

(No Model.)

J. WILLIAMS.
LOCOMOTIVE ASH PAN.

No. 499,866.

Patented June 20, 1893.

Fig 1

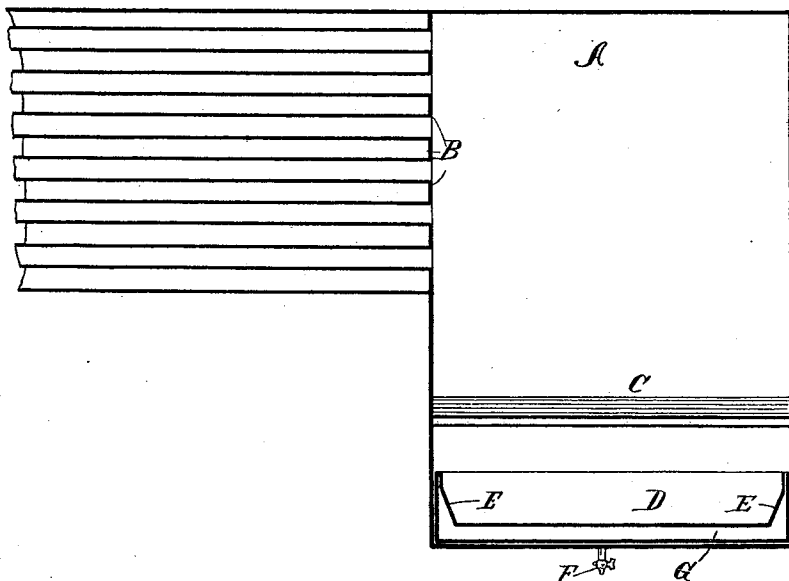
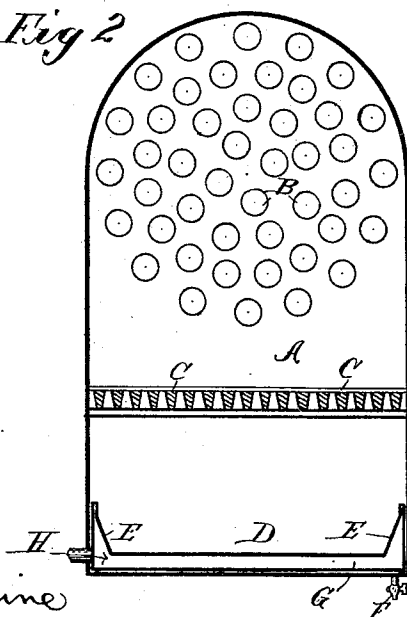


Fig 2



WITNESSES:

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JOHN WILLIAMS, OF STERLING, ILLINOIS.

LOCOMOTIVE ASH-PAN.

SPECIFICATION forming part of Letters Patent No. 499,866, dated June 20, 1893.

Application filed February 18, 1893. Serial No. 462,896. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAMS, a citizen of the United States, residing at Sterling, in the county of Whiteside and State of Illinois, have invented certain new and useful Improvements in Locomotive Ash-Pans; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention more especially pertains to means for preventing the accumulation of frozen material in the ash pan of locomotives, by which the air draft is choked, the fire deadened, and the further making of steam prevented. It is well known to practical locomotive engineers that one of the most annoying and perplexing matters incident to railroading in cold weather is the accumulation of frozen ashes, intermixed with ice, and sometimes with snow, which fills the ash pan up to the bottom of the fire grate. All of the air which feeds the fire, and passes with the products of combustion, through the boiler flues and out at the smoke stack, is drawn, by the intense heat of the fire under the boiler and by the steam exhaust in the stack, up through the grates which form the bottom of the fire box. This constant current of air, passing upward between said grates, is so strong, particularly when the engine is working, that the lower surfaces of said grates are kept cool. Directly under the grate area is suspended the ash pan, to catch and retain the coals of fire which drop between the grates from the fire box. To permit these coals to drop directly to the ground would ignite the bridges, trestles and other wooden structures over which the engine passes. As some of these coals are quite small, it is necessary that the ash pan have a tight bottom. The aforesaid current of air, passing over the ash pan, soon deadens said coals thereon, and the intermixed dead coals and ashes rapidly accumulate on the ash pan, and are pushed off the ends of the pan while the train stops, with a hoe or other scraper. There is constantly more or less dripping of water from the boiler into the end

of the fire box, which constantly drops from the latter down and upon the ash and coal accumulation in said ash pan. In cold weather this dripping water intermixes and freezes with the ashes as it falls. If there be snow, it also mixes into the frozen compound, which latter, frozen to the upper surface of the bottom of the ash pan at the initiate, gradually piles and increases until it has filled all of the space between the ash pan and the fire grates, and by excluding the air from the fire box, precludes combustion in the latter, interrupts the generation of steam, and the engine dies. This frozen mass, from the character of its mixture and its location, is difficult to remove. Thawing it out with a jet of steam or stream of hot water is inconvenient and tedious. I have known engines this winter to have died from above cause while running, and they had to be drawn to an engine house, and held there six hours, thawing out the ash pan contents, before they were ready to go again on the road. The evil complained of is not only troublesome, often occurring at the most unpropitious times, and when the train men are distant from engine houses, struggling with snow drifts, but also it entails incalculable inconvenience and loss to the company.

The purpose of my invention is to obviate this difficulty by preventing its beginning. It is obvious that if the contents of the ash pan can be kept from freezing, there is no more trouble in hoeing it off in winter than in summer. This I propose doing by inclosing against the bottom and sides of the ash pan, a steam tight chamber, and supplying the latter with steam from the engine boiler. This auxiliary chamber may be sufficient if under only the bottom of the ash pan. But inasmuch as the engine must sometimes meet extremely cold weather, and the additional space requisite to cover the sides is trifling, I prefer to be prepared for the most trying conditions. In devices of this kind heretofore constructed, they have not been made steam tight, that is, so that the steam could be retained therein until it was condensed by contact with the cold walls of the pan, but they have had an open passage from the pan at all times. With such a construction as this, the loss of steam is so great as to render it entirely too wasteful to use live steam, and as exhaust steam

can only be used when the locomotive is running, such devices have not been found practical successes. To obviate these objections, I render the chamber steam tight so that after the steam enters the chamber, it is retained therein and is condensed and forms hot water, until the volume of water becomes so great as to encroach upon the space required for the desired amount of steam. When the accumulation of the water becomes so great as to affect the utility of the device, the cock F, or other closure for the pan is opened and the water is permitted to escape, after which the cock is closed and the pan is ready to be filled with a fresh supply of steam. I accomplish the above purpose by the mechanism illustrated in the accompanying drawings, in which—

Figure 1. is a perspective of a locomotive fire box and ash pan provided with my invention. Fig. 2. is a vertical cross section thereof.

Similar letters refer to similar parts throughout both the views.

As the general construction of the engine is well known, and my invention pertains to only a part thereof, I do not deem it necessary to show or describe any more of the engine than will serve to render clear the attachment and operation of my invention.

A is the usual fire box of a locomotive engine, provided with flues B.

C. C. are grate bars suitably supported longitudinally in the bottom of the box A.

D. is the ash pan, supported from its sides to the sides of said fire box, in the usual mode, and extending under all of the grate surface, to catch the ashes and coals dropped between said grate bars. The ash pan is usually constructed with vertical sides, but I prefer to construct mine with sides E. E. extending diagonally downward and inward, or in other words, with flaring sides, the bottom of the pan being narrower than the top. This is for the purpose of providing a steam space against the sides of the pan D.

G. is a steam tight chamber formed against the bottom and sides of the pan D. and provided on its bottom with the water cock F. to periodically let out the condensation.

H. represents a steam pipe leading from some convenient and suitable part of the boiler and entering the steam chamber G. preferably at the side of the latter so as not to obstruct access to the ends of the ash pan D. The chamber G. is riveted steam tight at

its side and end margins to the pan D. or, at its sides to the fire box A. in any suitable mode, to form a steam chamber against the exterior surfaces of the bottom and sides of pan D. and yet let the ends of the latter unobstructed as they now are. The bottom of the chamber G. extends about three and one-half inches below the bottom of the pan D. The chamber G. has closed ends.

The operation of my invention is as follows:—Steam, as required is admitted into pipe H. from a cock or valve at the boiler end of the latter, under the control of the engineer, which, passing into the chamber G. keeps the bottom and sides of ash pan D. so hot that ashes, water and snow deposited on the latter are prevented from freezing and can be removed at intervals, as is now done in warm weather. When the condensation in chamber G. is sufficient to require it, the cock F. can be temporarily opened.

The size and conformation of the parts may be varied. So, also the steam may be admitted to chamber G. at some other locality on the latter, but I prefer the side, that the pipe H. may not obstruct access to the ends of the ash pan D., for the purpose of cleaning the latter.

Any method of discharging steam or hot water directly upon the contents of the ash pan is detrimental in two directions; the steam is drawn into the fire and clinkers the coal, and the outside steam congeals on the cab windows and otherwise obscures the forward view of the engineer.

From my own experience of seven years as a locomotive engineer, I am confident that my invention will be of great advantage to the company, the train men and the public shipping or traveling upon the road.

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

In combination, an ash pan for a locomotive, a steam tight chamber inclosed against the same provided with a steam inlet, and means for opening and closing the chamber at intervals for the escape of water, substantially as set forth.

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

JOHN WILLIAMS.

Witnesses:

JOHN G. MANAHAN,
M. I. MANAHAN.