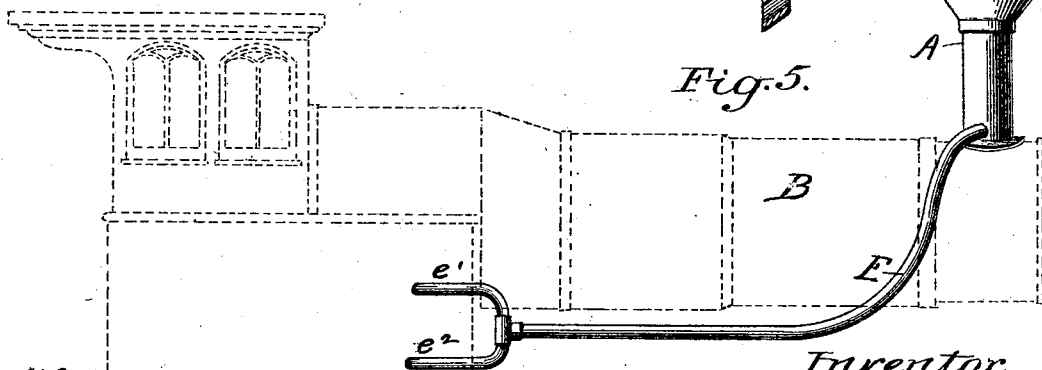
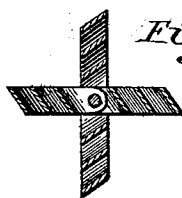
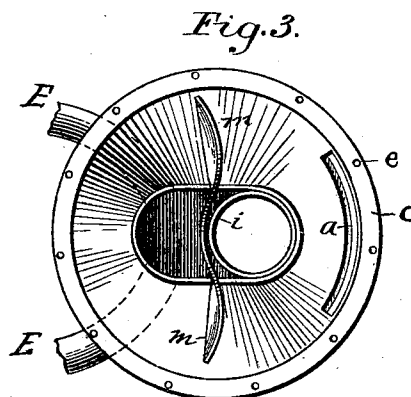
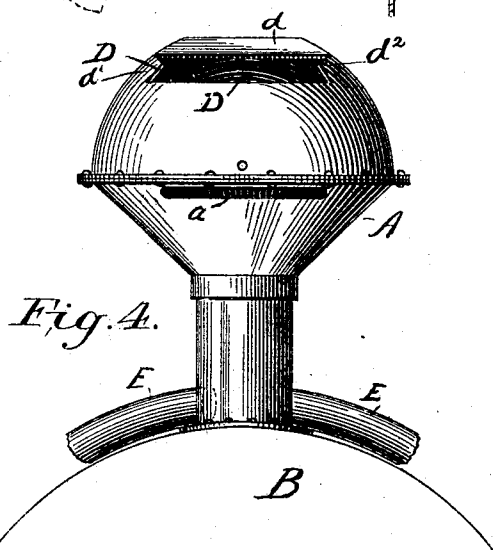
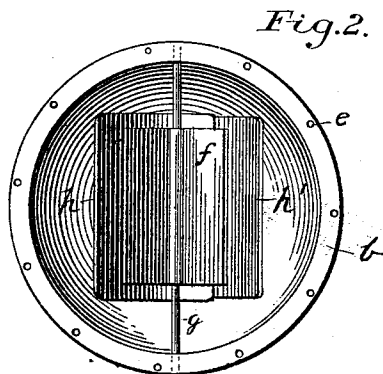
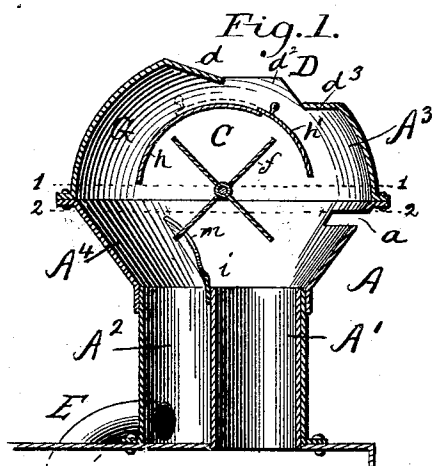


(No Model.)

E. R. JONES.
SMOKE AND SPARK ARRESTER.

No. 517,220.

Patented Mar. 27, 1894.



Witnesses:
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UNITED STATES PATENT OFFICE.

EDWARD R. JONES, OF BALTIMORE, MARYLAND.

SMOKE AND SPARK ARRESTER.

SPECIFICATION forming part of Letters Patent No. 517,220, dated March 27, 1894.

Application filed February 7, 1894. Serial No. 499,416. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. JONES, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Smoke and Spark Arresters, of which the following is a specification.

The principal object of my invention is to design a spark arrester and arrangement for returning the gases or unconsumed products of combustion back to the ash pan and fire box of a steam boiler furnace. While I have shown the invention in connection with a locomotive yet I do not wish to limit myself to such steam engine, as said device is applicable to any kind of furnace.

The invention consists mainly in a double smoke stack inclosed within a casing, although this casing is not essential. The top of this stack being enlarged and presenting what is commonly known as the "diamond stack." Arranged within this enlargement are the necessary ports to insure a return of the products of combustion.

Referring to the drawings Figure 1 is a sectional view of the stack showing double tubes inclosed within the casing. Fig. 2 is a view taken on line 1—1 Fig. 1. Fig. 3 is a view taken on line 2—2 Fig. 1. Fig. 4 is a front view showing peculiar opening in the top of the stack; and air slot. Fig. 5 is a view of the means for returning the products of combustion to the fire box and ash pit. Fig. 6 is a modification of the fan or blower.

The smoke stack referred to in a general way by reference letter A consists of a double stack or two tubes A' A² vertically arranged upon the boiler B. Immediately above the tubes A' A² the stack is flared by a conically shaped piece A⁴, and upon this piece A⁴ is placed an inverted cone shaped piece A³. These pieces are provided with flanges b c upon their wider or flaring edges, said flanges being perforated at e and riveted or otherwise secured thereby forming a chamber C in the upper end of the smoke stack.

Horizontally arranged within the chamber C upon the shaft g is a fan or blower f, arranged above the fan f is a curved housing h provided with a sliding projection h'.

Arranged below the fan and in the part A⁴ and at the front of the stack is an air slot a. Secured to the upper end of tube A' or A²

is a yoke shaped fender i provided at its extreme ends with paddle shaped enlargements m.

At the top of the stack is arranged a peculiar shaped opening D, arranged back of this opening and projecting forward of the stack and downward is a lip d, and arranged in the forward part of opening D and projecting rearwardly is a lip d³. On either side of said opening are two projecting lips or ears d' and d².

At the bottom of the stack and opening into tube A² are smoke and gas conveying pipes or conduits E, provided with branches e' and e² opening into the furnace and ash pan respectively.

The mode of operation is as follows: Fire being started in the furnace the products of combustion pass through the boiler flues in the usual way, and being assisted by the artificial draft caused by the exhaust in a locomotive boiler, pass out of tube A' with considerable force. If the slide h' be shoved back in the position shown in dotted lines Fig. 1, said products of combustion pass unobstructed out of the opening D in top of stack A. When the locomotive is in action, air is admitted in considerable force through slot a, this air and the force of the draft created by the exhaust cause the fan or blower f to revolve with great rapidity, and by reason of the leaves of the fan passing between the stationary yoke or paddle shaped extensions m and when the extension h' is in position shown in full lines in Fig. 1, the smoke, gases and cinders are caused to be drawn in under hood h and be forced down tube A² into conduits E and thence to ash pan and fire box. Any smoke and gases that may escape past the slide h', are by force of the suction created by the exhaust and fan and by action of air driven in through opening D, and will be driven through conduit G into tube A² and conduits E. The leaves of the fan or blower instead of being solid or blind as shown in Fig. 1, may be slotted or made with slots, as in Fig. 6, the angle or inclination of said slots being so arranged as to create a strong suction and thereby greatly facilitate the admittance of smoke, gases and cinders into the return pipe or tube A². The peculiar shaped opening D is designed to split the air as it

strikes lip *d* especially when the locomotive is in motion, and deflect the greater force away from the stack but at the same time allowing sufficient quantity to cause the escaped products of combustion to turn into passage or conduit *G*.

Having thus described my invention, what I desire to claim is—

1. In a smoke and spark arrester, a smoke-stack, two vertical parallel tubes forming the lower part thereof, and an enlargement at the upper end, a fan or blower arranged within said recess and adapted to intercept the path of the products of combustion, and an adjustable hood or curved plate arranged above and adapted to cover the upper part of said fan whereby when said plate is adjusted forward the smoke and gases are returned through conduit *E* to the ash-pit and fire box, and when adjusted rearward, an unobstructed passage is given said smoke and gases out of the top of the stack, substantially as described.

2. In a smoke and spark arrester an opening *D* at the top of the smoke stack, a lip *d* projecting inward and downward within said opening, a lip *d*³ projecting rearwardly within said opening, and ears or sides *d'* *d*² arranged on either side thereof, substantially as and for the purpose set forth.

3. In a smoke and spark arrester, the combination of a smoke-stack, two vertically arranged tubes forming the lower part thereof,

a diamond shaped compartment at the upper end thereof, a hood consisting of a curved plate *h* and a sliding plate *h'* arranged thereon, said hood arranged in said compartment, a fan or blower arranged below said hood and over the upper end of said vertically arranged tubes, an air slot *a* in the front of said compartment, and one or more conduits *E* and branches *e'* *e*² connecting the base of the smoke stack and the fire box and ash pan, whereby the products of combustion are deflected within the smoke stack and returned to the furnace and ash pan, substantially as described.

4. In a smoke and spark arrester a smoke-stack, two pipes or tubes arranged vertical and forming the lower part thereof, a fan or blower arranged within said stack and over said pipes, plates with parallel slots forming the leaves of said blower, an adjustable hood arranged over said blower, whereby when said hood is adjusted back an unobstructed passage is given the smoke and gases from the exhaust pipe, through the slots in the leaves of said blower and out at the top of said stack.

EDWARD R. JONES.

Witnesses:

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