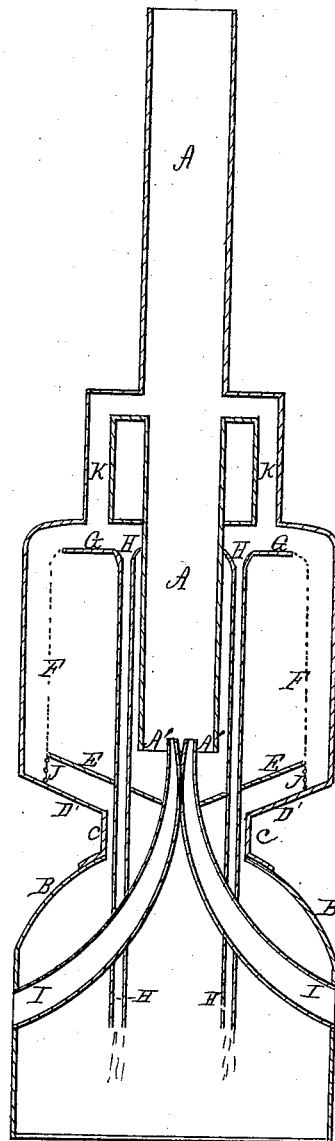


L. Phleger,
Spark Arrester,
Patented Nov. 25, 1839.

No. 1,417.

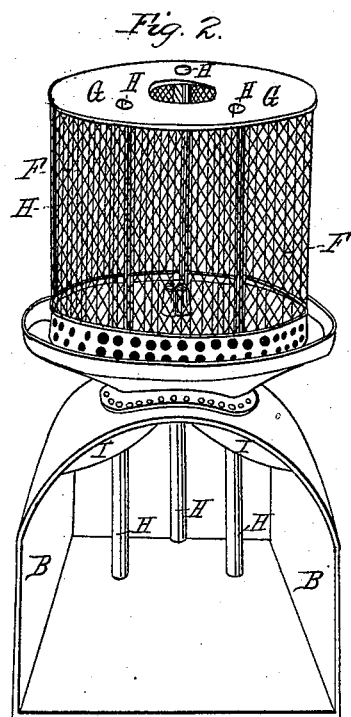
Sheet 1-2 Sheets.

Fig. 1.



Sheet 2 of 2 Sheets,
L. Phleger,
Spark Arrester,
No. 1,417,

Patented Nov. 25, 1839.



UNITED STATES PATENT OFFICE.

LEONARD PHLEGER, OF PHILADELPHIA, PENNSYLVANIA.

SPARK-ARRESTER.

Specification of Letters Patent No. 1,417, dated November 25, 1839.

To all whom it may concern:

Be it known that I, LEONARD PHLEGER, of the city of Philadelphia, in the State of Pennsylvania, engineer, have invented an improvement in the manner of constructing the apparatus denominated a "spark-arrester," to be used for preventing the escape of sparks from the chimneys of locomotive and other steam-engines; and I do hereby declare that the following is a full and exact description thereof.

The accompanying drawing is a vertical section, Figure 1, through the center of the chimney, or smoke flue; through a drum and its appurtenances by which the lower end of the smoke flue is surrounded, and through a part of the smoke box upon which the drum and chimney are sustained.

A, A, is the chimney and B, B, the upper part of the smoke box of a locomotive steam-engine. The lower end of the chimney does not open into the smoke box, but into a drum which is situated immediately above it.

C, C, is a short pipe or collar, inclosing an opening leading from the smoke box into the drum D, D, which drum incloses the lower portion of the chimney, the two being firmly united together at the upper part of the drum, by which the chimney is supported. The lower end A' A' of said chimney is not connected with the drum, or with the smoke box, but terminates three or four inches above the plate E, E, the use of which will presently appear.

Fig. 2 is a perspective view of a part of the interior of the apparatus, the same letters of reference designating the same parts as in the section.

Within the drum, and at the distance of three or four inches from it, there is a cage F, F, of wire-gauze, or of perforated sheet metal; the lower edge of which rests upon a metallic plate E, E, its upper edge being attached to a metallic plate G, G. Through this wire-gauze or perforated metal, the draft passes in its way from the smoke box into the chimney, its course being through the short flue C into the space between the lower plate D', of the drum, and the plate E, which supports the wire cage, thence, it passes through the meshes of the wire work to the chimney, which it enters at A', A', in the space between it and the plate E. The large surface of the cage allows of ample

space for the unobstructed passage of the draft; and the sparks are, consequently, not urged against it with the degree of force to which they are subjected in a more confined passage.

To prevent the passing of the larger pieces of ignited matter into the space between the drum and the cage, I, usually, place a band, or hoop, of sheet metal, at I, I, about six inches wide, extending from the plate E, to the bottom of the drum; through this plate I make numerous holes of about one fourth of an inch in diameter, leaving no more solid metal than will suffice to preserve its continuity. Instead of sheet metal, a coarse wire grating may be employed for the same purpose.

A large portion of the sparks will ascend on the outside of the cage, and will lodge on its top plate G; from this top plate, I pass tubes H, H, which descend through the drum, into the smoke box; and through these tubes the sparks, or ashes, will be drawn down, and lodge on the bottom of the smoke box, whence they may be removed at pleasure. The waste steam is projected into the chimney, in the usual manner, through the tubes I, I, there being perforations in the plate E E, through which they pass. When the engine is not in action, a direct passage for the draft exists through the pipes K, K, which lead from the space between the drum and the cage, into the chimney, for that purpose. These pipes I have made seven inches in diameter; they may be furnished with valves, if preferred, but these have not been found to be necessary in practice, as when the engine is in action, and the waste steam is projected into the chimney, there is not any tendency in the sparks to pass up through these pipes, as has been fully proved.

Having thus fully described the construction and operation of my spark-arrester, what I claim therein as of my invention, and desire to secure by Letters Patent, is

1. The surrounding of the lower part of the chimney with a drum which incloses a cage of wire, or of perforated metal, constructed and combined as herein made fully known, and between which drum and cage the draft from the smoke box passes, and thence through the meshes of said cage into the chimney, the lower end of which ter-

minates above the bottom plate of the cage, for that purpose.

2. I claim, also, in combination with the foregoing arrangement of the respective parts
5 of the drum and cage, the employment of the pipes K, K, for the passage of the draft when the engine is not in action, and also,

the tubes H, H, leading from the top of the cage into the smoke box, in the manner, and for the purposes, herein described.

L. PHLEGER.

Witnesses:

J. WILSON WALLACE,
AUBREY H. SMITH.