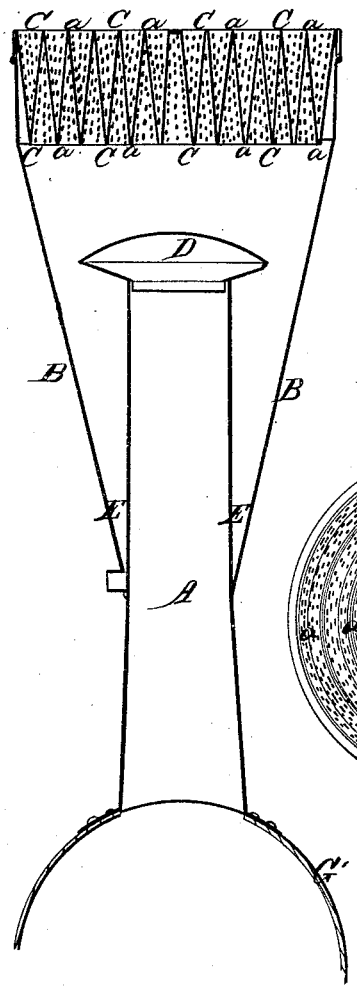
R. French,

Spark Arrester,

No. 2,131. Patented June 16, 1841.

Fig. 1.



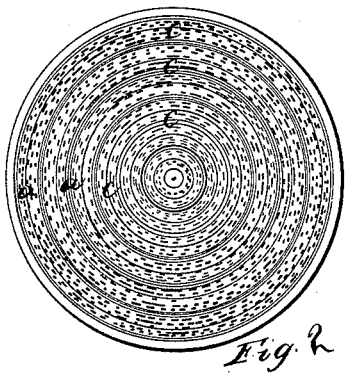


Fig. 2.

UNITED STATES PATENT OFFICE.

RICHARD FRENCH, OF PHILADELPHIA COUNTY, PENNSYLVANIA.

MANNER OF CONSTRUCTING SPARK-ARRESTERS.

Specification of Letters Patent No. 2,131, dated June 16, 1841.

To all whom it may concern:

Be it known that I, RICHARD FRENCH, of the county of Philadelphia, in the State of Pennsylvania, engineer, have invented an improvement in the manner of constructing a spark-arrester or instrument for preventing the escape of sparks from the chimneys of locomotive or other steam-engines; and I do hereby declare that the following is a full and exact description thereof.

To arrest the sparks, I employ either wire gauze, or perforated sheet metal, as the same is employed in other spark arresters; but to the part composed of such wire-guaze, or perforated sheet metal, I give a form by which I am enabled to increase its surface to any desired extent, without enlarging the diameter of the upper part of the arrester beyond the dimensions given thereto in instruments now in use, and in which the aggregate of the openings through the perforated metal, or the meshes of the wire-gauze, is not sufficient to admit a free and unobstructed pasage to the draft.

In the accompanying drawing, which is made to a scale one sixteenth of the size of the actual instrument, Figure 1, is a vertical section through the axis of my spark arrester, and Fig. 2, a top view of the same, showing the concentric circles formed by the junction of the respective hoops, or bands, of perforated metal, or wire-gauze.

A, is the ordinary chimney, or pipe, for the escape of smoke &c., and through which the escape steam is allowed to pass in the usual way, to create the necessary draft.

B, B, is a case, surrounding the chimney, and sustaining at its upper end the system of combined hoops, or bands, of perforated metal, or wire-gauze, for arresting the sparks. C, C, C, are these hoops, or bands, each of which is best made in the form of the frustrum of a cone of such dimensions as that when placed one within the other they may be united at their edges, as shown at *a*, *a*, *a*, and thus form a continuous, perforated surface, extending across the upper opening of the arrester, which in one of ordinary size may contain sixty feet, or more, of such perforated surface. The sparks and ashes which fall down between the chimney and the outer case may be removed at any time through an opening furnished with a shutter for that purpose, or may be conducted down through a tube leading into the ash pit, or other receptacle, as may be preferred.

Fig. 2 is a top view of the arrester, showing the circles *a*, *a*, formed by the joinings of the upper edges of the respective hoops, or bands *c*, *c*. It will be manifest that instead of making my arrester and the contained perforated apparatus circular, they may be made square, or polygonal, while in all other respects it would be identical in its structure and operation with that described. The hoops may also be in part cylindrical, and, in part, frustrums of cones.

To prevent the direct action of the draft on the perforated metal, or wire-gauze, I place a disk, or cap, of sheet metal D, Fig. 1, at a sufficient distance above the upper edge of the smoke pipe to allow the draft to escape laterally between them, which will cause the larger number of the sparks to fall down into the space E, to be disposed of, as before noticed.

G, is a portion of the smoke box, upon which the chimney is affixed.

I have shown my spark arrester as left entirely open, at top; but, if preferred, it may be surmounted by a cap, or hood, to defend it from rain and snow, sufficient space being allowed for the free escape of the draft. I do not, however, deem such provision necessary, as the heat, when the engine is in action, will convert what rain, or snow, may fall, into vapor as rapidly as it descends. The nearest approach to this plan of arranging the perforated sheet metal, or wire-gauze, which has been hitherto adopted has been in the spark arrester patented by Mr. Raeney, in which a number of separate, inverted, perforated cones are affixed to a cap plate; the difference between the two plans will be readily seen, as the extent of perforated surface admitted by the latter is limited within narrow bounds, while in mine it can be increased almost indefinitely.

Having thus, fully described the nature of my invention, and explained the operation thereof, what I claim therein, and desire to secure by Letters Patent, is—

1. The manner herein described of arranging and combining the hoops, or bands, of perforated sheet metal, or of wire-gauze, by uniting them at their upper and lower edges alternately, so as to produce continuous perforated surfaces of great extent, between

which surfaces concentric circular spaces are left, when the instrument is made circular, as is usually done.

2. I also claim the combining with the foregoing apparatus of perforated hoops, bands, or plates, a disk or cap as shown at D, interposed between the top of the chimney and said system of perforated hoops, or bands, for the purpose herein set forth and made known.

RICHD. FRENCH. [L. S.]

Witnesses:
IRA G. KATMOUGH,
ROBERT W. NORTON.