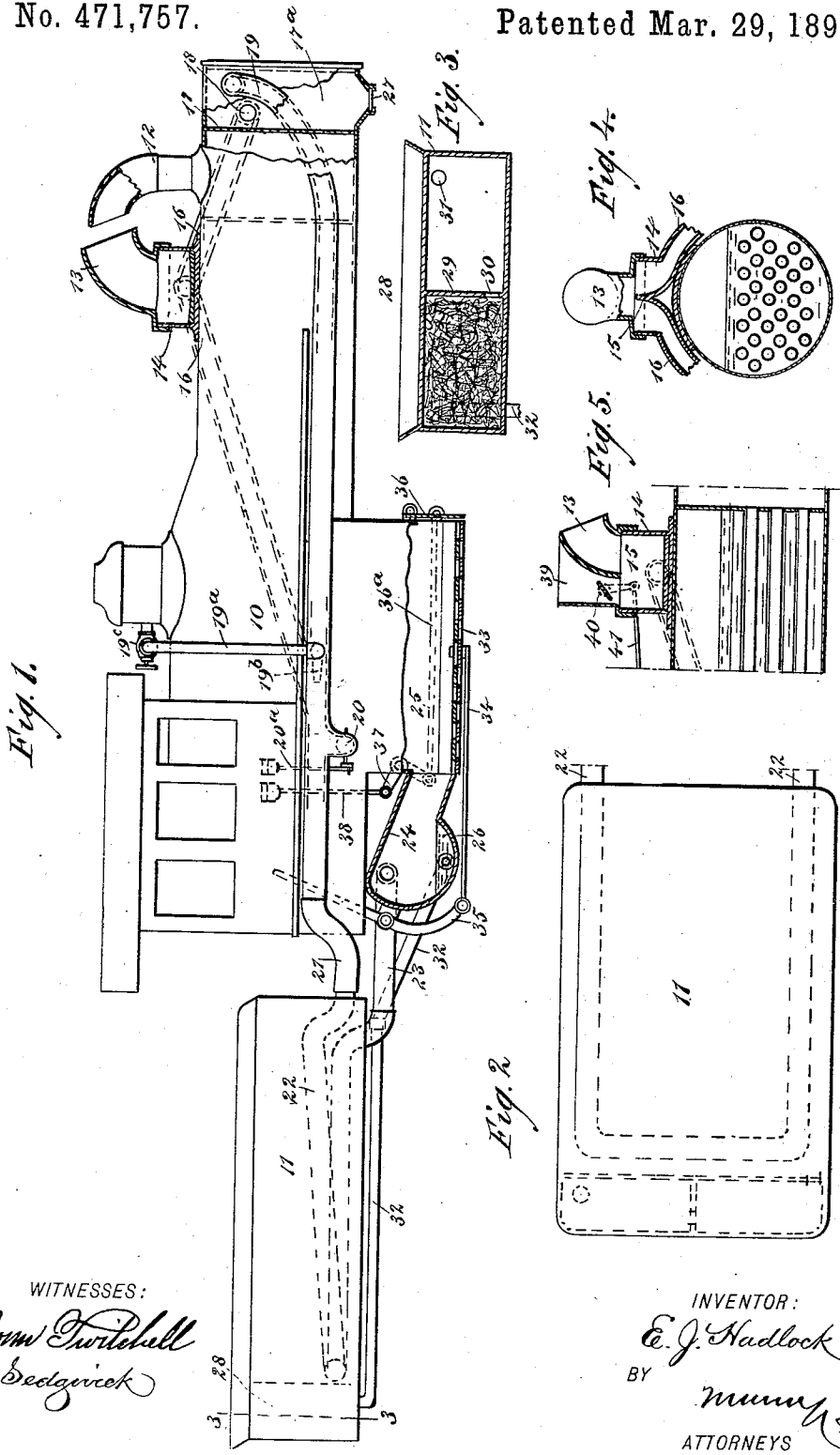


(No Model.)

E. J. HADLOCK.
SMOKE CONSUMER.

No. 471,757.

Patented Mar. 29, 1892.



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EDSON J. HADLOCK, OF BIG SPRING, TEXAS.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 471,757, dated March 29, 1892.

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To all whom it may concern:

Be it known that I, EDSON J. HADLOCK, of Big Spring, in the county of Howard and State of Texas, have invented a new and improved Smoke-Consumer, of which the following is a full, clear, and exact description.

My invention relates to improvements in smoke-consumers; and the object of my invention is to produce a smoke-consumer which is especially applicable for use on railway-locomotives, which will cause the smoke to be returned from the stack to the fire-box until it is entirely consumed, and which also serves to condense and save the exhaust-steam and to incidentally heat the water in the tender.

To this end my invention consists of a smoke-consumer constructed substantially as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken side elevation, partly in section, of a locomotive provided with my improved smoke-consumer. Fig. 2 is a detail plan view of the tender. Fig. 3 is a cross-section through the tender on line 3-3 in Fig. 1. Fig. 4 is a broken transverse section showing in detail the construction of the smoke-receiver, and Fig. 5 is a broken longitudinal section of a modified form of the receiver.

The locomotive 10 is of the ordinary kind and is provided with the usual tender 11 and with a curved smoke-stack 12, which is arranged to deliver into a similarly-curved receiver 13, which is arranged immediately behind the stack, the receiver being large enough to easily carry off all of the smoke that issues from the stack.

The receiver 13 is mounted upon a box 14, which box has a central conoidal partition 15 extending longitudinally through it, and opening from each side of the box near the bottom are pipes 16. These pipes are large enough to easily carry off all the smoke and cinders which issue from the smoke-stack, and when the locomotive is provided with an extension-front the smoke-box is divided by a transverse partition 17, and the pipes 16 are arranged to deliver into the front compartment 17^a of the smoke-box, as shown in Fig. 1. The

cinders will thus collect in this compartment 17^a, and the compartment is provided with outlet-pipes 19, which extend along the sides of the locomotive and which have a vent at 20, so that the coarser particles of matter which are carried through the pipes may be delivered into the fire-box of the locomotive, and these outlets are controlled by valves which have hand-levers 20^a extending into the locomotive-cab. Steam-pipes 19^a lead from the dome of the boiler and have rearwardly-extending jets 19^b at their lower ends, which jets enter the pipes 19 near the vents 20. The pipes 19^a are controlled by a valve 19^c, and when the locomotive is not running steam is let on through the pipes 19^a, and will thus keep up the circulation through the consuming apparatus.

The pipes 19 extend to the rear portion of the cab and connect by means of a coupling 21 with a pipe 22, which pipe extends around the tender within the water-tank and delivers through a coupling 23 into the chute 24, which chute is arranged to deliver into the ash-pit 25 and has its bottom curved downward, as shown at 26, so that the water formed by the condensation of the steam in passing through the pipe 22 will settle in this receptacle and thus be saved; but, if desired, the water may be allowed to run to waste. By carrying the pipe 22 around within the tender it acts like the coil of a still, condensing the steam, so that the condensed water will settle in the bottom of the chute 24, and fitting the other products of combustion for complete consumption. The volatile gases and other products of combustion which do not condense will pass into the ash-pit and be drawn up through the grate into the fire and consumed. The heavy cinders will settle in the compartment 17^b of the smoke-box, and this compartment is provided with a removable slide 27 at the bottom, so that when it is filled the slide may be removed and the compartment cleaned out. In the rear end of the tender and behind the water-tank is a compartment 28, (shown by dotted lines in Fig. 1,) and this compartment is divided into two parts by a vertical partition 29, through which, near the bottom, is a hole 30, and one part of the compartment 28 communicates with the tank in

the tender by means of a vent 31 near the top of the compartment, as shown in Fig. 3. The other part of the compartment is filled with straw or hay and sand or some other suitable filtering material and is connected by means of a pipe 32 with the receptacle 26 of the chute 24. This pipe 32 may be provided with a pump, so that the water collected in the receptacle 26 may be forced into the compartment 28 and will be delivered into the part of the compartment containing the filtering material, so that the water which runs through openings 30 and 31 and into the water-tank of the tender will be comparatively clean, and when the filtering material becomes foul it may be cleaned out.

The ash-pit 25 is provided with a sliding grate 33 at the bottom, which connects by means of a rod 34 with a lever 35, and the lever extends upward into the cab, so that it may be operated from the cab to shift the grate and allow the ashes to drop through. The ash-pit is also provided at the front end with a swinging door 36, which is likewise connected with the cab by means of a rod 36^a, bell-crank lever 37, and hand-lever 38, and by swinging the door the draft may be regulated.

When the locomotive to which this consumer is to be applied is not provided with an extension-front, the pipes 16 are arranged to extend directly to the fire-box and to the pipe 22 in the tender, as shown by dotted lines in Fig. 1, and it is obvious that the principle of the invention is the same in either case.

In Fig. 5 I have shown the receiver 13 provided at the back with an opening 39, which communicates with the box 14, and this opening is adapted to be closed by a valve 40, which connects by means of a lever and rod 41 with the cab of the locomotive, and by regulating this valve a portion of the gases received from the stack may be allowed to escape.

From the foregoing description it will be seen that the receiver 13 is arranged in relation to the stack, so that it affords no impediment to the draft and the receiver is large enough so that a considerable quantity of air will be drawn through the pipes 16 with the gases and smoke from the stack, and the oxygen thus inspired will serve to promote combustion and cause all the matter to be entirely consumed. It will also be noticed that carrying the hot products from the smoke-stack through the water-tank in the manner described causes the water in the tank to be heated, so that it will be in good condition to inject into the boiler, and it will also con-

dense the steam, so that a large quantity of water may be saved.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a locomotive having a curved smoke-stack, of a curved receiver arranged to receive the smoke from the stack and pipes leading from the receiver through the water-tank of the tender and into the ash-pit of the locomotive, substantially as described.

2. The combination, with a locomotive having a curved smoke-stack, of a curved receiver arranged to receive the smoke of the stack and pipes leading from the receiver through the water-tank of the tender and into the ash-pit of the locomotive, said pipes having a valve-controlled vent opening into the fire-box, substantially as described.

3. The combination, with a locomotive having a curved smoke-stack and a compartment in the smoke-box, of a curved receiver arranged to receive the smoke from the smoke-stack, pipes leading from the receiver into the compartment of the smoke-box, and pipes leading from said compartment to the fire-box and ash-pit of the locomotive, substantially as described.

4. The combination, with a locomotive having a curved smoke-stack and a compartment in its smoke-box, of a curved receiver arranged to receive the smoke from the stack, pipes leading from the receiver into the compartment of the smoke-box, and pipes leading from said compartment through the water-tank of the tender and into the ash-pit of the locomotive, substantially as described.

5. The combination, with a locomotive having a curved smoke-stack, of a curved receiver arranged to receive the smoke from the stack, a chute arranged to deliver into the ash-pit of the locomotive and having a water-holding receptacle therein, and pipes leading from the receiver through the water-tank of the tender and into the chute, substantially as described.

6. In a smoke-consumer, the combination, with a receiver, a condensing-pipe, and a receptacle connected with the pipe, of a filter arranged in the tender and adapted to deliver into the water-tank of the tender, and a pipe leading from the receptacle to the filter, substantially as described.

EDSON J. HADLOCK.

Witnesses:

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