cocks, as in Figs. 10 and 1. By this means steam may be circulated from the boiler through the pipes *n*, H, and S, into the condenser when the exhaust-ports of the cylinders are closed by the stop-cocks *r r*, to prevent danger of freezing up. By means of the indicator the engineer can tell from the oscillation of the hand that the exhaust-ports *e' e'* are open, as a greater circulation of steam passes through the pipes *n n* when said stop-cocks *r r* are turned to open the ports *e' e'*.

Having thus described my invention, what I claim as new is—

1. The combination, with a cylinder and a pipe connecting the ports, provided with the three-way cocks and check-valves, of a condenser located beneath the ash-pan, and a connecting-pipe adapted to convey the exhaust-steam to said condenser, substantially as set forth.

2. The combination, with a cylinder having the connecting-pipe between the ports and provided with the three-way stop-cocks, of the ash-pan frame, and detachable condenser-bottom, and pipe adapted to convey the exhaust-steam to said condenser, substantially as set forth.

3. The combination, with an ash-pan and condenser in the relation shown, of a cylinder or cylinders provided with pipes connecting the cylinder exhaust-ports with the condenser, said pipes provided at the cylinder-ports with three-way cocks and check-valves, and provided at the ash-pan with lateral branches for blowing out said pan, having at the juncture of said pipe and lateral branches three-way cocks, whereby steam may be let into the branches or the condenser, substantially as set forth.

4. The combination, with the cylinders, an indicator, a pipe connecting said indicator with the boiler, and heater-pipes connecting the indicator with the exhaust-ports of the cylinders, of an ash-pan and condenser and pipes connecting the exhaust-ports with said condenser, said exhaust-ports provided with suitable stop-cocks and check-valves, all substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in the presence of two witnesses.

CHARLES M. LAKE.

Witnesses:
JOHN H. CHASE,
CLARK F. JOHNSON.