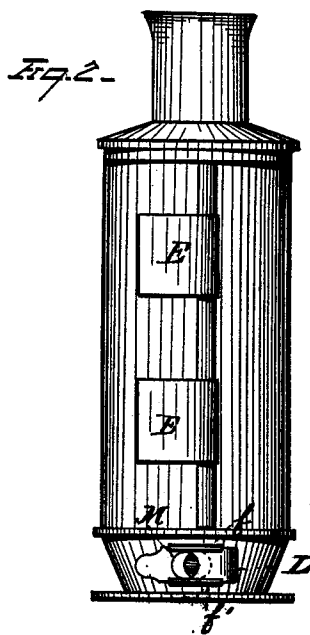
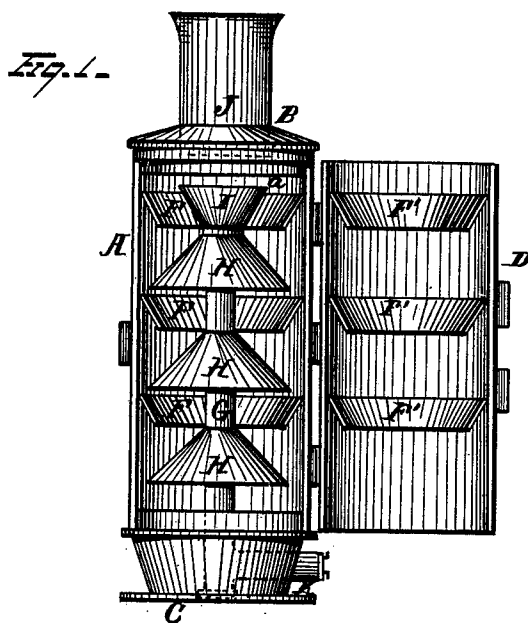


R. LISKOW.
SPARK-ARRESTER.

No. 176,435.

Patented April 25, 1876.



WITNESSES

E. J. Nottingham.

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By

INVENTOR

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UNITED STATES PATENT OFFICE.

ROBERT LISKOW, OF HOUSTON, TEXAS.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **176,435**, dated April 25, 1876; application filed March 25, 1876.

To all whom it may concern :

Be it known that I, ROBERT LISKOW, of Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Spark-Arresters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to certain improvements in spark-arresters; and it consists, first, in a smoke-stack formed in longitudinal sections, suitably hinged to each other, the interior of said sections being provided with depending deflectors, whereby ready access may be had to the interior of the stack for inspection or repairs.

Second, in the combination, with a sectional stack provided with annular deflectors, of conical deflectors arranged between the same, whereby unconsumed products of combustion are deflected in their upward passage and fall on the floor of the smoke-box.

Third, in the combination, with a central exhaust-pipe, of a series of conical deflectors attached thereto.

Fourth, in the combination, with the central exhaust-pipe, carrying a series of conical deflectors and terminating in a conical mouth at its upper end, of the top of the stack, formed with an exit-pipe depending from the interior of its contracted portion.

Fifth, in the combination, with the central exhaust-pipe, of a branch pipe, provided with a damper, the said pipe opening without the base of the stack for the admittance of air while the locomotive is at rest.

Sixth, in the combination, with the central exhaust-pipe, of a branch pipe, opening without the base of the stack, said opening being governed by a slide-valve having a circular opening, whereby the draft may be regulated as desired.

In the accompanying drawings, Figure 1 shows the stack with its hinged section thrown open; and Fig. 2 represents a rear elevation of the smoke-stack and the slide-valve for the admittance of air to the exhaust-pipe.

A is the stationary portion of the smoke-

stack, having top B and saddle C secured thereto by rivets, bolts, or in any other desired manner. D is the hinged portion of the stack, the same being attached to the section A by means of the hinge E, preferably of equal length with the main body of the smoke-stack. The free end of the hinged section D is provided with a hasp or any suitable fastening device, whereby it may be removably secured to the stationary section A.

To the inner surfaces of sections A and D, and at suitable distances apart, the depending deflectors F F' are secured, said deflectors forming, when the sections are locked, complete annular deflectors for the obstruction of the sparks in their upward passage from the fire-box. G is an exhaust-pipe centrally located in the stack or uptake A, and to said pipe the conical deflectors H are attached, preferably about midway between the annular deflectors F of the uptake A. The upper end of the exhaust-pipe G terminates in an inverted cone, I, between the upper edge of which and the lower edge of the depending exit-pipe J there is formed a passage-way, *a*, for the escape of smoke.

The lower end of the exhaust-pipe G connects with a branch pipe, K, leading without the base of the stack. Flanges *f f'* are attached to the upper and lower sides of pipe K, and serve as guides for the valve or damper L, which is formed with an opening, M, and said opening may be adjusted relatively to the opening in the pipe to admit any desired amount of air to the exhaust-pipe when the locomotive is at rest. The damper L is under the control of the fireman by a suitable connecting-rod leading to the cab of the engine.

The exhaust-nozzle of the engine is inserted in the lower end of the exhaust-pipe, and the exhaust steam draws the sparks from the smoke-box into the uptake, where the heavy and unconsumed products of combustion are deflected by the series of annular and conical deflectors, causing the sparks to fall into the smoke-box, from whence they are removed from time to time.

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

1. The combination, with the stationary section A, provided with deflectors F, of the hinged section D, having deflectors F attached thereto, substantially as and for the purpose specified.

2. The combination, with the sectional stack, provided with the annular deflectors F F', of the conical deflectors H, substantially as and for the purpose specified.

3. The combination, with the central exhaust-pipe G, of the series of conical deflectors H, arranged substantially as and for the purpose specified.

4. The combination, with the central exhaust-pipe G, carrying deflectors H, and provided with a funnel-shaped exit, I, of the depending exit-pipe J, whereby a space, a, is formed between the same for the passage of

smoke, substantially as and for the purpose specified.

5. The combination, with the central exhaust-pipe G, of a branch pipe, K, provided with a valve or damper, substantially as and for the purpose described.

6. The combination, with the central exhaust-pipe G and branch pipe K, of the sliding valve or damper L, substantially as and for the purpose set forth.

In testimony that I claim the foregoing, I have hereunto set my hand this 21st day of March, 1876.

ROBERT LISKOW.

Witnesses:

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H. ENGELKE.