No. 781,722. PATENTED FEB. 7, 1905.

J. W. HEATON.

SPARK ARRESTER, EXTINGUISHER, AND DISCHARGER.

APPLICATION FILED MAR. 2, 1904.

Fig. 1.

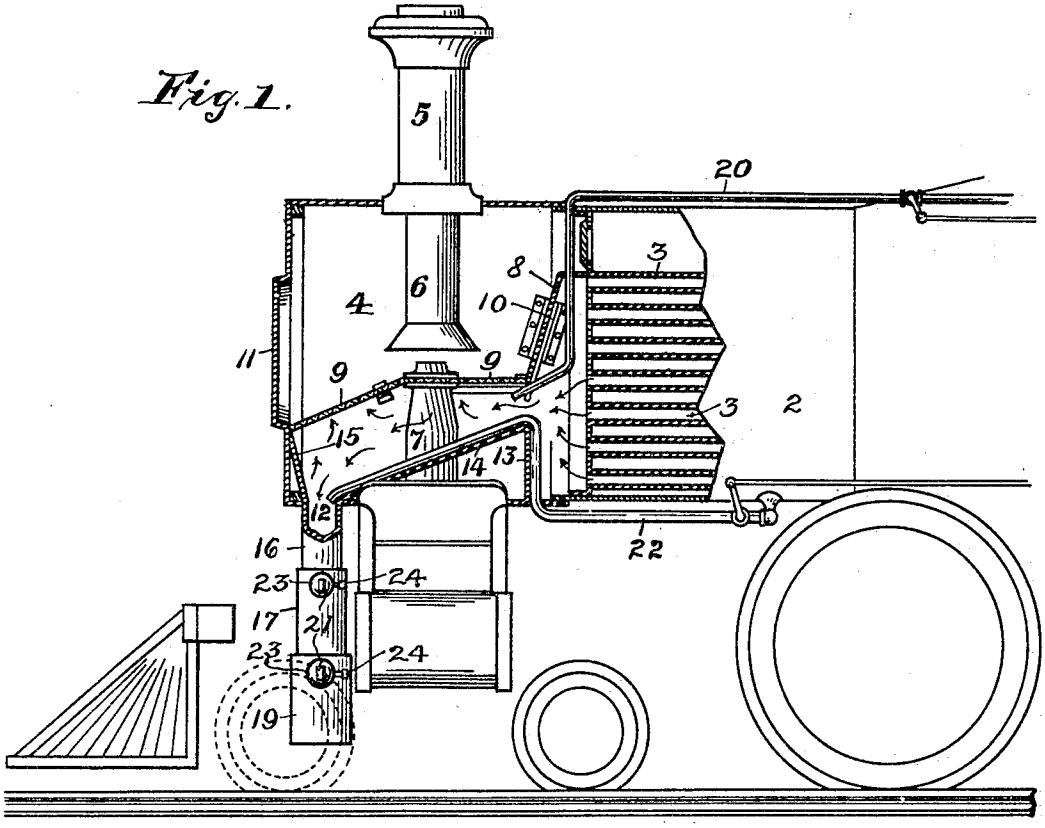
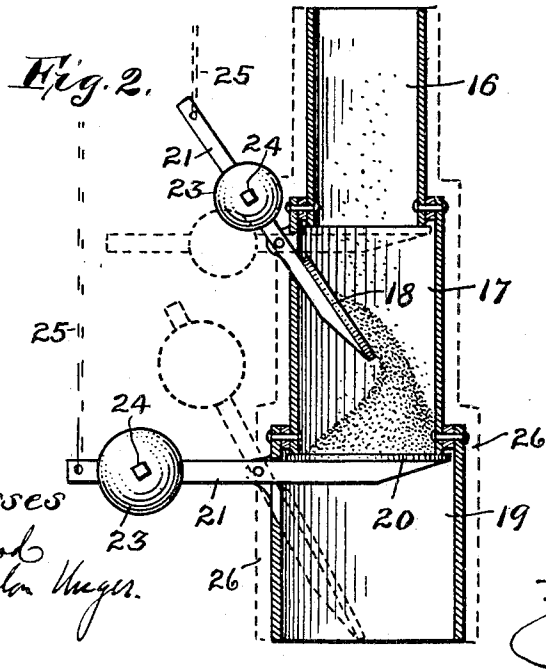


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN W. HEATON, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-FOURTH TO CHARLES DAUGHERTY AND WILLIAM F. WOCHER, OF INDIANAPOLIS, INDIANA.

SPARK ARRESTER, EXTINGUISHER, AND DISCHARGER.

SPECIFICATION forming part of Letters Patent No. 781,722, dated February 7, 1905.

Application filed March 2, 1904. Serial No. 196,214.

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.

This invention relates to improvements in spark-dischargers whereby dead sparks or sparks from which the fire and heat has been extinguished will be automatically discharged from the smoke-box as fast as a predetermined weight of them is accumulated; and the object of the invention is to make such discharge automatically without the admission of air to interfere with the draft.

The invention is illustrated in the accompanying drawings, in which like characters of reference indicate like parts throughout the several views, and in which—

Figure 1 represents the front end of a locomotive-boiler in vertical section with my invention applied, and Fig. 2 a detail in vertical section of the discharge-tube on a plane transverse to the longitudinal dimensions of the engine.

2 is the boiler having the tubes 3.

4 is the smoke-box, 5 the smoke-stack, and 6 the petticoat or clearance pipe which discharges 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 direct the smoke and cinders from the boiler-tubes downwardly, and 9 the wire-netting extending from the bottom of the deflecting-plate forward to the front of the smoke-box. It forms 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, 11 the door through which access to the smoke-box is obtained, and 12 the opening at the usual place for removing the accumulation of cinders from the smoke-box. The transverse plate 13 has the oblique plate 14 to direct the cinders toward the opening 12, and extending from the bottom of door 11 to the clean-out opening 12 is the oblique partition 15, which permits the lodgment of cinders in the lower front of the smoke-box and directs them into the clean-out 12. Compressed air through pipe 20 is discharged into the smoke coming from the tubes to drive the cinders out of the lighter discharge. This is controlled from the engine-cab. Water is discharged through pipe 22 into the opening 12 from the boiler to extinguish the fire in the hot cinders. The flow through the pipe is regulated by cock 23, having opening and closing means extending back within reach of the engineer.

Depending from the clean-out opening 12 is the tubular holder 16, in which the cinders are collected. Below this is the holder 17 of greater diameter, the offset between the two forming a shoulder-bearing against which the valve 18 makes a practically air-tight fit when closed. Below the holder-section 17 is the tubular extension 19 of greater diameter to form a shoulder against which the valve 20 has a bearing. Both valves are mounted on levers 21 21, which extend through walls of the holder and are pivoted to ear extensions from said walls. The outer ends of the levers have the sliding weights 23 with set-screws 24. The weights sustain an accumulation of cinders on the valves until a maximum is reached which overbalances the weight on the particular lever, whereupon the valve will be depressed and the load carried by it will be dumped. The position of the weight on its lever will determine weight of cinder accumulation possible before the valve is tipped and the dumping is effected. By having a compound-valve mechanism in which each valve is independently adjustable, so as to operate under different loads, and consequently at different times, one valve will be closed while the other is dumping, and the draft of the fire is not interfered with. By properly adjusting the weights the upper

valve, for example, can be set to dump three times to the lower one's once or at any other intervals within the compass of the levers, and the distance between the two valves may be great enough to allow the top valve to finish dumping and close before enough weight of cinders has reached the lower one to open it. In the latter case the two valves are opened by the same weight of cinders. Preferably this discharging mechanism will be operated automatically; but where it is desired to open the valves before the weight of cinders required to do that work has been collected they may be opened by means of a cable. (Shown in dotted lines at 25 in Fig. 2.) The cables may be connected with a plunger operated by compressed air, or they may be run back to the engine-cab and operated by the engineer.

In cold climates the freezing of the water, by which the cinders are wet and extinguished, is prevented in a large measure by covering the tubes with asbestos, as shown in dotted lines at 26 in Fig. 2.

Having thus fully described my invention, 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, a receptacle leading from said discharge, said receptacle being in compartments of abruptly-increasing diameters toward the bottom of the series forming valve-seats at the offsets and valves between said compartments forming temporary closures against said seats.

2. A smoke-box for a portable boiler having a cinder-discharge opening through its bottom, a receptacle leading from said discharge, said receptacle being in compartments formed from pipe-sections of increasing diameters secured to each other and forming offsets, valves between said compartments making seats on said offsets and forming closures and means for operating the valves alternately.

3. A smoke-box for a portable boiler having a cinder-discharge opening through its bottom and a receptacle made of pipe-sections each greater in diameter than the one above it, leading from said discharge provided with a plurality of valves each of which closes against the end of a pipe-section.

4. In a smoke-box for a portable boiler, a cinder arrester and extinguisher, and a tubular discharge from the bottom of the smoke-box having a plurality of valves each attached to a pivoted and weighted lever, said tubular discharge increasing in diameter downwardly from each valve-seat.

5. In a smoke-box for a portable boiler, a cinder arrester and extinguisher, a tubular discharge taking from the bottom of the smoke-box, a plurality of valves each attached to a pivoted lever and adjustable weights on said levers, said tubular discharge increasing in diameter downwardly from each valve-seat.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 17th day of February, A. D. 1904.

JOHN W. HEATON. [L. S.]

Witnesses:

S. MAHLEN MYER,

J. A. MINTURN.