2 Sheets—Sheet 1

A. ELLIOTT.
Spark-Arrester.

No. 202,424. Patented April 16, 1878.

Fig. 1.

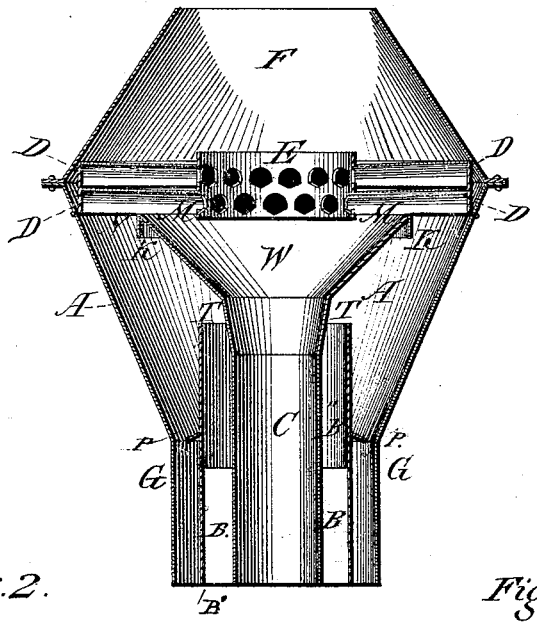


Fig. 2.

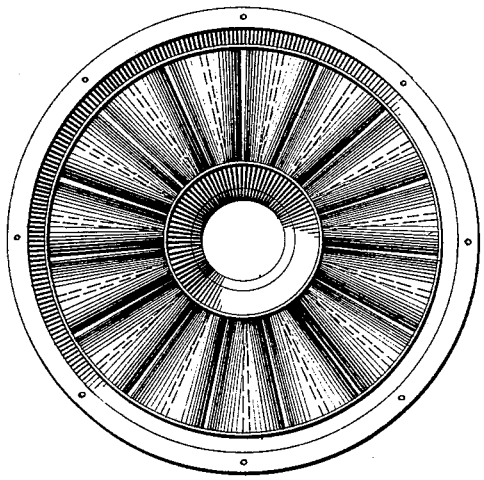
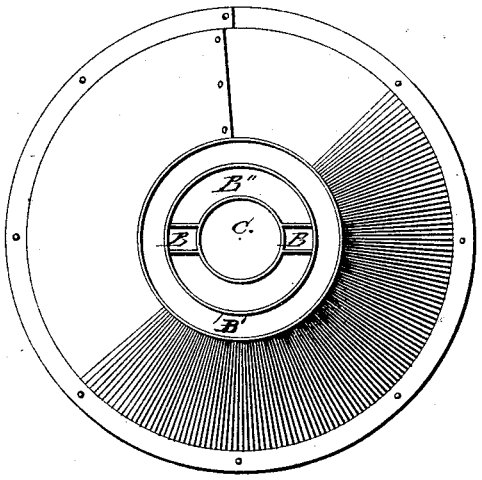


Fig. 3.



Attest:

G. C. Land
Wm. C. Crissey

Inventor.

Austin Elliott

2 Sheets—Sheet 2

A. ELLIOTT.
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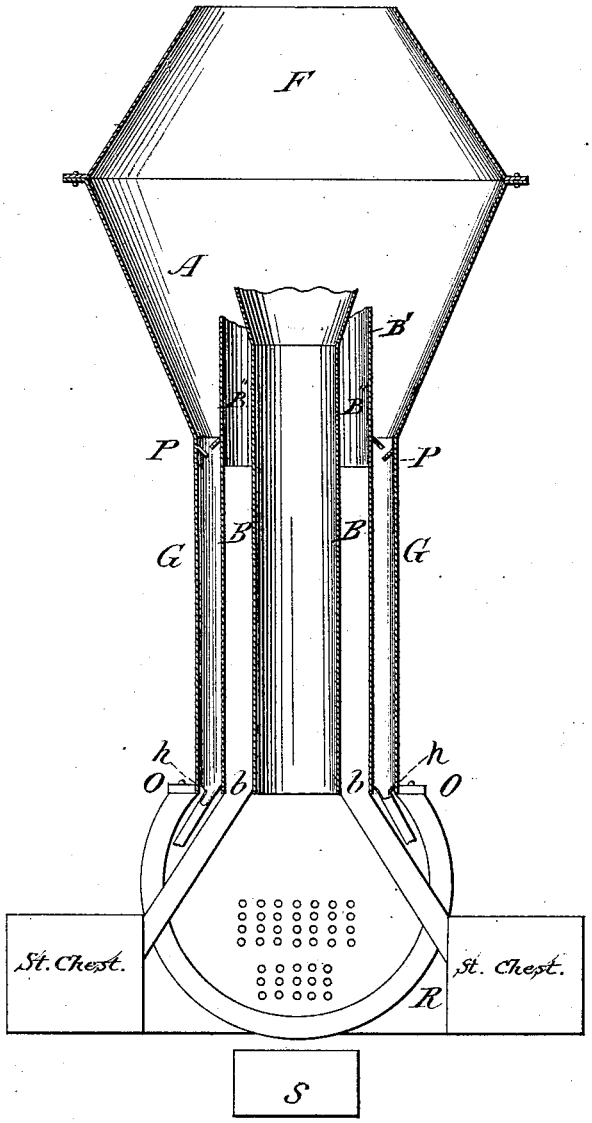
No. 202,424. **Patented April 16, 1878.**

Fig. 4.



Attest:
G. C. Land
Wm. E. Crissey

Inventor.
Austin Elliott

UNITED STATES PATENT OFFICE.

AUSTIN ELLIOTT, OF WARRENSBURG, MISSOURI.

IMPROVEMENT IN SPARK-ARRESTERS.

Specification forming part of Letters Patent No. **202,424**, dated April 16, 1878; application filed September 21, 1877.

To all whom it may concern:

Be it known that I, AUSTIN ELLIOTT, of the town of Warrensburg, in the county of Johnson and State of Missouri, have invented a new and useful Spark-Arrester, of which the following is a specification:

My invention is an improvement in spark-arresters as applied to smoke-stacks connecting the furnaces of steam-boilers, but more particularly to those of locomotive-engines.

It consists, principally, in a series of plates cut as from cone-frustums, and set radially about the axis of the smoke-stack of a locomotive-engine, at the obtuse angle formed at the upper section of said smoke-stack, to form deflectors to the cinders and sparks coming from the furnace. These curved plates are arranged in sets, one above the other, and terminate with a perforated cylinder, which sets over and forms a continuation of the still-draft flue.

My invention consists, also, in a flaring-mouthed still-draft flue, provided with a ring or flange on its outer edge, which, together with the device above mentioned, arrests cinders, &c., and causes them to return to the furnace, as hereinafter described.

In the accompanying drawings, Figure 1 is a vertical central section through smoke-stack. Fig. 2 is a top view of same, with the top part of upper section removed to exhibit the arrangement of the conical plates and cylinder with which they terminate. Fig. 3 shows a plan view, (looking upward,) to show the several flues of the smoke-stack. Fig. 4 is a vertical section, showing the relation between smoke-stack and lower arrangements connecting with it.

Similar reference-letters denote like parts in all of the figures.

The smoke-stack containing my improvements is placed at the customary location over front end of furnace, and communicating with steam-chests by pipes, through which pass the exhaust-steam. These pipes from the steam-chests enter into pipes on either side of the still-draft flue, which convey the steam upward, to create a strong draft in the direction of the spark-arrester. Coal and cinder pipes are provided, to connect the space at the end of the boiler with the smoke-stack.

The smoke-stack and spark-arrester attachments may be described in detail as follows: C is the still-draft flue, which terminates at the top with a flaring mouth, W. At the outer edge of this flaring mouth is an annular ring or flange, (which may be arranged for adjustment,) which is to serve as a check to sparks, cinders, &c., flying upward from the furnace. A second cylinder, B′, outside of C, has a diameter sufficient within which to provide space for the steam or exhaust pipes B, connecting with steam-chests by pipes previously described. This cylinder B′ terminates just above the point where the still-draft flue begins to flare. The jacket of the smoke-stack has the usual form, terminating with the double conical top. The space between the cylinder B′ and the smoke-stack jacket communicates with the furnace by pipes, which conduct the falling cinders, &c., to it. Within the jacket, at point P, is an annular flange, extending downward, which, together with a corresponding flange opposite on the outside of cylinder B′, serves to form a lodging-place for the returning cinders, &c., previous to being precipitated by gravity to the chest below provided for it. D D are double series of curved sheets, radially arranged about the perforated cylinder E, which is located immediately above the mouth of the still-draft flue C. The sheets D, which form the most important part of my spark-arrester, are arranged with reference to each other in their respective series so as to break joints, spaces being left between them vertically and horizontally barely sufficient for draft purposes. The sets are joined together on their periphery by a cylindrical plate, which is fastened to the smoke-stack jacket at the point shown in drawings. The under side of the ring containing these conical plates is covered with wire-gauze or its equivalent.

The flue C, when the engine is not in action, serves to carry the products of combustion upward without obstruction. When the engine is in motion, the sparks, &c., which come from the furnace *b b* pass through the steam-draft flue B″, being impelled upward by the artificial draft caused by the exhaust-steam, are deflected by the flaring mouth of still-draft flue C toward the ring or flange K

K, and are in part arrested and thrown downward to the point P. The steam and the remainder of the sparks and cinders not checked at K pass through the openings in the gauze at N M toward the conical plates D D, where they are deflected toward A through the said gauze, and also through the openings in the cylinder E, those falling within the mouth W finding their way to the furnace by way of the still-draft flue.

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

1. In a spark-arrester for steam-engines, the smoke-stack as described, when composed of the still-draft flue C, the flue B″, and steam-pipes B, in combination with the smoke-stack jacket, all substantially as and for the purpose set forth.

2. The still-draft flue C, having at the outer edge of its mouth the ring or flange K, forming the cinder-check, in combination with flue B″, as and for the purpose set forth.

3. The spark-arrester formed of the curved plates D D, joined by an annular plate on their outer edges, and terminating inward with the perforated cylinder E, as and for the purpose set forth.

4. In a smoke-stack for steam-engines, the still-draft flue C, provided with ring or flange K, the steam-draft flue B″, the jacket of smoke-stack, and spark-arrester D D, all combined and arranged as described, for the purpose set forth.

AUSTIN ELLIOTT.

Witnesses:
G. C. LAND,
WM. E. CRISSEY.