(No Model.)

H. MILLHOLLAND.

SPARK ARRESTER.

No. 271,255. Patented Jan. 30, 1883.

Fig. 1.

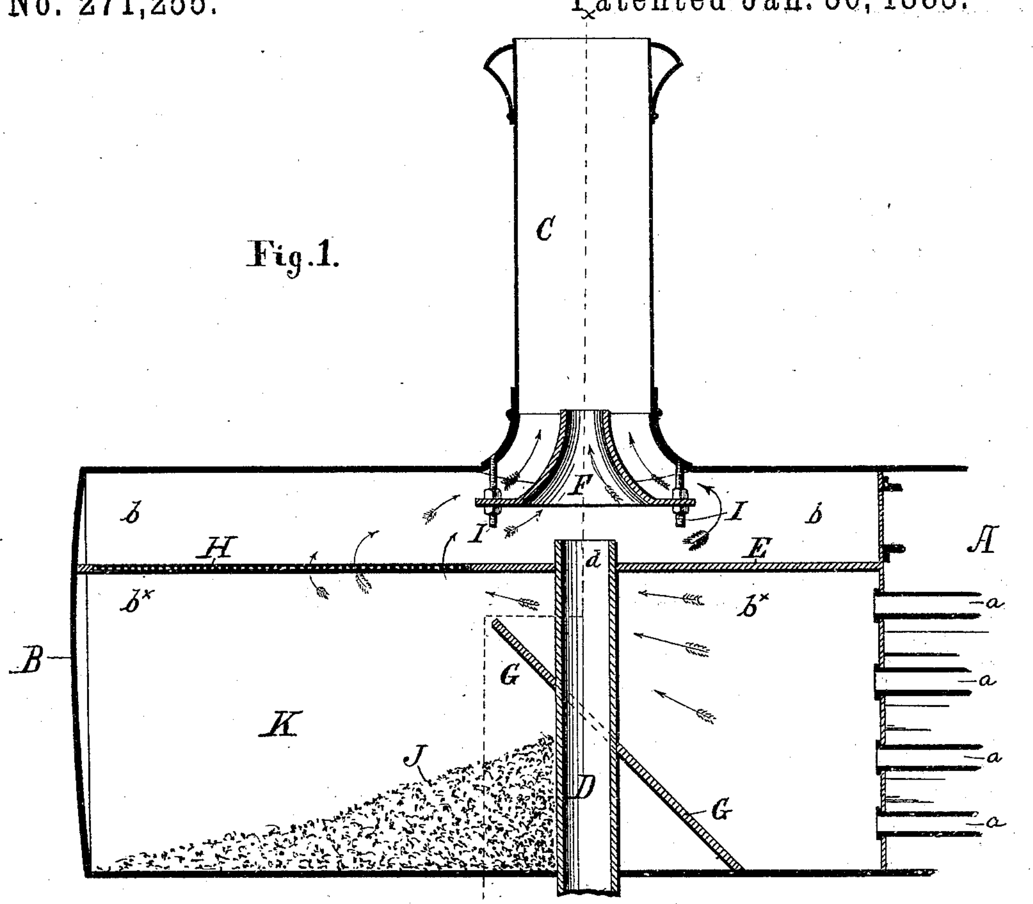
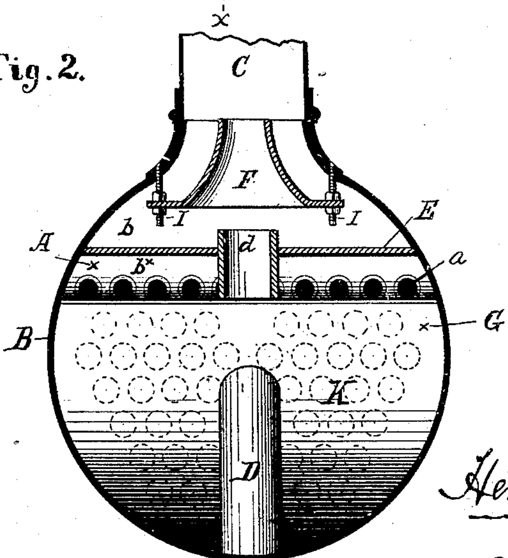


Fig. 2.



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HENRY MILLHOLLAND, OF PHILADELPHIA, PENNSYLVANIA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 271,255, dated January 30, 1883.

Application filed November 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY MILLHOLLAND, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Spark-Arresters for Locomotive-Engines, of which the following is a specification.

My invention relates to that large class of devices which are known as "spark-arresters;" and its object is the effectual retention of cinders and economy in the consumption of fuel.

In the accompanying drawings, Figure 1 represents in longitudinal vertical central sectional elevation an apparatus conveniently embodying my invention, and shown applied to a locomotive-engine, a portion only of which latter is represented. Fig. 2 is a transverse vertical sectional elevation of the same, taken on the dotted line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts.

In the accompanying drawings, A represents the extreme front portion of a locomotive-boiler, and *a* the flues therein, which communicate in the usual manner with the smoke-box B.

C is the smoke-stack, and D an exhaust-pipe leading from the steam-cylinders, the discharging extremity or nozzle *d* of which is centrally below the stack.

E is a solid diaphragm, extending in a horizontal plane across the smoke-box to a line slightly in advance of the exhaust-pipe, which passes through it, beyond which line it is in effect continued in the form of a horizontal screen or netting, H. The diaphragm and screen together divide the smoke-box horizontally into an upper and a lower compartment, which I have respectively designated by the letters *b* $b^{\times}$.

G is an inclined partition, sprung from the bottom of the lower compartment of the smoke-box upwardly and forwardly, conveniently at an angle of forty-five degrees, and terminated along its upper free edge close to but not in contact with the horizontal diaphragm, substantially as shown. The exhaust-pipe passes through this inclined partition also.

F is a blast-concentrator, which is preferably fashioned in the shape of a nozzle or inverted trumpet, and which is suspended in concentric vertical alignment over the discharging extremity of the exhaust-pipe, so as to receive the steam therefrom and discharge it centrally within the stack. It is suspended from the base of the stack or upper portion of the smoke-box by vertical adjusting-screws I or kindred devices, whereby its vertical set may be controlled and the proper relation between it and the orifice of the exhaust-pipe be established. If desired, it may be erected from the horizontal diaphragm instead of being suspended.

J represents an accumulation of cinders or sparks in that portion of the lower compartment of the smoke-box forward of the inclined partition which I have entitled the "cinder-chamber" and have designated by the letter K.

The above being a convenient embodiment of a preferred form of my invention, the operation of the device will be easily understood. The exhaust-steam escaping through and from the exhaust-pipe into the blast-concentrator occasions the formation of an ejecting-current. The blast-concentrator and exhaust-pipe together acting as an ejector create a vacuum in the immediate neighborhood of said blast-concentrator, into which and into the ejecting influence of the blast the smoke and gases are consequently drawn, in the manner and direction indicated by the arrows in the drawings. The cinders sucked through the flues *a* are deflected by the inclined partition against the screen, and are intercepted by the latter and gravitate into the cinder-chamber of the lower compartment of the smoke-box, where they are represented in the drawings as collected.

It will be readily understood that the steam-blast generated in the injector creates an artificial current, whereby the full opening of the exhaust-pipe is enabled to be maintained, back-pressure in the cylinder avoided, and a consequent saving of fuel effected. The cinders, moreover, when they have gravitated into the cinder-chamber are protected by the inclined partition from the current from the flues, which, were they subjected to it, would agitate and churn them constantly until by abrasion they would be rendered sufficiently small to pass through the mesh of the screen.

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

1. As an improvement in locomotive-engines, the combination, with a smoke-box with which

the boiler-flues communicate, of a diaphragm and netting which together divide the box into two compartments, an exhaust-steam pipe, a blast-concentrator operating in connection therewith, and an inclined partition, the whole constructed, arranged, and operating substantially as hereinbefore set forth.

2. The combination, with a smoke-box of a locomotive-engine, which is divided into two compartments by means of a solid horizontal diaphragm and a screen, being a continuation of the same, substantially as set forth, of an inclined partition, substantially as and for the purpose specified.

3. As an improvement in locomotive-engines, the combination, with a smoke-box through which an exhaust-steam pipe passes, of a stack in line to receive the discharge from said exhaust-pipe, a blast-concentrator constructed and operating substantially as described, and means for regulating the vertical set of the blast-concentrator with respect to the discharging-nozzle of the exhaust-pipe, substantially as and for the purposes specified.

In testimony whereof I have hereunto signed my name this 24th day of November, A. D. 1882.

HENRY MILLHOLLAND.

In presence of—

J. BONSALL TAYLOR,

W. C. STRAWBRIDGE.