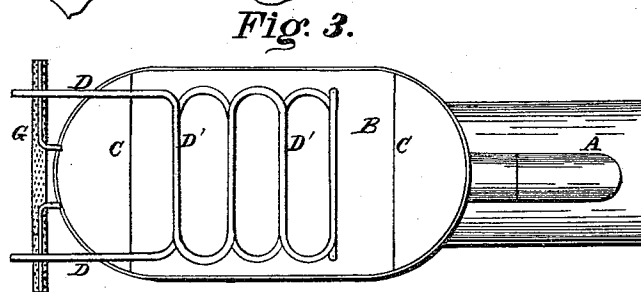
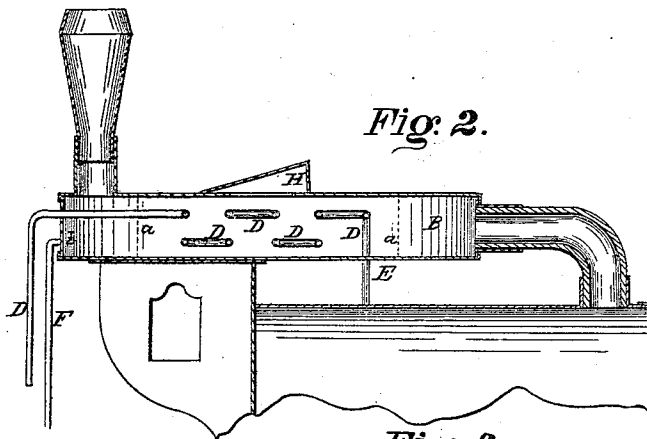
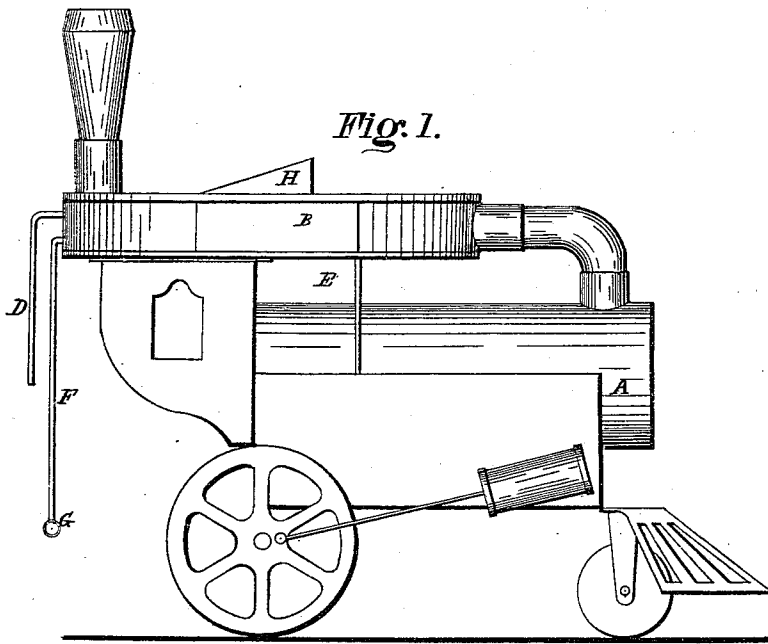


R. L. HARRIS & O. H. BOGARDUS.
Locomotives.

No. 148,950.

Patented March 24, 1874.



Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT L. HARRIS, OF GROSSE ISLE, MICHIGAN, AND OVA H. BOGARDUS,
OF SYRACUSE, NEW YORK.

IMPROVEMENT IN LOCOMOTIVES.

Specification forming part of Letters Patent No. **148,950**, dated March 24, 1874; application filed
December 20, 1873.

To all whom it may concern:

Be it known that we, ROBERT L. HARRIS, of Grosse Isle, in the county of Wayne and State of Michigan, and OVA H. BOGARDUS, of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements on Locomotives, of which the following is a description, reference being had to the accompanying drawings making a part of this specification.

The objects of our invention and the results obtained are the utilizing of the water of the exhaust steam for sprinkling the track of a railroad, the utilizing of the heat of the smoke, gases, and hot air of the furnace, and also the heat of the cinders, after all or any of them have passed the smoke-box, in warming the water before its use in the boiler. We also obtain the extinguishment of cinders.

Figure 1 is a side elevation of a locomotive having attached thereto the improvements. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a plan view of the same with the top removed to show the inside.

Like letters of reference refer to like parts in the several views.

The exhaust steam, smoke, cinders, &c., or either of them, after passing the smoke-box A, are passed into a receptacle or chamber, B, which forms part of the smoke-stack, and which is placed as shown in the drawing, or in any convenient position. This chamber B referred to may be provided with one or more screens, C, Fig. 3, arranged transversely across each end of the chamber or otherwise. Said screens are also indicated by the dotted lines *a*, Fig. 2, for the more effectual separation of the cinders. From the tender or supply-tank the water is pumped or injected through one or more pipes, D. Said pipes pass through the chamber B in a coiled or serpentine manner, as shown in Fig. 3, D', and from thence the water is conveyed to the boiler by the eduction-pipe E. At any desirable elevation, as at *b* in the chamber, is placed one or more surplus pipes, F, conveying the surplus water to a sprinkler, G, from whence it falls to the road, laying the dust and preventing injury from fire to the ties.

The advantage of this condensing-chamber in this respect is that it utilizes the water obtained from the condensed steam, which would otherwise be generally wasted, and applies the same to a very useful purpose, thereby avoiding the necessity of hauling water over the road for this special purpose.

The pipes D' may either convey the water intended for the boiler through the receptacle or chamber, as shown in the drawings, or, using the chamber in the opposite manner, convey the exhaust steam, &c., through the water. The damper or valve shown at H is conveniently attached to the receptacle, and so arranged as to be adjusted to the speed of the engine or the necessity for draft.

The operation is as follows: Water is forced from the tender or supply-tank, through the supply-pipes D, toward the boiler, being warmed on its way by the heat of the exhaust steam, smoke, hot air, gases, cinders, and condensed water, which are in the receptacle B. The exhaust steam, in passing through the chamber, is condensed, and falls as water. The surplus, rising above any desired elevation, as at *b*, passes through the surplus-pipe F to the sprinkler G, or wherever desired. In the condensation of the steam and parting of caloric by the smoke, &c., portions of the cinders fall into the water, and part are caught by the screens C, which also drop into the water and are extinguished, their heat aiding to warm the water on its passage to the boiler. The cinders are eventually removed, automatically or by hand.

The valve or damper H is so placed and arranged that it may be regulated by the engine-man, or by the speed of the engine—the faster the motion of the engine the more need for increased draft.

The chamber B, having a large surface in contact with the air, aids in condensing the steam; and, in addition, there may be placed within it any of the well-known devices for condensation, as a jet of spray, &c.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A sprinkler device, G, in combination with a condensing-chamber, B, in which the exhaust

steam is condensed to furnish water for the sprinkler, substantially for the purpose set forth.

2. A condensing-chamber, B, communicating directly with the smoke-box of a locomotive, having supply-pipe D passing through said chamber, and provided with an outlet-pipe, F, connected to a sprinkler, substantially as and for the purpose specified.

3. The condensing-chamber B, provided with pipes D and F, in combination with screens C and damper H, when constructed and arranged as and for the purpose herein described.

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Witnesses:

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