A. DAVIS.

Spark-Arrester for Locomotives.

No. 209,665. Patented Nov. 5, 1878.

Fig. 2.

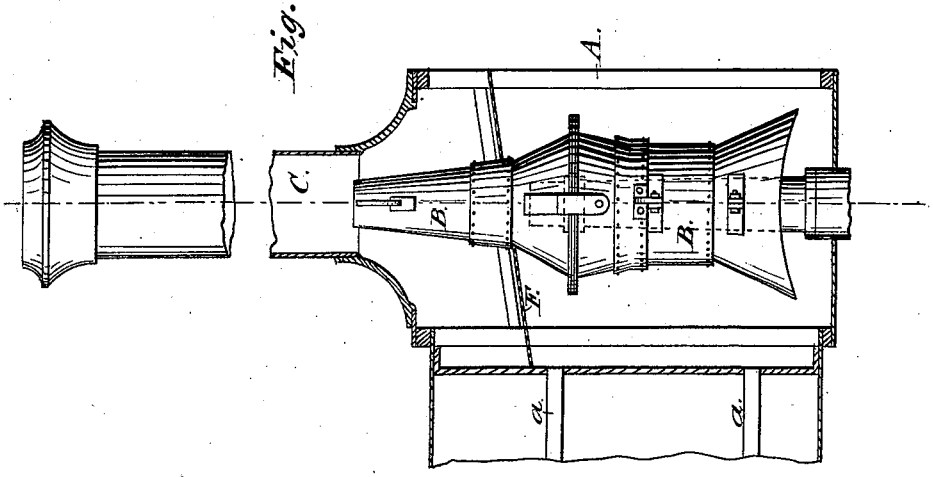


Fig. 3.

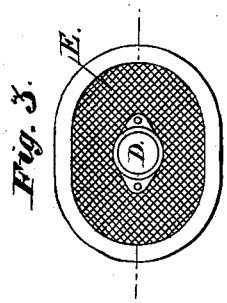


Fig. 1.

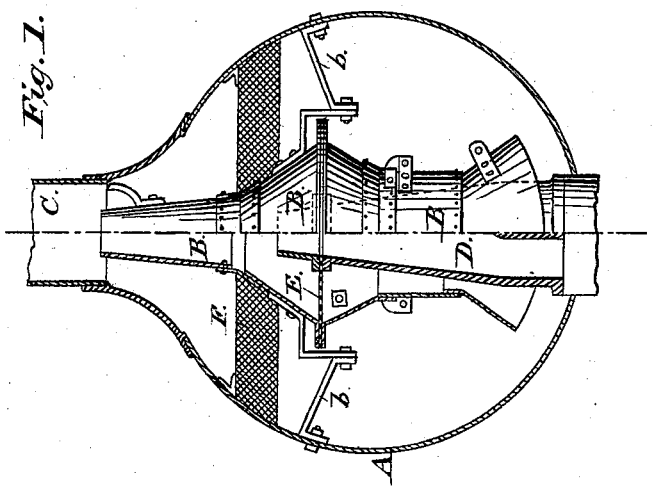
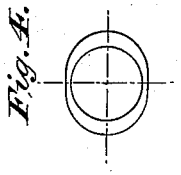


Fig. 4.



Witnesses:

James H. Lange.

Chas. E. Fraser.

Inventor:

Adolphus Davis

per Edson Bros.

Attorneys.

UNITED STATES PATENT OFFICE.

ADOLPHUS DAVIS, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY SHACKELL, OF SAME PLACE.

IMPROVEMENT IN SPARK-ARRESTERS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **209,665**, dated November 5, 1878; application filed October 12, 1878.

To all whom it may concern:

Be it known that I, ADOLPHUS DAVIS, mechanical engineer, of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Spark-Arresters for Locomotives, being combination exhaust, petticoat, and straight stack; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a front elevation, showing my invention contained in the smoke-box of a locomotive, partly in section. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a plan of the oval extension of petticoat-pipe, showing wire-netting diaphragm; and Fig. 4 is a plan of the connection of the upper portion of petticoat-pipe with oval extension.

Corresponding parts in the several figures are denoted by similar letters of reference.

This invention relates to certain improvements in spark-arresters for the stacks of locomotives, the object of which is to economize fuel and equalize draft, by which the heating of the tubes of the boiler is effected to the greatest advantage, the damaging of the fire-box plates prevented, the cylinders, valves, and pistons protected from coal-dust, ashes, or grit, and accidental fires along the line of the railroad from flying sparks avoided.

The first part of this invention consists in the arrangement in the smoke-box, in connection with an oval steam-exhaust pipe, of an upwardly-tapering oval petticoat-pipe, with its lower end extending down in proximity to the bottom of the smoke-box, where it is left open, and preferably of a bell-mouthed shape, and having an internal perforated diaphragm or partition; and the second part of this invention consists in the arrangement in the said smoke-box, in connection with the above-enumerated parts, of an outer perforated diaphragm or plate to intercept the immediate ascent of the sparks from the heating flues or pipes of the fire-box and deflect them downwardly, they falling upon the bottom of the smoke-box and being drawn up into the petticoat-pipe by suction, substantially as hereinafter more fully set forth.

In the annexed drawing, A is a smoke-box, such as is used in connection with the smoke-stack of a locomotive-engine, the smoke and sparks entering said box through the heating flues or pipes *a a*, extending from the fire-box through the boiler, but not so shown here. B is the upwardly-tapering oval petticoat-shaped pipe, which may be made in two or more sections, to permit of the displacement or removal of the lower or upper section when it is necessary to clean the smoke-box, &c.; or it may be made with suitable doors. It is hung in a rigid position in the smoke-box by the stiff hangers *b b*, with its upper end reaching up into the base of the smoke-stack C, where it may be braced in position by the braces *b′ b′*. The lower end of the pipe B extends down in proximity to the bottom of the smoke-box, and is preferably formed with a bell-mouthed shape, or made flaring, to aid in conducting the sparks thrown down on the bottom of the smoke-box up into the pipe B.

D is the oval steam-exhaust pipe, extending from the steam-chamber up into the petticoat or tapering pipe B a considerable distance, as seen in Figs. 1 and 2. E is a perforated diaphragm or plate, fastened across and in the pipe B at a point below the upper end of the exhaust-pipe D. F is a second perforated diaphragm or plate, fastened in an inclined position within the smoke-box A, to intercept the immediate ascent of the live sparks.

The operation is as follows: The sparks passing into the smoke-box will be intercepted in their upward tendency by the perforated diaphragm or plate F, and be deflected downwardly upon the bottom of the smoke-box. The steam being exhausted in the pipe B through the pipe D will create a vacuum in said pipe B. By the suction thus produced in pipe B the sparks will be drawn into said pipe, when they will be again intercepted and comminuted by the perforated diaphragm E, and at the same time be extinguished, thus preventing their leaving the stack C, out through which they are drawn in a live con-

dition. The tapering form of the pipe B increases the draft.

The above-enumerated results or advantages are readily seen from the foregoing.

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

1. In a spark-arrester, an oval exhaust-pipe and gradually-tapering oval petticoat-pipe, arranged substantially as specified.

2. In a spark-arrester, the combination, with an oval steam-exhaust pipe, of a surrounding or inclosing oval upwardly-tapering or petticoat pipe, open at its lower end and provided with an internal perforated diaphragm or plate, constructed and arranged substantially as and for the purpose set forth.

3. The combination, with a smoke-box and smoke-stack, of the oval exhaust-pipe, the oval petticoat-shaped pipe, having an inner perforated diaphragm, E, and the second or outer perforated diaphragm or plate, F, all arranged substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

A. DAVIS.

Witnesses:
C. C. McFALL,
C. C. McFALL, Jr.