

No. 752,676.

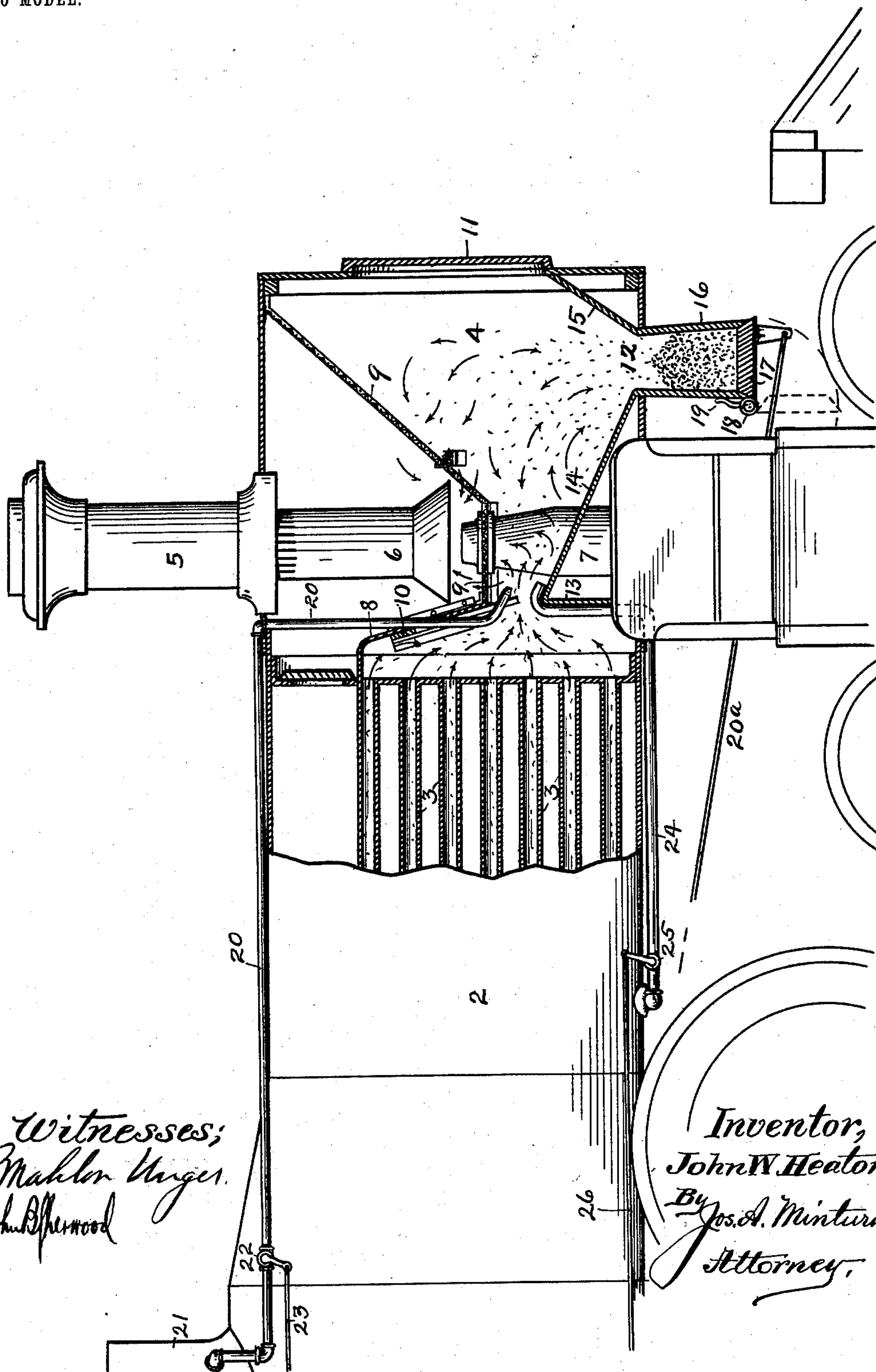
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SPARK ARRESTER, EXTINGUISHER, AND DISCHARGER.

APPLICATION FILED MAY 25, 1903.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

JOHN W. HEATON, OF INDIANAPOLIS, INDIANA.

## SPARK ARRESTER, EXTINGUISHER, AND DISCHARGER.

SPECIFICATION forming part of Letters Patent No. 752,676, dated February 23, 1904.

Application filed May 25, 1903. Serial No. 158,729. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. HEATON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Spark Arresters, Extinguishers, and Dischargers, of which the following is a specification.

The object of this invention is to separate the sparks or heated cinders from the smoke of a steam-generating boiler and allow the smoke to escape to atmosphere, while retaining the cinders.

The further object is to thoroughly cool and dampen the cinders and to provide means for discharging the cinders in a practically cold and dampened condition at intervals to prevent obstructive accumulation without admitting air at such discharge, so as to interfere with the draft.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawing, which represents the front end of a tubular boiler and the smoke-box of a locomotive in vertical section with my invention applied and shown in operative position.

2 is the boiler, having the tubes 3.

4 is the smoke-box, 5 the smoke-stack, and 6 the petticoat or clearance pipe discharging into the smoke-stack.

7 is the exhaust-nozzle into which the exhaust-steam from the cylinders of the engine discharge and through which the steam is discharged into the petticoat-pipe to create a draft up the smoke-stack.

8 is the deflecting-plate to deflect the smoke and cinders issuing from the upper tubes of the boiler downwardly, and 9 9 is the wire-netting extending from the bottom of the deflecting-plate forward to the front end of the smoke-box, forming a strainer through which the smoke must pass before reaching the petticoat and smoke-stack.

All of the above parts are well known and in common use.

10 is the vertically-adjustable damper-plate for regulating the draft by raising or lowering the plate in the usual manner.

11 is the door in the front of the smoke-box through which access to the smoke-box is ob-

tained, and 12 is the clean-out opening at the usual place for removing the accumulation of cinders at the bottom of the smoke-box.

Rising from the bottom of the smoke-box under the deflecting-plate 8 is the transverse plate 13, and extending forward from the top of plate 13 and also downwardly to the clean-out opening 12 is the oblique plate 14, the function of which is to direct cinders falling thereon out of the smoke to the opening 12.

Extending from the bottom of the opening closed by the door 11 down to the clean-out opening 12 is the oblique partition 15, which prevents the lodgment of cinders in the lower front end of the smoke-box and directs them into the clean-out 12.

Depending from the clean-out opening 12 is the holder 16, in which the cinders are collected. The walls of this collector expand outwardly and downwardly to facilitate discharge, and the bottom walls of the collector are still more oblique to form a seat for the correspondingly-tapering bottom closure 17. The latter is hinged at 18 and has a spring 19, which normally closes the holder. The opening and discharge of the holder may occur automatically when the weight of cinders collected in the holder exceeds the tension of the spring, but preferably a cable 20<sup>a</sup>, connected with the bottom 17 and reaching to the cab of the engine, will be provided, so that the engineer may discharge the contents of the holder at will by pulling on the cable.

The more effectually to drive the cinders out of the lighter smoke as the mixture of the two passes the exhaust-nozzle I provide the pipe 20, through which steam from the dome 21 of the boiler is discharged toward the clean-out from a point adjacent to the lower end of the deflecting-plate. The amount of steam is regulated by the cock 22, which has a controlling-lever which is connected with the rod 23, which rod terminates at the cab within convenient reach of the engineer.

Leading from the bottom of the boiler is the water-pipe 24, which discharges upon the plate 14, preferably near the upper edge of the latter. The purpose of the water-discharge through pipe 24 is to wash the deposits of cinders on said plate down into the holder 16.



The water thus applied also extinguishes the fire in the red-hot cinder and dampens the mass, so that when a holderful is discharged by the opening of the bottom 17 the discharged  
 5 mass of cinders will be incapable of setting fire to anything along the roadway, and the inconvenience and damage resulting from dust arising from a discharge of dry ashes is prevented. The invention thus contributes to both com-  
 10 fort and safety.

The pipe 24 takes its supply of water preferably from the bottom of the boiler, for the reason that by so doing the accumulation of mud in the bottom of the boiler will be drained  
 15 off and the boiler kept cleaner than otherwise would occur. The pipe 24 has cock 25, the handle of which is operated from the engine-cab through the manipulation of the rod 26, running from the handle to the cab.

20 The damper-plate 10 is appropriately slotted for the passage of pipe 20 and the adjustment of the plate without conflict with said pipe.

Having thus fully described my invention, 25 what I claim as new, and wish to secure by Letters Patent, is—

1. A smoke-box for a portable boiler having a cinder-discharge opening through its bottom, inclined plates leading to said discharge, 30 a steam-jet to drive the cinders toward the discharge and means discharging upon said inclined plates for wetting the cinders before they are discharged.

2. A smoke-box for a portable boiler hav-

ing a receptacle for cinders and waste prod- 35 ucts of combustion under said smoke-box, a discharge-opening to said receptacle, means for opening and closing the receptacle, means for blowing the cinders toward the opening to the receptacle, and means discharging upon 40 the receptacle-approaches for wetting the cinders before they are discharged.

3. A smoke-box, a receptacle under the box, said box having open communication with the receptacle, means for discharging the recep- 45 tacle, inclines on the bottom of the smoke-box sloping toward the receptacle-opening, means for blowing cinders toward the receptacle-opening and means for discharging water upon one of the said inclines. 50

4. A smoke-box, a receptacle under the smoke-box having an upward taper and open communication through the bottom of the smoke-box, means for discharging the con- 55 tents of the receptacle, inclines on the bottom of the smoke-box leading toward the opening to the receptacle, means for discharging water upon one of the inclines, means for blowing the cinders toward the receptacle-opening and means for regulating the force of the blast 60 and the quantity of water-supply.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 7th day of May, A. D. 1903.

JOHN W. HEATON. [L. s.]

Witnesses:

S. MAHLON UNGER,  
 JOHN B. SHERWOOD.