(Model.)

S. L. FRENCH & R. B. MELLON.

SPARK ARRESTER.

No. 265,055. Patented Sept. 26, 1882.

Fig. 1.

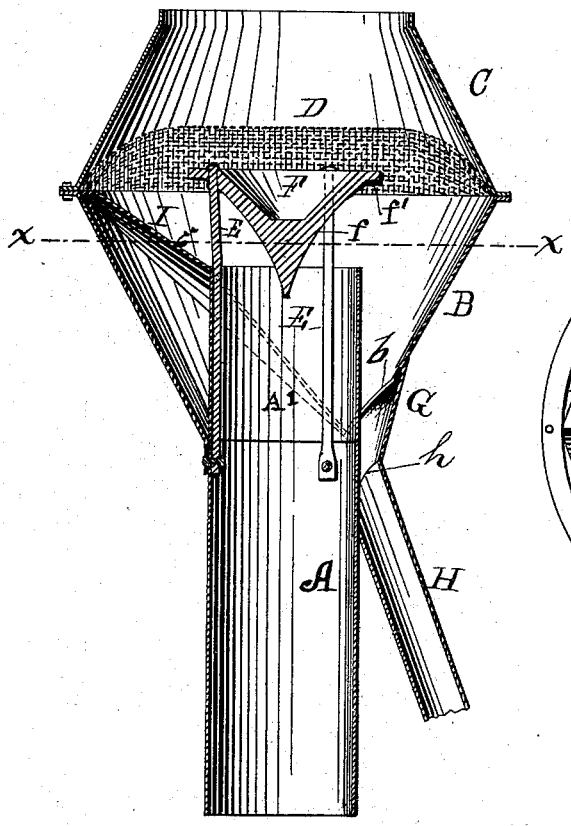


Fig. 2.

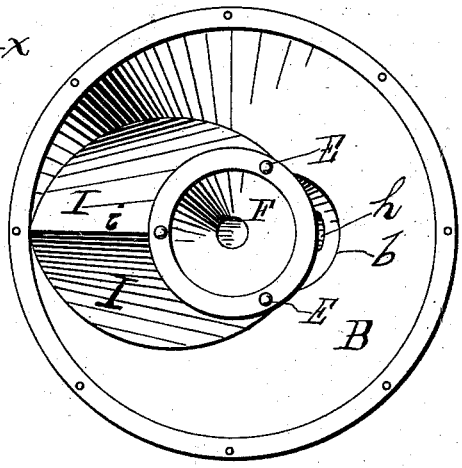


Fig. 3.

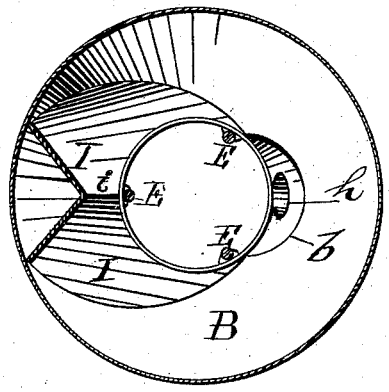
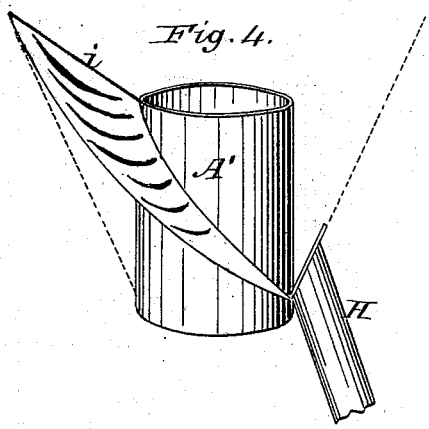


Fig. 4.



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By
Atty

UNITED STATES PATENT OFFICE.

SAMUEL L. FRENCH AND RICHARD B. MELLON, OF LIGONIER, PA.

SPARK-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 265,055, dated September 26, 1882.

Application filed January 31, 1882. (Model.)

To all whom it may concern:

Be it known that we, SAMUEL L. FRENCH and RICHARD B. MELLON, citizens of the United States of America, residing at Ligonier, in the county of Westmoreland and State of Pennsylvania, have invented certain new and useful Improvements in Spark-Arresters; and we 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Our present invention is an improvement on that for which Letters Patent No. 245,621, dated August 16, 1880, were granted to us; and it consists in a certain arrangement and construction of the several elements, as hereinafter fully described, and specifically set forth in the claims.

Figure 1 is a central vertical section of a locomotive smoke-stack constructed after our invention. Fig. 2 is a plan of the same with the top removed. Fig. 3 is a transverse section on the line *x x* of Fig. 1 with the deflector removed, and Fig. 4 a perspective of incline and sleeve detached.

Like letters of reference indicate like parts in all the figures.

A represents the body portion of an ordinary smoke stack; B, the lower section, and C the upper section, of its swell, and D the usual wire screen secured therein.

To the stack A are secured uprights E—in this instance three in number—provided for the support of the deflector F, which in form is an inverted cone having sides *f* continuously curved from base to apex, and a flange, *f'*, extending from the base at a right angle to the vertical axis of the cone to a distance beyond the diameter of the stack A, over which the deflector is centrally supported.

Within the lower section, B, of the swell of the stack is located about the uprights E a sleeve, A', of a diameter at its base equaling that of the body of the stack, and in height about one-third less than that of said section B.

To the sleeve A' and to the section B is suitably attached a double incline, I, the ridge or division line *i* of which extends upwardly from the upper end of the sleeve A' to the upper end of said section, and the two inclined sides thereof extend from said ridge downwardly and around the sleeve to the discharge-opening *b* in the lower and opposite side of the said section B. The upward extension of the incline I, as shown, provides a rigid bracing of the sleeve A', and presents a slanted surface, against which the cinders emitted toward it strike, and they are immediately directed downward.

A plate, G, is secured externally to the lower section, B, and to the body of the stack, said plate being perforated at *h*, where the pipe H is secured to the plate. The plate G may be, if desired, omitted, and pipe H may be secured to the sleeve A', as shown in Fig. 4, whereby the inclines I, sleeve, and pipe, or the incline and sleeve alone, may be constructed together to be inserted in any ordinary stack, or each may be constructed and inserted separately. In said Fig. 4 the dotted lines show the relative location of the lower section, B, and a flange is shown upon the pipe H to rest upon the inner surface of the section and serve as a means of attachment thereto by bolts or rivets.

The operation of our invention is as follows: The products of combustion carried by the draft are conducted up the stack A through the sleeve A', and impinge against the curved sides of the deflector, and are directed transversely against the sides of the section B and the screen D. The portions of said products which are not immediately projected laterally ride up the sides of the deflector until they are suddenly arrested by the flange *f'*, and fall with the rest upon the inclines I I, the construction and arrangement of which separates the whole body of cinders into two distinct portions, and presents a continuously-inclined surface laterally and vertically for the guidance thereof to the exit or discharge opening *b*, from whence the same is conducted through aperture *h* and pipe H into any convenient receptacle, such as shown in the patent hereinbefore mentioned.

It will be readily observed that at no time after striking the deflector do the cinders meet within the stack any surface which can possi-

bly support the same in a state of rest, so that accumulation of cinders therein is avoided, and while the deflector is of such contour as to offer the least possible resistance to the draft and smoke, it properly and fully directs the heavier particles of the products of combustion against the section B, thus reducing the wear of the screen; and, furthermore, the sides of the cone-shaped deflector, being smooth and not corrugated spirally or in steps, offer no resistance to the upward passage of the cinders, whereby none are driven back into the stack to accumulate at the bottom thereof.

The double incline I may be formed with a depressed groove in each of its wings, which will constitute an encircling trough about the sleeve, in and down which the cinders will be conducted.

We are aware that inverted cones having ribbed or spirally-fluted sides to deflect the cinders with a whirling motion or in curved lines are not new, and do not claim such as of our invention. In a perfectly-plain cone no resistance is offered to the escape of the cinders, and a less forcible draft is required to direct them outside of the area of the main flue of the stack, while the extension of its flange at a right angle permits a deflection of the cinders without such a stoppage thereof as would occur if the flange were turned in a downward direction. By our construction and arrangement of the parts nothing is located within the area of the main flue to conduct the cinders from the stack. By our construction and location of the parts the cinders are at no time suddenly diverted from their course. They first strike the curved smooth sides of the deflector, which gradually and with slight resistance change their direction, and are directed downwardly, not until they have passed beyond the area of the stack and sleeve, and hence none are so suddenly checked as to rebound into the stack.

Having described our invention and its operation, what we claim, and desire to secure by Letters Patent, is—

1. In a spark-arrester, the inclines I I, arranged and constructed to form a ridge-line, *i*, extending downwardly from the upper end of the section B to the upper end of sleeve A′, and continuously-inclined surfaces upon each side and around said sleeve to the lower opposite side of said section, substantially as shown and described.

2. The combination of the section B, sleeve A′, and inclines I I, forming the ridge-line *i*, inclined above the upper end of the sleeve, as shown, with the stack A, supports E, and the deflector F, having continuously-curved smooth sides *f* and flange *f′* extending at right angles, substantially as shown and described.

3. The combination of the stack A, section B, of a diameter at its base equaling that of the stack, double inclines I, screen D, and discharge-pipe H, with a deflector having continuously-curved smooth sides *f* and base-flange *f′* extending at right angles, substantially as shown and described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

SAMUEL L. FRENCH.
RICHARD B. MELLON.

Witnesses:
GEO. SENFT,
F. W. KAHN.