H. H. Graham,

Spark Arrester,

No. 17,875. Patented July 28, 1857.

Fig. 2

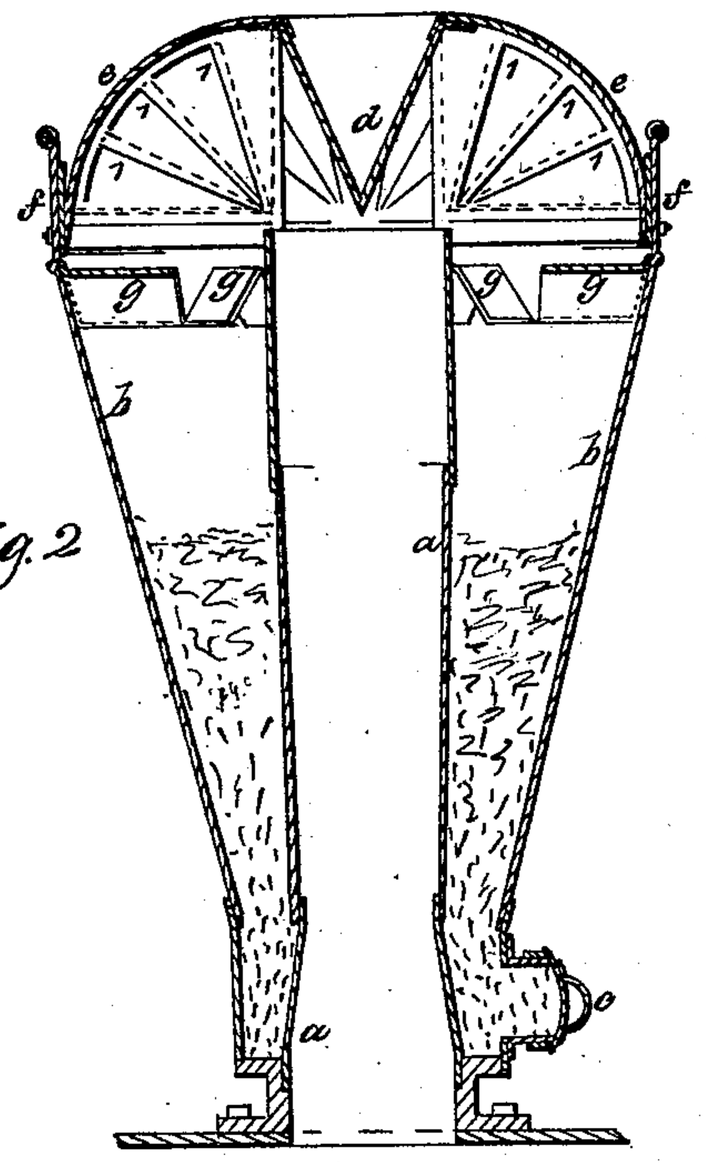
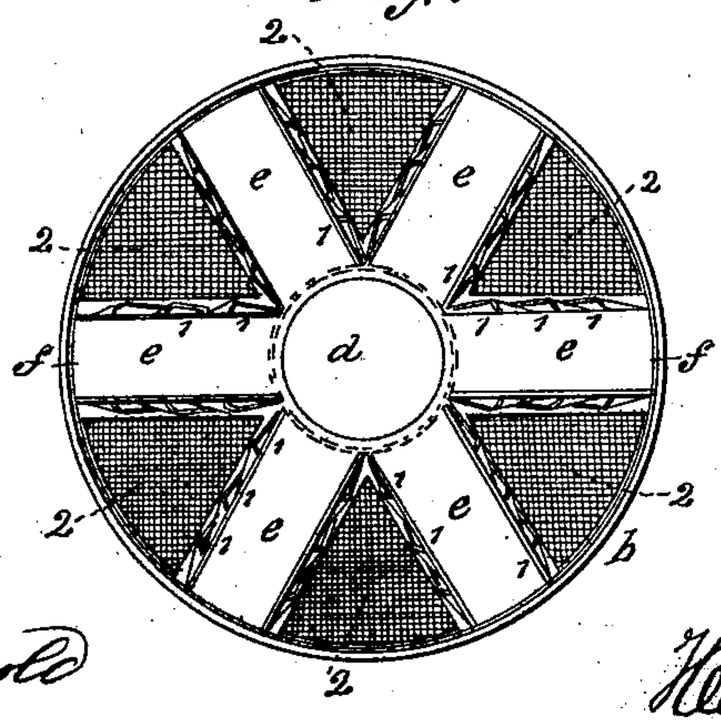


Fig. 1



Witnesses;
Samuel W. Lewis
Thomas G. Harold

Inventor;
Henry H. Graham

UNITED STATES PATENT OFFICE.

HENRY H. GRAHAM, OF PATERSON, NEW JERSEY.

SPARK-ARRESTER.

Specification of Letters Patent No. 17,875, dated July 28, 1857.

To all whom it may concern:

Be it known that I, HENRY H. GRAHAM, of Paterson, in the county of Passaic and State of New Jersey, have invented, made, and applied to use a new and useful Improvement in Spark-Arresters for Locomotives, which I term the "Star Spark-Arrester"; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1, is a plan of my said spark arrester, and Fig. 2, is a vertical section of the same.

Similar marks of reference denote corresponding parts.

Spark arresters have heretofore been formed with radial or star shaped conductors, passing outward and downward from a cone or deflector. My invention therefore does not consist in radial conductors, but in all other spark arresters with which I am acquainted the vertical sides of said conductors, near the center cone or deflector and above the top of the smoke pipe, are formed solid and the smoke has to descend and finally pass to a greater or less extent through screens or sieves. In these cases difficulty is experienced when the locomotive is being "fired up" before starting, or when stopping at stations, because the vapor passing off from the wood gums up and accumulates on the screens obstructing the draft which of course should be the most free and unobstructed when there is no steam to accelerate it. I therefore make use of slats or openings in the vertical sides of my star shaped conductors above the upper end of the smoke pipe and above the screens, formed in such a manner that almost if not all the smoke and other products of combustion pass out at said slats or openings when the engine is stationary; but I place said slats with their mouths opening toward the angle formed between two of said radial conductors, so that the draft when suddenly accelerated by the rush of steam, moving in the opposite direction to said slats, causes a momentary suction into the smoke-stack and prevents, entirely, any sparks passing out of the said slats, causing said sparks to fall into the outer casing while the smoke and steam and other products of combustion ascend through horizontal screens located between the bases of said radial conductors, and through the slats when the current is not greatly accelerated by the rush of steam. At the same time the position of the aforesaid slats is such that no current of air, when the engine is either stationary or in motion, can blow into said mouths to obstruct the draft.

In the drawing *a*, is the smoke pipe; *b*, the casing for receiving the sparks; *c*, is the orifice for the discharge of sparks—all in any usual manner.

d, is a conical deflector over the pipe *a*, to which the radial curved spark conductors *e*, are connected as shown, passing in the form of a closed plate from the base of the cone to the ring *f* of the casing *b*. The vertical sides of said spark conductors are formed with the slats 1, 1, the mouths of which open toward the angle between the two conductors, see Fig. 1, so that the sparks as they are deflected by the cone *d*, through said conductors *e*, travel in the opposite direction to said mouths or openings and therefore can not escape, but are thrown against the deflectors *g*, placed a little distance below the said spark conductors on which said sparks are slightly checked in their motion, so that they scatter and fall into the outer casing *b*, while the smoke gases, &c., pass up through the aforesaid slats 1, 1, and also through the screens 2, 2, that are placed in the triangular openings between the spark deflectors.

The wind can not blow into my spark arrester to do the same any injury, because the mouths of the slats 1, 1, opening toward the angle between the spark conductors do not allow the wind to enter the same in any direction, and the wind or current of air passing over said spark conductors produces a suction or minus pressure on the other side of the spark arrester which accelerates the draft.

In damp and foggy weather there is great difficulty in keeping up sufficient draft to make the heat and steam required for running at the usual speed and making time; this is a source of considerable inconvenience and is attendant with risk and danger. This trouble I have found mainly dependent upon the clogging of the screens and not affording sufficient space for the escape of the steam smoke, &c. In my plan this difficulty is entirely and practically obviated by the use of the slats and spark conductors as specified.

I do not claim radial spark conductors, screens or slats in themselves, nor their use in smoke pipes and spark arresters; but

What I claim, and desire to secure by Letters Patent, is—

Placing the slats 1, 1, in the vertical sides of the radial spark conductors *e*, at a higher elevation than the screens connecting the bases of said conductors, and with the mouths between said slats opening toward the angle between said spark conductors and in the opposite direction to the accelerated motion of the products of combustion, substantially as and for the purposes specified.

In witness whereof I have hereunto set my signature this twelfth day of May, 1857.

HENRY H. GRAHAM.

Witnesses:

LEMUEL W. SERRELL,

THOMAS G. HAROLD.